

Toward Developing the Guidance on National Long-term Roadmap to Synergise Mitigation and Adaptation in ASEAN Countries



Profile

The Institute for Global Environmental Strategies (IGES) was established in March 1998 under an initiative of the Japanese government and with the support of Kanagawa Prefecture. The aim of the Institute is to achieve a new paradigm for civilization and conduct innovative policy development and strategic research for environmental measures, reflecting the results of research into political decisions for realising sustainable development both in the Asia-Pacific region and globally.

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Toward Developing the Guidance on National Long-term Roadmap to Synergise Mitigation and Adaptation in ASEAN Countries: Workshop Proceedings

29 March 2023 (online)

9:00-16:10 (GMT+7)



Workshop participants

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Glossary

AAP	AWGCC Action Plan
ACCSAP	ASEAN Climate Change Strategic Action Plan 2023-2030
ACB	ASEAN Centre for Biodiversity
ACE	ASEAN Centre for Energy
AIM	Asian-Pacific Integrated Model
AP-PLAT	Asia-Pacific Climate Change Adaptation Information Platform
ASCCR	ASEAN State of Climate Change Report
AWGCC	ASEAN Working Group on Climate Change
CRDP	Climate Resilient Development Pathway
CYJ	Climate Youth Japan
GHG	Greenhouse Gas
ICU	International Christian University
IGES	Institute for Global Environmental Strategies
IMHEN	Vietnam Institute of Meteorology, Hydrology and Climate Change
IPB	Institut Pertanian Bogor
MASA	Institut Masa Depan Malaysia
MUFG	MUFG Bank, Ltd.
LoCARNet	Low Carbon Asia Research Network
NIES	National Institute for Environmental Studies
SIIT-TU	Sirindhorn International Institute of Technology, Thammasat University
UNFCCC	United Nations Framework Convention on Climate Change
UPLB	University of the Philippines Los Baños

Executive Summary

Background and Objectives

Since the 26th Conference of Parties (COP26) of the United Nations Framework Convention on Climate Change (UNFCCC) in 2021, global society, including Asian countries, has entered the phase of how to implement a long-term transition roadmap to net-zero greenhouse gas emissions (GHGs). Given vital needs for the development in many Asian countries, a transition toward net-zero emissions needs stronger synergies of climate resilience and low carbon development. To this end, a workable long-term roadmap is essential to provide clear signals for the markets and citizens to mobilise finance for the development and diffusion of key technologies. Such a roadmap will greatly help achieve multi-dimensional transformation of the society that is necessary for the transition toward a resilient net-zero world. It is thus vital to involve stakeholders of, among others, governments, scientists, business/industries and youth to make a long-term roadmap more effective and inclusive.

The Chairman's statement of the 25th ASEAN-Japan Summit held on 12 November 2022 states that ASEAN welcomed Japan's support for the development of the ASEAN Climate Change Strategic Action Plan 2025-2030 (ACCSAP) to achieve the prioritized actions until 2030 that were identified in the ASEAN State of Climate Change Report (ASCCR), and further encouraged Japan's support for the establishment of the ASEAN Centre for Climate Change in Brunei Darussalam. The ACCSAP is expected to be a reference of regional strategy for climate change to facilitate the implementation of climate actions toward ASEAN's long-term climate aspiration.

The ACCSAP, a regional climate change blueprint until 2030, aims to generate stronger synergies by more effective cross-sectoral coordination or integration among key sectors, such as energy, agriculture and forestry, transport, infrastructure, disaster risk reduction and finance. National targets and actions elaborated in the Nationally Determined Contributions (NDCs) will surely serve as the basis of the regional climate change countermeasures covering mitigation and adaptation. From the long-term perspective, it is necessary to further address the synergy between mitigation and adaptation, and the development of science-based policies to design a more feasible and effective roadmap for the society transformation in a sustainable manner.

With such a background, this workshop aimed to conduct a scoping of the new project with various stakeholders in the ASEAN region and beyond. The first day (Day 1: 29 March 2023) focused on the scoping of a study on the guidance of national long-term (2050 and beyond) roadmap that synergises mitigation and adaptation to achieve a resilient net-zero society in ASEAN. Day 1 invited various stakeholders from national governments, think-tanks, business/industries, and youth groups to understand their opinions and expectations for the long-term roadmap development. The second day (Day 2) conducted a closed consultation meeting on the ASEAN's Climate Change Strategic Action Plan 2025-2030 (ACCSAP), with a focus on its purpose, scope, and overall implementation plan by stocktaking the current situation and needs in the region.

The present proceedings report key findings from Day 1.

Findings in the Workshop

Four sessions (Government, Think-tank, Business/ Industry, and Youth) plus one discussion session have uncovered the current status and gaps / opportunities of research and policy with regard to long-term transition to synergise mitigation and adaptation in ASEAN contexts.

This Scoping Workshop was an important first step to identify the research scope that is really necessary now in the ASEAN region to develop a guidance on national long-term roadmap to synergise mitigation and adaptation by the year 2025. Integration of mitigation and adaptation is of a fundamental need in the ASEAN region as well as the rest of the world, but there has yet to be a comprehensive study to translate scientific findings into a practical usable national roadmap, which is key to scaling up good practices on the ground and local communities or invent new approaches enabling systematic integration of separate sectors. For this purpose, the findings of the project will also be reflected in the ASEAN Climate Change Strategic Action Plan 2025-2030 (ACCSAP), expectedly generating wider impact over the ASEAN region.

To this end, this Workshop invited four indicative stakeholders from target ASEAN countries, i.e., government, think-tank, business/industry, and youth, and discussed the expectations or suggestions about the purpose, scope and methodology of overall framework of long-term roadmap. It was confirmed that different perspectives and voices from various stakeholders across ASEAN countries together form the ground and direction of this aspirational research project.

Their continuous engagement will also be the basis of implementation phase to enable long-term resilient net-zero transition. Key findings or suggestions in the Workshop are summarised as follows.

- The current world systems (including hard infrastructures and soft infrastructures such as institutions and legal frameworks) were not made by the current youth people. Youth's continuous involvement is the most important factor to inject a transformative perspective into the design of the national long-term roadmap, resulting in avoiding lock-in of socio-ecological systems. Students, youth-led organisations and youth professional workers are key players to facilitate multi-stakeholder engagement, as youth people are in an advantageous position to build stronger ties with other sectors or areas and to co-create a shared value for distant future. New (not locked-in) perspectives flowing from youth people's mind will be affecting existing socio-ecological paradigms, including national *vision*, *climate goals*, and *transition pathways*.
- In designing *transition pathways* (roadmaps), i) *societal or developmental visions*¹ and ii) *climate goals* of a resilient net-zero country should be understood well. This is because i) and ii) will affect the patterns of long-term pathways, potentially generating a wide variety of roadmaps across ASEAN countries. For example, regarding ii), specific goals of what kind of net-zero energy system (including decarbonisation technology) should be achieved is still very uncertain (e.g. whether a future of complete renewable energy is

¹ For example, the "Bio-Circular-Green Economy" model or "Sufficiency Economy Philosophy" in Thailand (Please see Section 3.3).

pursued as an ultimate goal; and energy mix of abated fossil fuel power, hydrogen/ammonia and distributed renewable power in a target year). Thus, understanding what kind of net-zero goal is assumed is a vital first step to specify a resilient net-zero transition.

- Following the identification of the range (uncertainty) of climate goals, detailed critical factors and conditions for clean energy transition (e.g. phasedown or phaseout of fossil fuel power; and diffusion and mainstreaming of renewable energy) need to be understood by means of evaluation frameworks with detailed criteria including technological (e.g. reliability), economic (e.g. affordability), social, and environmental (e.g. emission reduction) aspects. Evaluation frameworks of the nexus between clean energy transition and resilience or adaptation areas give a connection point of mitigation and adaptation. Evaluation frameworks of policy, institutions, or specific actions can provide necessary and sufficient conditions for a resilient net-zero transition pathway based on scientific criteria some of which may be properly monitored by stakeholders. Identification of timeframe of transition (e.g. interim step and final goal; and until 2030 and net-zero year) will help stakeholders translate into practical actions.
- Generation of adaptation synergy in mitigation transition may be able to promote just and orderly transition, integrating mitigation and adaptation transitions in a sustainable and inclusive manner. This is because resilience and adaptation to climate change can enhance energy and social stability, a central concept of

just and orderly transition. This kind of knowledge to integrate mitigation and adaptation transition is worth being shared with stakeholders involved in transition finance (e.g. taxonomies) in ASEAN. This can be a good opportunity to mobilise finance towards the goal of resilient net-zero transition in ASEAN.

- Adaptation to climate change requires a spatially distributed decision making by local communities. At the same time, mitigation also requires consideration of impact on the local stakeholders and communities. Especially, distributed renewable energy such as solar PV, wind, and biomass have a potentially huge impact on land use, including biodiversity. Starting from the potential of renewable energy, understanding of its impact on resilience of local communities will provide clear linkages between net-zero mitigation transition and adaptation transition. Resilience factors which are relevant to exposure and vulnerability (adaptive capacity and sensitivity) need to be considered: for example, institution/governance, infrastructure, land-use, nature conservation, city structure, local / vulnerable people, socio-economic changes, industrial structure, and demography. It was also discussed that youth-led climate movement (including education or research) at a local level can promote deeper system integration of mitigation and adaptation
- Target ASEAN countries (Indonesia, the Philippines, and Thailand²) have various policy and institutional frameworks and networks to enable a resilient net-zero transition, or a net-zero “climate resilient development pathway”

² The 2nd “Thailand Climate Action Conference” (TCAC) to be held in mid-2023 will aim to balance mitigation and adaptation actions.

(CRDP). There are wide cross-country variations in national developmental vision, vulnerability to climate change, priority of adaptation over mitigation, scientific capacity to model GHG emission pathways or climate risks and vulnerability, governance structure, etc. Therefore, there is an immense potential for learning and capacity development by collaboration of multi-stakeholders in ASEAN and outside (e.g. Japan and other countries). Ongoing processes of revising or updating climate national policy documents provide rich lessons for the design of macro-frame of national roadmap which allows for adaptive and flexible transition towards a long-term goal, a necessary condition of well-designed CRDP.

- Stock-taking of the efficacy and lessons of ongoing in-country and international scientific research projects (e.g. LoCARNet for mitigation, and AP-PLAT for adaptation) is a vital step toward a more rigorous science-based policy making synergising mitigation and adaptation. Moreover, a perspective to link not only “science and policy” but also “science and communities” is pivotal for a mitigation-adaptation integrated transition. We need to narrow down the gap between community and science-based climate change projects and programmes. Community’s aspect needs to be incorporated in the national long-term roadmap.
- Agriculture is fundamentally important to ASEAN countries for ensuring food security and economic prosperity. Many small farmers are often very vulnerable to climate change, and thus involvement of vulnerable communities including farmers, women, and children should be carefully considered in developing national long-term roadmap to synergise mitigation and adaptation in the agriculture sector.

- All stakeholders involved in long-term roadmap development need to answer the question of “How to make the pathways (roadmaps) to be usable and doable”, considering the fact that the pathways published by the academia are often difficult to use in a practical manner. For this, it should be recognised that i) long-term pathways are diverse and uncertain by nature, and that ii) usability by private (e.g. financial) sectors need to be well defined and understood by proper consultations. For i) and ii), it is important to formulate an iterative approach as a part of long-term roadmap development to ensure an adaptive process of resilient net-zero transition, while ensuring science-based policy making in terms of long-term projections and monitoring and facilitating learning of all stakeholders including government, think-tank, business/industry and youth. This will create an enabling condition for ASEAN countries to promote a net-zero climate resilient development toward their long-term goals.

Way Forward

This Scoping Workshop served as such as an opportunity to discuss the scope and fundamental methodologies for national long-term roadmap synergising mitigation and adaptation. As a way forward, the present project will be implemented in parallel with the ACCSAP to generate synergies with development of the ASEAN regional climate strategy. The 2nd Workshop is planned in March 2024 to discuss the preliminary results of individual analyses, and the 3rd Workshop is planned in early 2025. The output of the “Guidance on the National Long-term Roadmap to Synergise Mitigation and Adaptation” is scheduled to be published by March 2025.

1. Introduction: Framing Presentation

1.1. Long-term Roadmap for Mitigation-Adaptation Integration

“Toward Developing a Long-term Roadmap Integrating Mitigation and Adaptation” led by Sub-theme I (STI)

Yosuke Arino, IGES, Japan

On behalf of team members, Dr. Yosuke Arino at IGES reported the project’s overall implementation plan, with a focus on its background, objectives, and methodology to integrate mitigation and adaptation transitions in ASEAN countries.

As a background, political processes up to now were highlighted. The ASEAN State of Climate Change Report (ASCCR) was published in October 2021 and its key message for ASEAN to achieve net-zero transition was mentioned by the Secretary General of the ASEAN at the 26th Conference of Parties (COP). Through the 16th ASEAN-Japan Dialogue on Environmental Cooperation on 6 October 2022, development of the ACCSAP was welcomed in the Chairman’s Statement of the 25th ASEAN-JAPAN Summit on 12 November 2022. These processes showed the linkage of the present research project with the ACCSAP, an ASEAN’s climate change strategy until 2030.

It is noteworthy that the ASEAN climate vision 2050 shown in ASCCR presented ASEAN’s long-term goal to synergise mitigation and adaptation. It states

that “[w]herever possible, adaptation interventions should aim for synergy with mitigation transition in order to drive the ASEAN transformative pathway toward resilient net-zero emissions. For this purpose, climate change adaptation and mitigation need to be integrated using cost-effective solutions that maximise well-being.”

Given this ASEAN’s context, this research project aims to i) jointly develop a “Guidance” for the development of a long-term roadmap for achieving climate-neutral and resilient societies in major ASEAN countries; and ii) identify critical elements (social, economic, institutional, land use, etc.), indicators and transition mechanisms for implementation of transition to maximise synergies between mitigation and adaptation. Outcome includes, but is not limited to, developing or updating Long-Term Strategies (LTS), Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), NDC Roadmaps, Sectoral policies (e.g., energy, agriculture, forestry, and other land use) and ASEAN Taxonomy in a manner mitigation and adaptation are synergized to a resilient net-zero country or region. This goal of synergizing net-zero mitigation and adaptation is in line with the “ASEAN climate vision 2050” shown in the ASCCR (Section 4). The overall research question to be answered is how to achieve a transition by synergizing mitigation and adaptation in the ASEAN contexts.

The general approach (Figure 1) is, first, to identify key characteristics of mitigation transition to net-zero emissions, and then to assess the transition’s potential impacts on resilience or adaptation issues. In doing so, key factors for enabling a “resilient net-zero transition” will be identified. The final output the “Guidance” will summarise all research outputs and show a practical roadmap utilised in ASEAN countries and region.

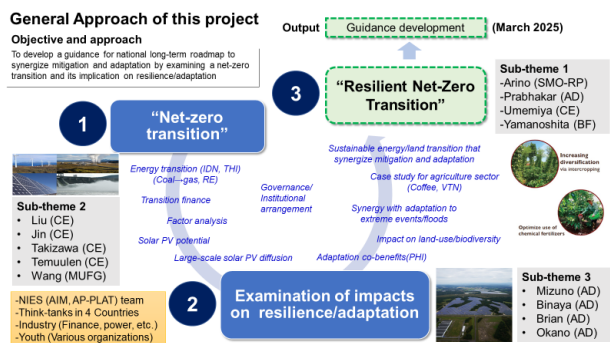


Figure 1. General Approach of the Project

1.2. Net-Zero Transition

“Mitigation Measures Centering on the Promotion of Renewable Energy Diffusion toward Climate Neutrality” led by Sub-theme 2 (ST2)

Xianbing Liu, IGES, Japan

On behalf of the team members, Dr. Xianbing Liu at IGES reported the research plan of sub-theme 2 (ST2), namely ‘Mitigation Measures Centering on the Promotion of Renewable Energy Diffusion toward Climate Neutrality’.

The sub-theme of mitigation focuses on energy transition in the target ASEAN countries due to its central role for achieving a carbon neutral and resilient society. Energy sector is also a key area for the discussions of synergy and/or tradeoff of mitigation and adaptation. In spite of the consensus about the forecast of future energy and electricity demand of ASEAN, the previous literatures proposed various options for realizing a decarbonized energy mix at the supply side. Different with the macro-model and scenario studies, this research aims to discuss the feasibility

and practical ways for energy transition in ASEAN by conducting a series of empirical analyses.

The research contents cover the diffusion and mainstreaming of renewable energy on the one hand, and the phasedown or phaseout of fossil fuel power on the other hand. Another topic is about the development trend of key technology options (i.e., hydrogen, CCUS and cross-country power grid) and their potential role in supporting energy transition of the target ASEAN countries.

For the maximum expansion of renewable energies, the potentials for their future development will be quantitatively estimated by considering various factors like population change, land use limitation, long-term impact of global warming and so on. Based on the review of status-quo of renewable energy policies and the grouping of determinants, key drivers and barriers will be specified in order to clarify the promotion mechanism for renewable energy diffusion. It is generally necessary to reduce capital cost for promoting renewable energy in ASEAN developing countries. The research may clarify the factors of capital cost and propose measures to reduce the cost for the matching of renewable financing schemes and the projects.

Referring to the existing literature, the project team members will develop a comprehensive framework for the evaluation of coal-fired power plant retrofit and early retirement in ASEAN. Various aspects, such as technological, economic, social, environmental and country and system specific features, will be covered for the ranking of power units at the phasedown or phaseout planning stage. For the actual implementation, not only full retirement but also unit retrofit may be considered as the practical options. The financing measures may be further discussed by linking with available initiatives like the Just Energy Transition Partnership (JETP) and Energy Transition Mechanism (ETM).

In the cases where and/or when the access to affordable renewable energy is constrained, it is an option to shift from gas-fired power generation to hydrogen power generation due to their high similarity in technology and facilities. It is thus meaningful to discuss conditions and policy measures for hydrogen to have a comparative advantage over natural gas in ASEAN, i.e., by hydrogen cost reduction, carbon tax on natural gas, etc.

An additional analysis is the preferred institutional arrangement (IA) to facilitate large-scale expansion of renewable energy (i.e., solar PV) in the target ASEAN countries. The approach is to first specify the essential elements, i.e., coordination within government, regulatory framework, stakeholder participation and necessary resources. The gaps, barriers and opportunities can be then discussed by integrating the relevant elements into various stages of a policy cycle, such as planning and development, implementation, monitoring and reviewing, evaluation and feedback. Best practices in developed countries may be referred and learned for policy recommendation to enhance the institutional arrangement in the target ASEAN countries.

1.3. Resilient Net-Zero Transition

“Adaptation Measures for Adaptation-Mitigation Synergies” led by Sub-theme 3 (ST3)

Osamu Mizuno, IGES, Japan

On behalf of the team members, Mr. Osamu Mizuno at IGES reported the research plan of sub-theme 3 (ST3), namely ‘Adaptation Measures for Adaptation-Mitigation Synergies’.

He explained that ST3 had three components. The first component was the Resilient Transition to Carbon Neutrality and its guiding research question was, “How can we make the resilient transition to carbon neutrality possible?” There were three sub-components under this guiding question, which are 1) 1.1: Analysis of the impact of the carbon-neutral energy system on the resilience of the society, community, etc., 2) 1.2: Analysis of the resilience of the carbon-neutral energy system to the climate risks, 3) 1.3: Formulation of adaptation measures in target countries based on the analysis of 1.1 and 1.2. He explained the relevance of these questions by introducing some examples of the challenges and possible solutions.

The second component was Sectors/aspects of adaptation policies for a long-term roadmap. The guiding research question for this component was, “How can adaptation interventions contribute towards transitioning to a resilient and carbon-neutral development?” This component also had three sub-components, which were 1) 2.1: Identifying the aspects, sectors, and processes of adaptation that can be integrated into the concept of the “long-term roadmap” towards transitioning to resilient and carbon-neutral development. 2) 2.2: Analyze key adaptation sectors/aspects and their contributions to net-zero transition. 3) 2.3: Prioritizing technologies/measures/processes of adaptation to be incorporated into long-term roadmaps. He explained with examples that there were various risk sectors and various adaptation options.

The third component was Resilient transition strategies for the roadmap development. The guiding research question for this component was, “How can countries develop a useful ‘long-term roadmap’ for resilient transition?” This component had two sub-components, which were 1) 3.1: Develop resilient transition strategies coupled with

RE and energy efficiency for their integration into a long-term roadmap, 2) 3.2: Formulate an iterative approach, such as PDCA cycle, as a part of long-term roadmap development to ensure an adaptive process of resilient transition.

Then he explained the methodology for the research and the expected outcomes. He stressed that there were many ongoing efforts on adaptation in the targeted countries and the research aimed at producing added value on them without duplications and inconsistencies. ST3 would explore deploying a co-development approach with the relevant stakeholders as much as possible.



2. Government (Session 1)

2.1. Overview of Session

Highlights of the current key national policy on mitigation, adaptation, and integrated areas, and the expectations for the longterm roadmap toward a resilient net-zero country based on national development vision

Binaya Raj Shivakoti, IGES, Japan

Temuulen Murun, Policy Researcher from IGES shared different views of governance and institutional arrangement and the process for the formulation of institutional setups around climate change policies and actions. Governance and institutions underpin mitigation and adaptation actions by providing legal basis to setup implementing organization. The role of government and institutional arrangements and capacity are one of the enabling conditions to move toward climate resilient net-zero development pathways. She introduced elements of institutional arrangements highlighting important functions such as the horizontal and vertical integration across government institutions, stakeholder engagement, strong monitoring and evaluation within the policy cycle management, and right regulatory framework and clear mandates to facilitate the transition. For realising these functions, resource such as financial, technological, human and data/information, are critical as the lack of resources is one of the key challenge for the implementing climate actions, especially, in the developing countries.

Suriwassa Thanyanattawit, Office of Natural Resources and Environmental Policy and Planning (ONEP), Thailand ONEP, MONRE, introduced Thailand climate change (CC) policy landscape. She shared the Vision 2050 of Thailand's Climate Change Master Plan 2015-2050 which focuses on three main strategies (mitigation, adaptation, and enabling environment) in order to realise resilience to CC impacts while achieving the low carbon growth through sustainable development. The master plan focuses on six sectors for adaptation and eight sectoral cooperation for mitigation. The enabling environment which supports to operationalize adaptation and mitigation priorities in various ways. These include research and technology, CC local knowledge and public awareness, CC implementation mechanisms and international collaboration and cooperation. She introduced six vulnerable sectors, namely water resources, agriculture, tourism, public health, natural resources and settlement, identified in the National Adaptation Plan (NAP). NAP has a mission to address identified vulnerability by building resilience, empowerment and awareness raising of development partners and develop knowledge, database and application of technologies.

On mitigation, H.E. General and Prime Minister Prayut Chan-O-Cha at the world leaders' summit at the United Nations Framework Convention on Climate Change (UNFCCC) committed Thailand willingness to move more aggressively using all available means to reach carbon neutrality by 2050, and achieve net-zero GHG emission before 2065. Thailand can increase NDC ambition to reduce GHG emission by 40% by 2030 though international cooperation, technology transfer and access to climate finance. For realising the ambition Thailand has identified energy and transport, industrial, waste, agriculture and forestry sectors. Thailand is expected to increase renewable energy to 45%

within 2030 and close to 80% by 2065 while phasing out coal, electrification of transport, promotion of hydrogen reducing emission from new rice cultivating practices and improved livestock feeds, and absorption of 120 MtCO₂ per year from forestry. Thailand will promote alternative energy production and consumption as well as increase energy use efficiency such as use of EVs, hydraulic cement, waste to energy, production of biogas from manure. She then shared a comprehensive overview of institutional mechanism, seven sub-committees, and key mandates that covers policy and planning, knowledge and database, CC laws, public relations, carbon trading, facilitate technology application and international negotiation and cooperation.

2.2. Governance

Introductory presentation on Governance and Institutional arrangements

Temuulen Murun, IGES, Japan

The presentation highlighted the importance of governance and institutional arrangements in implementing climate actions toward climate resilient net-zero pathway. It explained how institutional arrangements and governance underpin mitigation and adaptation actions by providing the legal basis, setting up implementing organizations and developing frameworks with stakeholders. Therefore, these can be one of enablers or barriers to achieve a climate resilient development.

Although individual country's approaches on designing institution structures are diverse, there are key elements to establish and enhance institutional arrangements. These key elements are

coordination (e.g., horizontal and vertical), stakeholder engagement (e.g., academia, private sectors, civil societies), policy cycle management (e.g., planning, developing, implementing, monitoring, evaluating), and regulatory framework (e.g., national laws). In addition to these elements, human, financial and technical resources are needed for strong governance and institutional arrangements to function effectively.

Expanding renewable energy like solar PV with strong adaptation benefits in ASEAN member countries would require better national and sub-national coordination, stakeholder's participation, local community engagement, and appropriate policy development based on scientific data and modeling.

2.3. Thailand's case

Thailand's Climate Change Policies Landscape – from our talks to our walks

**Suriwassa Thanyanattawit,
Office of Natural Resources and
Environmental Policy and Planning (ONEP),
Ministry of Natural Resources and
Environment, Thailand**

Introduction

Climate change is a global challenge that requires international cooperation and actions. The UNFCCC is a fundamental and most important international framework to address this common concern. As a responsible member of the global community, Thailand became a Party to the UNFCCC in 1994, and subsequently ratified the Kyoto Protocol in 2002 and Paris Agreement in 2016. The Ministry of Natural Resources and

Environment (MNRE) by the Office of Natural Resources and Environmental Policy and Planning (ONEP) is operating as the national focal point to the UNFCCC. Figure 2 provides Climate Change Policies Landscape of Thailand, aiming at providing general understanding to see the Climate Change trajectory in this country.

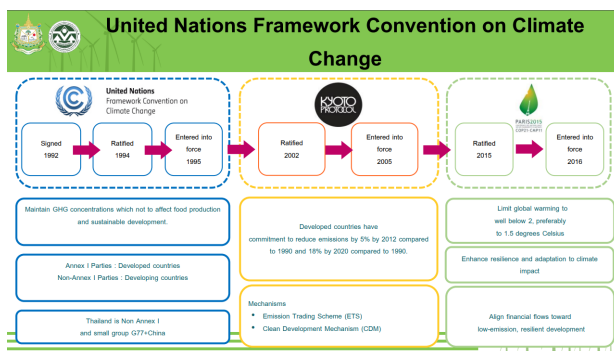


Figure 2. Climate Change Policies Landscape of Thailand

Thailand's GHG Emissions

Referring to our LTS that was submitted before COP26, Thailand recognizes the urgency of climate change situation, through available scientific evidence and taking into consideration the international support by partnered to facilitate Thailand in reaching its Carbon Neutrality and Net Zero GHG Emissions sooner, the Prime Minister decided to enhance our ambition target. At COP26, Our Prime Minister, General Prayut Chan-O-Cha joined other 120 leaders at the World Leaders Summit, in which he announced Thailand's ambitious targets to reach its Carbon Neutrality by 2050, Net Zero GHG Emissions by 2065 as well as intending to enhance its updated NDC target to 40% in 2030 upon adequate international support on finance, technology and capacity-building.

Raising climate ambition

To accomplish these three aforementioned targets, Thailand has promoted the Bio-Circular-Green Economy (BCG) as the national economic development model to mobilize country's inclusive and sustainable growth. In this connection, the Ministry of Natural Resources and Environment has also established the BCG conceptual framework (2022-2027) and corresponding Implementation plan comprising six goals including a comprehensive and conclusive natural resources database for all targeted areas, a national green area increment to 55 percent, an expansion and market penetration of certified eco-friendly products and services, a reduction of resources consumption by one-fourth, a full recycle of all targeted plastic items, and a rapid reduction of GHG emissions compared to business as usual.

Thailand fully embraced the "Sufficiency Economy Philosophy," pioneered by His Late Majesty King Rama 9, as the core guiding principle, particularly to promote climate-resilient communities. Moreover, Thailand is actively promoting the Bio-Circular-Green Economic Model. As the host of APEC in 2022, its key outcome "the Bangkok Goals on BCG Economy" will help synergize cooperation for sustainable growth, climate actions, biodiversity conservation, and waste management.

Thailand's progress on climate change

Climate Change Master Plan (CCMP) 2015 – 2050

Thailand has formulated the Climate Change Master Plan (CCMP) 2015 – 2050 as the national framework for stakeholder which aims to guide the country's long-term action on climate change. The CCMP consists of three key strategies including climate change mitigation, adaptation, and enabling environment for climate change management; capacity building / Technology / mechanism /

cooperation. Thailand is now in the process of revising the Climate Change Master Plan in order to align with the updated NDC/LTS target, national circumstance, and global actions such as the Paris Agreement and Sustainable Development Goals (SDG).

- Mitigation

Thailand has revised its Long-Term Low greenhouse gas Emission Development Strategies (LT-LEDS) and 2nd updated Nationally Determined Contribution (NDC) to be in alignment with the announcement made by Prime Minister at COP26. These documents have been submitted to the UNFCCC secretariat at COP27. Thailand's LT-LEDS lays out a plan for mitigation actions by key sectors, including in energy, transport, industry, waste, agriculture and forestry, to achieve 2050 carbon neutrality and 2065 net zero GHG targets, while Thailand's NDC has been revised to 30-40% GHG emission reduction from 2030 Business-As-Usual (BAU), including measures in energy, transport, industry, waste and agriculture.

- Adaptation

Since COP26, Thailand's efforts have been successful in enhancing country's climate ambition in terms of mitigation efforts, and we will continue to lay out concrete roadmap and partnership for mitigation action. However, as Thailand is a highly vulnerable country, it also needs to enhance its action plans towards climate resilience. The National Adaptation Plan (NAP) identified 6 vulnerable sectors includes water, agriculture and food security, tourism, natural resources, human settlement and security, and health sector.

- Risk Map

With regards to the enhancement of the adaptation information, the Office of Natural Resources and Environmental Policy and Planning (ONEP) has

established the Climate Change Risk Maps Database System which aims to be used for sectoral climate risk planning in the area, for supporting policy decisions making and integrating climate change into the agency's plans, as well as to serve as a channel to build public awareness in a concrete and easily accessible way. The database system can provide maps and information such as Future Climate Projection, Climate Hazard, Non-Climate index, Climate Risk in sectors.

Thailand Climate Action Conference (TCAC)

The Ministry of Natural Resources and Environment (MNRE) in cooperation with key private sectors has organized the first "Thailand Climate Action Conference or TCAC" on 5-6 of August 2022 to address and raise public awareness on the urgency of climate actions. The conference was chaired by Prime Minister, General Prayut Chan-O-Cha with more than 4,500 attendances onsite and online from all sectors, such as, ambassadors, provincial governors, government representatives, international organizations, business leaders, NGOs, civil society, and youth representatives. The conference not only demonstrated Thailand's strong commitment to tackle climate change but also showcased, strengthened, and consolidated sector-wide mutual collaboration on this issue. Private sector has also shown robust contributions in accelerating the race to Carbon Neutrality and Net-Zero GHG Emissions by setting ambitious emission reduction targets within their operations and throughout its value chains. The 2nd TCAC is planned to be held in mid-2023 with the aim to balance between mitigation and adaptation actions, to ensure the execution of plans into action, as well as to promote green finance and investment into solid ground.

Climate Change and Biodiversity Coordination Centre (CCCCB)

Thailand established the Climate Change and Biodiversity Coordination Centre (CCCCB) in the central and provincial areas, with the primary mission of providing information services, advice, suggestions, and an exchange of ideas for climate change and biodiversity action. The concepts are identified as follows:

1. **Communication:** Conveying and enhancing knowledge and understanding about climate change and biodiversity in order to raise wide awareness in all sectors, particularly the public sector, for everyday behaviour change.
2. **Coordination:** Collaborating to link climate change and biodiversity operations with government agencies inside and outside the Ministry of Natural Resources and Environment, as well as the private sector, development organisations, civil society, and the people's sector.
3. **Creation:** Encouraging and supporting the integration of climate change and biodiversity operations into provincial activities, including greenhouse gas reduction, recovery, and accounting. Climate change adaptation includes approaches to natural resource and environmental management that are related or linked.
4. **Capacity Building:** Empowering individuals within the Ministry of Natural Resources and Environment and other agencies at the central, regional, and local levels. In addition, low-carbon development will be prototyped and scaled up to include other participating organisations.



3. Think-tank (Session 2)

3.1. Overview of Session

“Highlights from scientific communities on mitigation, adaptation, or integrated area & expectations for the long-term roadmap toward a resilient net-zero country”

Yosuke Arino, IGES, Japan

This session presented new findings and suggestions from scientific communities for the development of long-term roadmap to synergise net-zero mitigation and adaptation. It is worth noting that this session became the initial dialogue toward integrating mitigation and adaptation transitions in the ASEAN context.

The first presenter, Dr. Rizaldi Boer, showed the significance and challenges of achieving peaking of GHG emissions by 2030 at the global level and in developing countries, and stressed the role of new and renewable energy (spearheaded by solar PV) in national energy policy. Then, he provided rich insights on solar energy's multiple benefits of resilience which enable local households or villages to adapt to intensified climate change in the future.

The second presenter, Dr. Damasa Magcale-Macandog, by introducing the Philippines' basic policy frameworks on climate change, highlighted various scientific communities contributing to the purpose of integrating mitigation and adaptation transitions. Moreover, she identified key opportunities for linking “science and policy” and “science and communities” both in terms of adaptation to climate change and disaster risk

reductions. This has rich implications as to how the national and local decision making will be transformed by integration with science.

The third presenter, Dr. Bundit Limmeechokchai, highlighted the significant role that the Asia-Pacific Integrated Model (AIM) has played in Thailand's mitigation policy making since 2009. This scientific foundation resulted in the development of the Thailand's LTS to achieve net-zero emissions by 2050. He also added the importance of climate resilient development, i.e., finding innovative measures and conducting investigation of synergies and trade-offs among mitigation, adaptation, and development.

The fourth presenter, Dr. Toshihiko Masui, explained the significance, achievements and difficulties of development and application of AIM to achieve a desired decarbonised society. He highlighted the importance of interactions or discussions among stakeholders and researchers by using a model as a communication tool to enable experiment with different assumptions, while pointing out the existence of many uncertainties of future society. Thailand's lesson of applying AIM was also introduced, which implies fruitful lessons for other ASEAN countries.

The fifth presenter, Ms. Tomoko Ishikawa, introduced rich experiences of an innovative scientific network for mitigation modelling and policy planning (i.e. LoCARNet). She highlighted how the network has supported countries (e.g. Indonesia, Malaysia, Thailand, and Vietnam) by respecting different circumstances of each country. This experience can be seen the basis or enabling condition to promote science-based mitigation policymaking in Asia.

The last presenter, Ms. Slavka Sakata, introduced a web-based platform on adaptation decision making in Asia-Pacific region (i.e. AP-PLAT). She highlighted

the significance of the platform in terms of scientific information, capacity development, and network to connect diverse stakeholders, and suggested that AP-PLAT can contribute to designing long-term net-zero climate resilient transition roadmap to avoid unsustainable lock-ins.

Notably, this session is considered to be an initial dialogue among two separate innovative networks on mitigation (i.e. LoCARNet) and adaptation (i.e. AP-PLAT). Given the suggestions by all presenters, it is expected that this research project would develop rigorous methodologies to assess, connect, and synergise science-based actions on mitigation and adaptation as a national guidance.

3.2. Indonesia's Case

“Extension of Solar Energy and Its Synergy with Adaptation”

Rizaldi Boer,
Center for Climate Risk and Opportunity
Management, IPB University, Indonesia

Avoiding dangerous effect of climate change, the global emission should reach net zero emission (NZE) by 2050 - this is to limit global warming to 1.5°C. GHG emissions must peak before 2025 at the latest and by 2030 the emission is 43% below the 2019 emission level (IPCC) globally. Timing of peaking emissions is very crucial since all developing countries up to 2030 still increase their emission. Clean energy transition plays a crucial role in meeting the target. Indonesia's LTS includes a scenario of reaching net-zero in 2060 or earlier.

National policy on New and Renewable Energy (EBT) advocates the target of 23% by 2025. The Grand National Energy Strategy (GSEN) has mapped

the capacity to add EBT capacity of 38 GW until 2035. Indonesia is very rich in renewable energy with a potential of more than 400 GW, 50% of it (207.8 GW) is solar energy potential (in RUEN), while the utilization of solar energy itself is currently only around 0.15 GW or 0.08% of its potential.

Solar Rooftop (targeting 2.1 GW by 2030) is a viable option with multiple benefits such as gas/fuel substitution, local employment, green (solar power plant) industry development, and GHG emissions to achieving NDC target. Solar home off-grid system without connecting to the PLN power grid is an important option in villages. Distributed solar systems are applicable in various scenes. Examples include use of solar energy for meeting lighting demand at night in fishing boats, generating multiple benefits: (i) reducing ship operating costs; (ii) maintaining environmental sustainability; (iii) improving sanitation on board; (iv) improving the health of crew members; (v) reducing accidents on ships; (vi) reducing fire events; (vii) improving the security system on the ship; and (viii) providing a sense of security for crew members.



Gambar 2. Pemasangan PLTS

Source: Nugraha et al. (2021)

Solar pumping is being used by many households, which helps them manage clean water shortage for communities with increasing use of spring water, river, ground water. Solar irrigation in rice fields reduces costs spent for diesel pumps, providing

effective solutions for management drought, increasing planting intensity, and boosting yields. Another example show that solar energy helps an ecotourism village by increasing income and reducing poverty and vulnerability.



Source: [Muhamad Fajar Riyandanu \(2022\)](#)

In conclusion, solar energy is abundant in tropical countries but its utilisation is still very low. Notably, extended use of solar energy in urbans and villages is expected to contribute to the process of clean energy transition and climate change adaptation. Solar energy reduces poverty by opening more job opportunities and reducing expenses for energy, while it meets farmers' demands for renewable energy and irrigation water, thereby increasing income and capacity to manage extreme climate (e.g. drought risks). As a result, resiliency is ensured. However, there remains barriers for solar energy installation such as high initial investment and capacity gaps. Therefore, government subsidies, public-private partnership for climate village programmes, awareness raising, technical capacity development for maintenance, and open linkages with carbon markets are vital.

3.3. The Philippines' Case

“Highlights of the current key actions on mitigation, adaptation, and integrated areas, and expectations and desires for the long-term roadmap toward a resilient net-zero country”

Damasa Magcale-Macandog,
University of the Philippines -Los Baños, the Philippines

The Philippines has long been established as the most vulnerable country in terms of the effects of climate change and the disruption that this brings, which severely affects the welfare of Filipinos. Several national laws are enacted in response to these scenarios in the form of long-term mitigation measures or adaptation measures such as amplifying disaster response and risk reduction capabilities which includes; climate change act of 2009. This anticipatory approach enables the country to prepare itself for future disasters and will minimize the impact of future CC-related calamities. The *National Climate Change Action Plan* (NCCAP) focuses on encouraging various sectors to align their commitment to the country's climate change adaptation and mitigation strategies.

Contributions from the scientific communities on mitigation, adaptation, or integrated area include the following research projects or programs: Climate Smart Agriculture, DREAM, Phil-LiDAR, SARAI, UP-NOAH, MODECERA, Vulnerability Assessments, APNIS - Oriental Mindoro Project, Ecological Carrying Capacity Modelling of the 7 lakes of San Pablo City, Education and Information Campaign, and the International Academic Consortium for

Sustainable Cities (IACSC) Collaborative Activities toward Climate-Proof Asian Cities.

Several measures have been implemented in the Philippines to demonstrate the scientific community's dedication to tackling climate change. In 1958, the Science Act, also known as Republic Act No. 2067, created the National Science Development Board (NSDB), with the National Research Council of the Philippines (NRCP) serving as the government's designated scientific consultant, as outlined in Section 20 of the legislation.

Recommendations for linking science and policy for climate change adaptation and disaster risk reduction are the following: integrate the grassroots initiatives of LGUs with centralized coordination from top-level authorities; extend an invitation to the Local Government Unit (LGU) to participate in learning events and presentations; implement the methodology in different locations and adapt it to match the specific scale requirements; training sessions are designed to enhance the capabilities of technical personnel through hands-on workshops with a focus on technical development; and the implementation and standardization of science-based programs bring advantages to the institution.

The expectations from linking science and communities for climate change adaptation and disaster risk reduction include lifestyle changes, active community participation, harness innovation from local knowledge, communicate scientific findings to a platform that the general community have access to and can easily understand, domesticating science-based projects to the community to enable them to continue them by themselves, and narrow down research and community gap.

3.4. Thailand's Case

“Guidance of National Long-term Roadmap to Synergize Mitigation and Adaptation: Thailand”

Bundit Limmeechokchai,
Thammasat University Research Unit in Sustainable Energy and Built Environment,
Sirindhorn International Institute of Technology,
Thammasat University,
Thailand

The Asia-Pacific Integrated Model (AIM) is a large-scale computer simulation model developed by AIM team and lead by the National Institute for Environmental Studies. The AIM assesses policy options for stabilizing the global climate in the Asia-Pacific region, with the goals of reducing greenhouse gas emissions and avoiding the impacts of climate change. In 2009, both Thailand's low carbon society (LCS) scenario and city-level LCS scenarios were developed using AIM/ExSS. In 2012, the AIM/Enduse was first employed in Thailand to explore the peak year of greenhouse gas (GHG) emissions and the possibility of the IPCC two-degree pathways of Thailand. Then, Thailand's Nationally Appropriate Mitigation Action (NAMA) and Nationally Determined Contribution (NDC) had been examined based on the AIM/Enduse approach. Recently, the computable general equilibrium version of AIM, named AIM/CGE, has been employed to assess Thailand's net zero GHG emissions and carbon neutrality by 2050 in its long-term low emission development strategy (LT-LES) to UNFCCC. However, ASEAN countries are facing the drastic changes in climate from increasing GHG emissions. Both mitigation and adaptation measures need to be urgently implemented carefully when synergies and trade-offs are considered. In climate resilient development, we need to find innovative measures and investigate synergies and trade-offs

between adaptation, mitigation, and development. Finally, the long-term roadmap to synergize mitigation and adaptation need to be developed using the AIM Family models.

3.5. AIM Development and Application

“Development and Application of AIM to Realize Decarbonized Society -For Decision Making Based on Scientific Knowledge-”

Toshihiko Masui, National Institute for Environmental Studies (NIES), Japan

In order to realize the 1.5°C target, many countries including ASEAN countries have set net-zero emissions as a long-term emission reduction goal, but it is not easy to show the way to achieve this goal. Models and model simulation results have been supporting to show the pathway through discussions among stakeholders and researchers. AIM (Asia-Pacific Integrated Model) is one of the integrated assessment models and has provided the Ministry of the Environment with simulation results on Japan's net-zero GHG emissions. In addition, we are also working with researchers in Asia to develop various models that reflect the characteristics of each country. In this presentation, the roles of model and the process developing AIM and simulation using AIM were explained.

The future holds many uncertainties, and a variety of different views must be brought together to achieve a desired decarbonized society. Model is a communication tool to connect various stakeholders, and model can be used to experiment

with different assumptions. To get meaningful results from model analysis, stakeholders need to understand the model correctly, the model needs to be transparent and reflect the various opinions of stakeholders. And the model becomes even more meaningful when it is operationalized by the stakeholders in that country.

The AIM team provides ExSS (Extended SnapShot Model), AIM/Enduse, and AIM/CGE to assess the roadmap for achieving a decarbonized society in the target country. And since their own hands-on involvement is key to their countries' development, the AIM team supports researchers in Asia through capacity building on development of these models and scenarios. In Thailand, Thai researchers have developed AIM to assess their own decarbonization pathways and contribute to the creation of long-term strategies. The AIM team wants to support researchers in developing countries through the process of developing AIM and quantifying scenarios.

3.6. LoCARNet Activities

“LoCARNet Activities to Support Bridging Modeling Works with Actions”

Tomoko Ishikawa, IGES, Japan

Low Carbon Asia Research Network (LoCARNet) has supported scientific policymaking in Asian countries with three pillars: capacity building, science and policy dialogue meetings, and knowledge sharing. It has recently been strengthening collaboration with the Asia-Pacific Integrated Model (AIM) project team.

The Japanese Ministry of the Environment, the AIM project team and LoCARNet have supported the development and updating of Nationally Determined Contributions (NDCs) and Long-Term Strategies (LTSs), as well as the development of decarbonization strategies for cities in the Asian region including Japan, through joint research with researchers in-country and training programmes to foster young researchers. Through such support, researchers in Thailand and Indonesia have collaborated with policymakers, and been involved in the deliberation process of NDCs and LTSs. AIM's contributions have been clearly stated in these documents.

In Vietnam, AIM has contributed to the Vietnam's National Climate Change Strategy (NCCS), based on the bilateral agreement between the governments of Viet Nam and Japan.

In Malaysia, AIM is used as the basis for city planning and project implementations, especially in city level. On the other hand, at the national level, our collaboration using AIM has just been started and is still the initial stage – only holding scientific and policy dialogue meetings. It is hoped that our research results will be disseminated to policymakers in the future.

In both Vietnam and Malaysia, the Japanese AIM project team is conducting the calculations, however, in the future, it is expected that researchers in-country should be fostered, and be involved in the policymaking process using their own calculations.

As just seen, as countries in Asia have different circumstances, LoCARNet has worked together with researchers in Asia. It endeavours to promote science-based policymaking in Asia, establish research communities in each country, and build a system that enables these researchers in-

countries to be involved in the policymaking process in their countries.

3.7. AP-PLAT and Its Contribution

AP-PLAT and its potential contribution to the long-term roadmap toward climate-resilient Southeast Asia

Slavka Sakata,
Center for Climate Change Adaptation (CCCA) at the National Institute for Environmental Studies (NIES), Japan

Asia-Pacific Climate Change Adaptation Information Platform (AP-PLAT) is a web-based platform that provides tools, scientific information, and capacity development resources to support science-based decision making and effective climate change adaptation measures in the Asia-Pacific countries (Figure 3). AP-PLAT was established in 2019 and is managed by three entities: the Ministry of Environment Japan (MOEJ), the National Institute for Environmental Studies (NIES), and the Institute for Global Environmental Strategies (IGES).

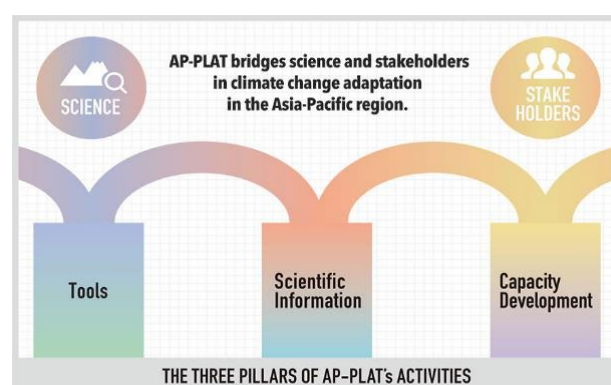


Figure 3. Three Pillars of AP-PLAT Activities

AP-PLAT provides extensive online content and has a network of supporting organizations. As such, AP-PLAT is in a unique position to contribute to the

two goals discussed at the Scoping Meeting: 1) development of a long-term climate-resilient net-zero transition roadmap that avoids unsustainable lock-ins, 2) promoting synergies between adaptation and mitigation in the ASEAN region.

More specifically, AP-PLAT can offer:

- Scientific information and tools for climate projections and impact assessment, such as ClimoCast, H08 Water Risk Tool and Climate Impact Viewer. For example, ClimoCast is an online tool that allows users to check future regional climate projections based on the latest climate data (CMIP6). ClimoCast has an easy-to-use interface that makes climate projections accessible to all individuals regardless of their academic knowledge. Users can compare four major emission scenarios (SSP126-585), compare the results of ten different climate models, and download the corresponding data.
- Capacity development resources, such as E-learning courses available on AP-PLAT website, and training workshops conducted in person and online. For example, E-learning courses include topics such as: Building resilience to Compound and Cascading Disaster Risk; Nature-based solutions for local communities; Climate adaptation and resilience building through sustainable waste and resource management; and other topics.
- Network of supporting organizations and capacity development partner organizations. These represent a diverse spectrum of stakeholders in both geographical and sectoral terms. List of supporting organizations and capacity development partner organizations can be found on AP-PLAT website.

AP-PLAT is ready to utilize its resources to contribute to the development of the long-term

zero-emission roadmap and to promote adaptation-mitigation synergies in the ASEAN countries.



4. Business/Industry (Session 3)

4.1. Overview of Session

“Highlights of the current key actions on mitigation for clean energy transition, and expectations for the long-term roadmap toward a resilient net-zero country”

Xianbing Liu, IGES, Japan

The Business/Industry Session aims to highlight the needs and current practices of the businesses for clean energy transition, and their expectations for the long-term roadmap toward a resilient net-zero society. Two presentations were made by the experts from Japan in this session. The key points of these presentations (4.2 and 4.3) and a summary of Q&A (4.4, authored by Dr. Xianbing Liu) are as follows.

4.2. Japan's Power Sector Initiatives

Japan's Decarbonisation Assistance for the Asian Power Sector to Achieve Net-zero

Hajime Takizawa, IGES, Japan

The presentation briefed current policy of Japan for supporting net-zero in Asia. In particular, Japan pledged to provide 10 billion USD to support Asia's net-zero path in COP26, as it is necessary to convert the existing thermal power into zero emissions for achieving net-zero. Japan will thus

develop leading projects to transform fossil thermal power to zero-emission power, i.e., by the utilisation of hydrogen and ammonia. Meanwhile, Asia needs a variety of energy sources and combination of technologies in various phases, Japan is trying to provide these technologies to Asian countries. The examples include renewable energy, energy efficiency improvement, switch from coal to gas, hydrogen and ammonia, CCS and nuclear.

Japan has launched new initiatives to support the decarbonization of Asia. One example is Asia Zero Emissions Community (AZEC). The ministerial meeting was held in February 2023. The chair summary declares that AZEC countries will further discuss, cooperate and take actions in various perspectives like energy efficiency, renewable energy, natural gas and LNG, CCUS/carbon recycling, hydrogen and ammonia, and critical minerals.

The presentation explained the current status and challenges of co-firing of coal and ammonia for power generation. Ammonia has the potential as zero-emission fuel. However, this technology is still under development and has some challenges. One is that the cost of ammonia power generation is much higher than 100% coal-fired power generation. The other is that zero-emission cannot be achieved by using blue and gray ammonia from the life-cycle viewpoint. In order to achieve net-zero in Asia, green ammonia from renewable energy is necessary.

In terms of the question of what decarbonisation technologies Asian countries request Japan to provide, each country may have different answers depending on their energy situations. Japan should listen to the voices of Asian countries based on their long-term roadmap toward carbon neutrality. Multiple and country-tailed decarbonization approach should be explored for each country.

4.3. MUFG's Initiative

MUFG's Initiative to Promote Energy Transition in ASEAN

Yukimi Shimura, MUFG Bank, Ltd., Japan

MUFG is the first Japanese bank to commit carbon neutrality, not only the emissions from the bank's operation but also emissions from its financial portfolio by 2050. The bank also committed to provide finance to sustainable projects with clear numerical targets. In addition to the domestic efforts, MUFG Bank is engaging and/or leading some international or regional initiatives on transition finance. The Net Zero Banking Alliance is one of them. Asia Transition Finance Study Group is another. As an output, the common framework and guideline on Asia transition finance was published last year.

The presentation shared some contents discussed under the Asia Transition Finance Study Group. The study group acknowledges that ASEAN countries are at the starting points toward carbon neutrality, have different targets and face various challenges. For instance, ASEAN countries highly rely on fossil fuels and have unbalanced renewable energy potentials. In addition to the sustainability, the importance of energy stability and affordability, and social stability is recognized for just and orderly transition.

The managed phaseout and phasedown of coal-fired power plant has to be talked when discussing the decarbonization. In comparison with the U.S., EU and Russia, existing coal-fired power plants in Japan and ASEAN region have much lower average age. Older and inefficient plants can be phased out quickly while the others need to find solution.

MUFG Bank is a part of Just Energy Transition Partnership to discuss the early retirement of coal-fired power plants. Some different solution may be needed for relatively new power plants like repurposing as co-firing plants with ammonia. Asian countries and Japan may need to take this interim step and then move completely to a future of renewable energy.

It is definitely essential to expand renewable energy as much as possible to achieve carbon neutrality. However, the potential is not equal by region. Japan and some ASEAN countries may need to find other solutions as it is difficult to achieve the local production and local consumption model. For the industrial sector, hydrogen may play a key role for the heat supply that is not from power. It is thus imperative to build a global supply chain of renewable energy to secure equal access. As a financial institution, MUFG Bank is keen to provide finance to energy transition as well as green project activities. To assist in ASEAN just and orderly energy transition, it needs the evaluation framework covering various dimensions, such as emissions impact, affordability, technology reliability and social considerations, etc.

The presentation explained the reasons for financial institution's needs of decarbonization pathways and roadmaps. The financial institutions follow the global standard for transition finance. It requires corporate's transition plan to be in line with the science-based pathway. But there are limited pathways for carbon neutrality published by the government in Asian region. Both corporate and financial institutions need to fill this gap. There are taxonomies of transition finance and technology roadmaps. But it is necessary to interoperate the different taxonomies, regulations and pathways. As mentioned above, the Asia Transition Finance Study Group published the guideline last year to assist the bankers who are not really familiar with the

taxonomies to at least know how to start. In addition, the pathways published by the academia are often difficult for financial institutions to understand and use in a practical manner. A key question is how to make the pathways to be usable.



4.4. Summary of Q&A

Q&A of this session is summarised as below.

Q: For just transition, what kind of strategies does MUFG Bank have as a financial institution? (Mikiko Kainuma)

A: Basically, we are trying to follow step by step and do not yet have a consolidated strategy since each country or region has different requirement and perspective. We are engaging with customers and relevant stakeholders to realize just transition. For instance, we are a part of the Just Energy Transition Partnership for Asian decarbonisation, of which both Indonesia and Viet Nam are also members. We are talking about the early retirement of coal-fired power plant. We are also actively working on blended finance. As a commercial bank, we cannot donate to achieve the carbon neutrality and do need someone else to take certain risks. Therefore, it is quite important for the public-private partnership.

Actually, we are not only talking with the governments but also bringing Asia's voices to the international community. This is because the discussions on transition finance is mainly limited within developed countries and there is little voice from bottom-up in Asia. We are seeking to close this gap. (Yukimi Shimura)

Q: Japan has its GX (green transformation) policy requiring 20 trillion yen in 10 years, which is planned to be raised as the debt. How will MUFG Bank commit to provide finance to this GX policy? Is it a good idea to seek the debt method for ASEAN countries to promote their GX policies using the revenue from the carbon pricing to repay the debt like Japan? (Naoki Matsuo)

A: Thanks for the question and an overall summary about what is happening in Japan. I think Japanese government tries to pursue the 20 trillion yen by issuing the bonds. We are internally discussing how we could cooperate and contribute to this initiative. So far, there is a general high-level guidance being out. We are seriously looking at the guideline. At this moment, I may not be able to tell how MUFG can actually contribute for this. Japan will need 150 trillion yen, in which 20 trillion yen will be provided by the government and the rest has to be provided by the private sector. We may have more space to consider how we can contribute to the providing of the 130 trillion yen to accelerate carbon neutrality in Japan.

For the second question, it is quite interesting idea and certainly possible to do. We may get the additional funding sources from the international or regional development banks or other initiatives. Instead of individual country, ASEAN as a whole may try for having a bigger bucket. (Yukimi Shimura)

Q: What % of MUFG Bank lending is to the zero and low carbon investments? (S.V.R.K. Prabhakar)

A: Any investment or lending we are providing in nowadays is to certain extent to contribute to low carbon. I think it is depending how you define the low carbon investment or lending. We will have some figures to release in this April. (Yukimi Shimura)

Q: Is Japan doing full life cycle assessment to evaluate different technologies, i.e., ammonia and hydrogen fuel pathways? (Peter King)

A: In case of gray ammonia 100% firing, still there is emission of 0.68 t-CO₂ per MWh from power generation and ammonia production. If only taking the combustion for power generation into account, the emission may be zero domestically in Japan. But the production of grey ammonia in abroad, i.e., in Australia or middle-east, is un-abated. Therefore, we need to evaluate the emissions from the whole process. (Hajime Takizawa)

Q: To Shimura san, I have a question about the Just Energy Transition Partnership as you mentioned. In addition to the phaseout or phasedown of coal-fired and gas-fired power, is there any policy or action discussed on the expansion of renewable energy, especially solar and wind power, under this initiative? (Yosuke Arino)

A: There have been serious discussions on this right now. But we are not in the position to share with the details. As you mentioned, it addresses the early retirement of fossil fuel power plants. At the same time, the investment will be also created for renewable energy. Therefore, it is definitely not just one-sided but for both. (Yukimi Shimura)

Q: An additional question about the transition finance and financial activity in ASEAN region. I would like to ask about the resilience issue of energy, i.e., energy security or adaptation of energy

infrastructure. Do you have any mechanism to mobilize funding from mitigation-centered investment to adaptation related activities? (Yosuke Arino)

A: The word of 'Just' of this partnership is mainly for the employment and impact to the public health from fossil fuel power plants, but not so relevant to adaptation perspective. If you could provide how the adaptation would contribute to the just transition, we may share it with the partnership members. (Yukimi Shimura)

Q: As far as I understand, the VRE (solar PV and wind) is the cheapest option at least in the near future as the power source. It means that we should focus on VRE as the prioritized power source as much as possible. And use others to compensate them. In this sense, is there big room for hydrogen and ammonia that would not be cheaper than VRE? (Naoki Matsuo)

A: As long as we depend on fossil fuel-based hydrogen and ammonia, the problem will happen. Especially after the Ukraine war, fossil fuel prices became quite expensive. Renewable energy is becoming cheaper. The cost will decrease if we use renewable energy and green hydrogen in the future. In that case, zero emission may be achieved at the acceptable cost. (Hajime Takizawa)

Q: For the financing judgement, you may apply carbon pricing. Does MUFG Bank apply some internal carbon pricing calculations for the judgment of financing? If you have, is it different by the project or sector? And, how much is it currently? (Naoki Matsuo, Xianbing Liu)

A: Yes, we do have internal carbon pricing criteria for investment but not for lending for the time being. From the lending perspective, there are much more risk parameters to be involved, not just the pricing issues. As a financier, it would be better to have a

cheaper PV and wind investment or providing the lending facilities for them than providing lending facilities to more expensive energy alternatives like ammonia and hydrogen. We take a look at the whole infrastructure as we have seen many renewable energy projects in Asia but sometimes they are not successful. Not only the cost but also other factors are considered when having the risk analysis. In terms of internal carbon price level, I would not be able to tell the actual price. But we apply a single price for per unit of carbon reduction. (Yukimi Shimura)

Q: Does MUFG Bank have an exclusion list, where no funding will be provided? (Peter King)

A: We do have some documents similar as an exclusion list. It is publicly available. We have clear indication about which one would not be provided by any finance. (Yukimi Shimura)



5. Youth (Session 4)

5.1. Overview of Session

Highlights of the current key actions on mitigation, adaptation, and integrated areas, and expectations and desires for the long-term roadmap toward a resilient net-zero country

Naoyuki Okano, IGES, Japan

In this engaging session, we sought valuable input from young people, who play a crucial role in addressing climate change. To effectively capture their perspectives, we implemented the following style for this session. Rather than the traditional presentation and discussion format, we divided the session into three breakout sessions. This approach enabled us to embrace the diverse viewpoints of the youth participants. Each breakout session was led by youth representatives, ensuring that discussions remained youth-focused and free from undue influence by senior attendees. The discussion topics were thoughtfully curated based on input from the young participants, emphasizing the following four key points:

(i) Expectations for the development of a long-term integrated roadmap for mitigation and adaptation beyond 2050.

(ii) Means of collaboration between youth and multi-stakeholder as a career step.

(iii) Means of youth engagement to overcome barriers between mitigation and adaptation

(iv) Forms of international cooperation between ASEAN and Japan to address the multifaceted challenges of climate change.

The insights gathered from these breakout sessions were subsequently shared during in the plenary session. The young participants emphasized the urgency of addressing climate change for future generations, and proposed ideal approaches for creating the long-term roadmap, such as an intergenerational equity approach and ensuring inclusivity for women and girls. Additionally, it was recommended that youth voices be more actively integrated into the policy-making process. Establishing a youth advisory group was proposed as one potential solution. In the context of youth careers, the creation of more green jobs and opportunities to learn entrepreneurship skills were suggested. The vital role that IGES and other research institutions can play in facilitating youth engagement with policy issues was also acknowledged. However, for a more comprehensive understanding of the youth perspectives, we encourage readers to review each presenter's individual report below, which details their findings from the breakout sessions.

5.2. Breakout Group 1

Highlights of the current key actions on mitigation, adaptation, and integrated areas, and expectations and desires for the long-term roadmap toward a resilient net-zero country from the youth sector

Jeoffrey Laruya, University of the Philippines -Los Baños, the Philippines

Since climate change is permanent and part of today's world, only adaptation and mitigation measures are the chances societies have to lessen the impacts of the fast-changing climate. Promoting active intervention of various sectors to integrate adaptation and mitigation measures into planning and decision making will require policymakers to formulate measures with targeted action plans in their provision. Also, the role and active participation of various stakeholders acts as enablers in implementing policies that will enable future-proofing of society to the impacts of climate change and measures to lessen the worsening condition of the earth's climate. The youth sector with its untapped talents and potential plays a major role in shaping society's future direction on climate change mitigation and adaptation. By encouraging the youth, the roadmap constructed is a picture of well-represented views, expectations, and inputs from this sector and brings sustainability and continuity to its premise.

(i) Expectations for the development of a long-term integrated roadmap for mitigation and adaptation beyond 2050.

The results from the conducted focus group discussion among the youth of ASEAN and Japan

show that their perspective on developing a long-term road map for climate change mitigation and adaptation is anchored on knowing what kind of future they want. In this sense, their expectation is grounded on having specific and doable programs, projects and activities to address climate change issues and concerns in which they can easily participate. They see this achievable through stronger collaborations between the youth sector, governments and non-government organizations. The second expectation is to have a more inclusive environment for the youth in the programs and projects that the roadmap will develop. Welcoming ideas from youths of various backgrounds is essential especially if the youth is tasked to secure the continuation of the involved projects and programs since the road map is set for the long term. Also, part of these inclusive ideals is to provide a more defined role for women and girls. Gender factors should be a prominent feature of future projects and programs to encourage the sourcing of knowledge from more angles. Lastly, initiatives that will promote start-ups greatly draw the interest of both youth and non-youth sectors in program development since they can possibly provide a scheme that can fuel the program's continuity and sustainability.

(ii) Means of collaboration between youth and multi-stakeholder as a career step.

Youth-led organizations are the most common and probably the most effective means to forge collaborations with other stakeholders. It provides young people with accumulated knowledge and capacities to confront the challenges of climate change by building stronger ties from other sectors. Measures to encourage and support youth-led initiatives must be highlighted in future programs since it provides a tried and tested approach to project/program implementation. Youths also do more than just participate in activities. Many youth

groups organize themselves into formal organizations in which the aim is to help society to realize its environmental agenda. Most of these youth-led organizations operate sustainably since it is fueled by volunteerism and passionate individuals. The Philippines' Youth of the Environment in Schools Organization (YES-O) is one such organization that provides a platform for students to develop a sense of responsibility through its various activities that focus on the environment.

The introduction of SDG principles in the school curriculum will greatly help the youth to get familiar with and understand the importance of Sustainable development. It will raise their awareness at an early age giving them a head start on the concept which is foundational so they choose to have it as a career path.

(iii) Means of youth engagement to overcome barriers between mitigation and adaptation

The discussion among participants unanimously agreed that the growth of social media greatly addressed the challenges youth face when it comes to overcoming barriers. Social media platforms enable everyone to reach a wider range of audiences to promote their advocacies and to take advantage of their capabilities. Disseminating climate change-related initiatives has technicalities that too often cannot be understood by the general crowd. Being such, it is important that the terms and findings should be toned down and laymanize to accommodate the public. This will greatly narrow the gap between community and science-based climate change projects and programs.

(iv) Forms of international cooperation between ASEAN and Japan to address the multifaceted challenges of climate change.

Strengthening cooperation between ASEAN and Japanese youth will advance the development of collective climate change adaptation and mitigation strategies since efforts that will be conducted will have a shared impact and responsibility among the involved. Having programs like inter-collegiate or cross-organization cooperation. The exchange of know-how and information among like-minded youths will greatly improve shared values and proper skills and attitudes toward developing more appreciable initiatives that address the multifaceted challenges of climate change.

In conclusion, youth holds a distinct role in the development of a long-term road map for a resilient net zero society. Many initiatives that are highlighted above are already taking place with youth committed and passionate about their cause. The desire of the youth sector to have a conducive environment is aimed to augment its capacity to contribute more to society in relation to climate change adaptation and mitigation initiatives.

Expectations for the development of a long-term integrated roadmap for mitigation and adaptation beyond 2050	
<ul style="list-style-type: none"> Establish specific and doable programs, projects and activities to address issues and concerns on the environment and ecology. Network with other governments and non-government organisations. Inclusive Rely more on Bioenergy 	<ul style="list-style-type: none"> Youths should join more on behavioral change actions from intergenerational approach <ul style="list-style-type: none"> Youth representative should be given a chance to speak about "The future they want" Increase the participation and capacity of women and girls Enhance the project management and entrepreneurship skills of youths in actions

Means of collaboration between youth and multi-stakeholder as a career step.	
<ul style="list-style-type: none"> Encourage and support Youth-led organizations. <p>Example:</p>  <p>YOUTH for ENVIRONMENT in SCHOOLS Organization (YES-O) (Philippines)</p>	<ul style="list-style-type: none"> Opportunities for more SDGs subject as soon as possible in schools. <ul style="list-style-type: none"> Introduced the 17 SDGs to schools Green jobs on hands-on approach at different levels: volunteer, internship, practical, professional.

Means of youth engagement to overcome barriers between mitigation and adaptation	
<ul style="list-style-type: none"> • Creative economies <ul style="list-style-type: none"> ◦ Inclusivity & Leadership role of the youth. • Use social media platform to advocate climate change initiatives. • Laymanize policies and research findings. 	<ul style="list-style-type: none"> • Encourage community participation and initiative in environmental and ecological movements and actions, and • Develop among members and the community proper environmental values, skills and attitudes.

Forms of international cooperation between ASEAN and Japan to address the multifaceted challenges of climate change.	
<ul style="list-style-type: none"> • Encourage the sharing of knowledge and know-how between cooperating entities. • Ensure support and progress in the development of coordinated efforts. 	<ul style="list-style-type: none"> • Cooperation at university level. • Cooperation between shared hobby of youths because they are somehow like-minded. • Joint-projects using power of social media.

5.3. Breakout Group 2

Expectations for the development of a long-term integrated roadmap for mitigation and adaptation beyond 2050

Ayako Takao, Climate Youth Japan / International Christian University, Japan

At the Youth Session, I first introduced my youth NGO, Climate Youth Japan, the youth environmental network NGO. CYJ has many study sessions and holds government advocacy, including policy recommendations and dispatch to UNFCCC COP every year. After the CYJ abstract, we moved on to the discussion with young people from ASEAN and Japan. We discussed the following guiding question: “The expectations and desires for the national long-term sustainable transition toward a resilient net-zero country in the ASEAN region. What are specific inputs into the national long-term

roadmap that helps the society synergize mitigation and adaptation (resilience)”.

Based on the leading question, the role of the youth in the practical field has been suggested, such as contributing to monitoring systems for policy advocacy through academic institutes while having support for the more proactive side, such as encouragement for ensuring the sustainability of youth-led initiatives. Students and young trainees are expected to have experience in the climate change fields, overcoming one of the barriers to synergizing the two areas, which is the lack of countable measures and different indicators, collaborating as a monitoring system research and affirming them for more proactive actions.

In addition to youth-led initiatives, providing a platform for youth advisory groups to visualize youth contribution to the policy-making processes is also critical.

In order to implement those above ideas, the starting point for means to collaborate can be organizing the youth paid internship so that capacity building for the young people itself to address climate change will be secured and expand the options to approach climate change.

The screenshot shows the official website of Climate Youth Japan, established in 2010. It features a blue header with the organization's logo and name. The main content area is divided into several sections: 'Organization Chart' showing a hierarchical structure with boxes for various departments; 'About' providing a brief history and mission; 'Vision' stating the goal of achieving sustainable society through youth-led solutions; 'Activities' listing recent events like the COP21 Project and the Youth COP21 Meeting; and 'More Information' with contact details and social media links. The bottom of the page includes a QR code and a small disclaimer.

5.4. Breakout Group 3

Potential Role of Youth Towards a Net-Zero Pathway

Mohd Noor Musa, Institut Masa Depan Malaysia (MASA), Malaysia

As part of the journey towards net-zero, the Malaysian Government launched the National Energy Policy (NEP) on 19 September 2022, and increased its Nationally Determined Contribution (NCD) target to reduce carbon intensity to 45 per cent by 2030. The NEP focuses to enhance macroeconomic resilience and energy security, achieve social equitability and affordability, and ensure environmental sustainability. Despite the progress achieved thus far, several key challenges in climate mitigation such as high dependence on coal for power generation, low energy efficiency in the economy, reliance on fossil fuels for fiscal revenue, and fragmented climate policies – need to be addressed. Echoing the ASEAN Joint Statement on Climate Change (2019) in acknowledging the importance of youth participation in climate action and efforts, Institut Masa Depan Malaysia (MASA) as the leading think tank promoting the shared prosperity values, outlined several desires and expectation for the long-term sustainable transition towards a resilient net-zero ASEAN. Recognising the multi-faceted role of youth as leaders, changemakers, supporters and ambassadors in initiating and driving sustainable development, youth-led climate movement at local level must be further promoted to ensure continuous engagements and dialogues for climate-friendly policies between local officials and the public. This is to strengthen collaboration and regional cooperation at local levels in ensuring participation

of local community in the climate agenda. Over and above that, synergies between climate and development actions must be top priority for ASEAN, of which ASEAN must not be complacent about adaptation which result in disjointed, weak or lack of impact in its policies and programmes. In addition, ASEAN must invest in its youth capacity building – which is one of the critical components of effective climate action by developing skills, knowledge, networking and institutions necessary to address climate change. For instance, this can be done via embracing and empower the involvement of youth in digital economy and digital entrepreneurship via digital start-ups which provides low-carbon technology support in the production process, thus reducing carbon emissions. Lastly, ASEAN should also focus on developing youth-led, action-oriented climate change programmes which promote climate literacy and equitable community climate solutions to achieve long-term climate goal and accelerate synergised adaptation and mitigation actions toward resilient and net-zero ASEAN Community, in line with the ASEAN Climate Vision 2050.

The followings are some other discussion points (authored by Ms. Temuulen Murun).

- Some Malaysian youths have formed an NGO for campaigning to encourage the government to accelerate climate action and raise awareness toward a net-zero pathway. They have developed several policy briefs on education and economy, suggesting to include climate change-related studies in education curriculum.
- Youth in Japan is also trying to reach out to their government through alumni and working together with NGOs. They have been invited by the government to participate in the green transformation discussion to raise their

concerns and suggestions. However, in both countries, youth groups are finding it difficult to get their voices heard by their governments.

- In this regard, participants in breakout group 3 highlighted that research institutions and universities can work with youth to influence policy formation processes. In general, the key role of youth in both countries is to increase public awareness on climate action and disseminate information for the younger generation to push governments and policymakers to increase ambition and implement climate action.

Breakout Group 1

Means of collaboration between youth and multi-stakeholder as a career step.

YOUTH for ENVIRONMENT in SCHOOLS Organization (YES-O) (Philippines)

- Opportunities for more SDGs subject as soon as possible in schools.

Participants in the video conference: Jeffrey Laruya, Naoyuki Okano, Damasa Macandog, Zul Ilham Bin Zulkiflee Lubes, Toshiko Masu, Yen Nguyen, Lawrence Victor Vitug, Slavka Sakata.

Youth Participants: Jeffrey Laruya, Zul Ilham Bin Zulkiflee Lubes, Yen Nguyen, Mau Nguyen Dang, Lawrence Victor Vitug, Naoyuki Okano

Breakout Group 2

④ Means of collaboration between youth and multi-stakeholder as a career step.

- Providing knowledge sharing platform through mentor-mentee activities among youths and stakeholders
- Professionals/experts could have sharing session via youth-led ASEAN-level organizations--> the issue during this era is that the transition to environmental friendly job markets provides different composition and skillset compared to years ago
- Youth internships (paid) in different environment-related government agencies/NGOs to provide exposures, learnings, and support
- Capacity building- developing skill, knowledge, networking and institution is necessary to address the climate change
- Awareness on the net-zero pathway-Increase the awareness that includes youth, stakeholders, relevant ministries and authorities to participate in the course.
- Sustainable green financing - Channel private capitals towards the transition to a low-carbon and climate resilient economy (eg.: green bonds, climate funds and carbon pricing)
- Synergies between climate and development action - Expansion of the renewable energy such as solar and wind power and sustainable agriculture
- Think how to contribute to the CC

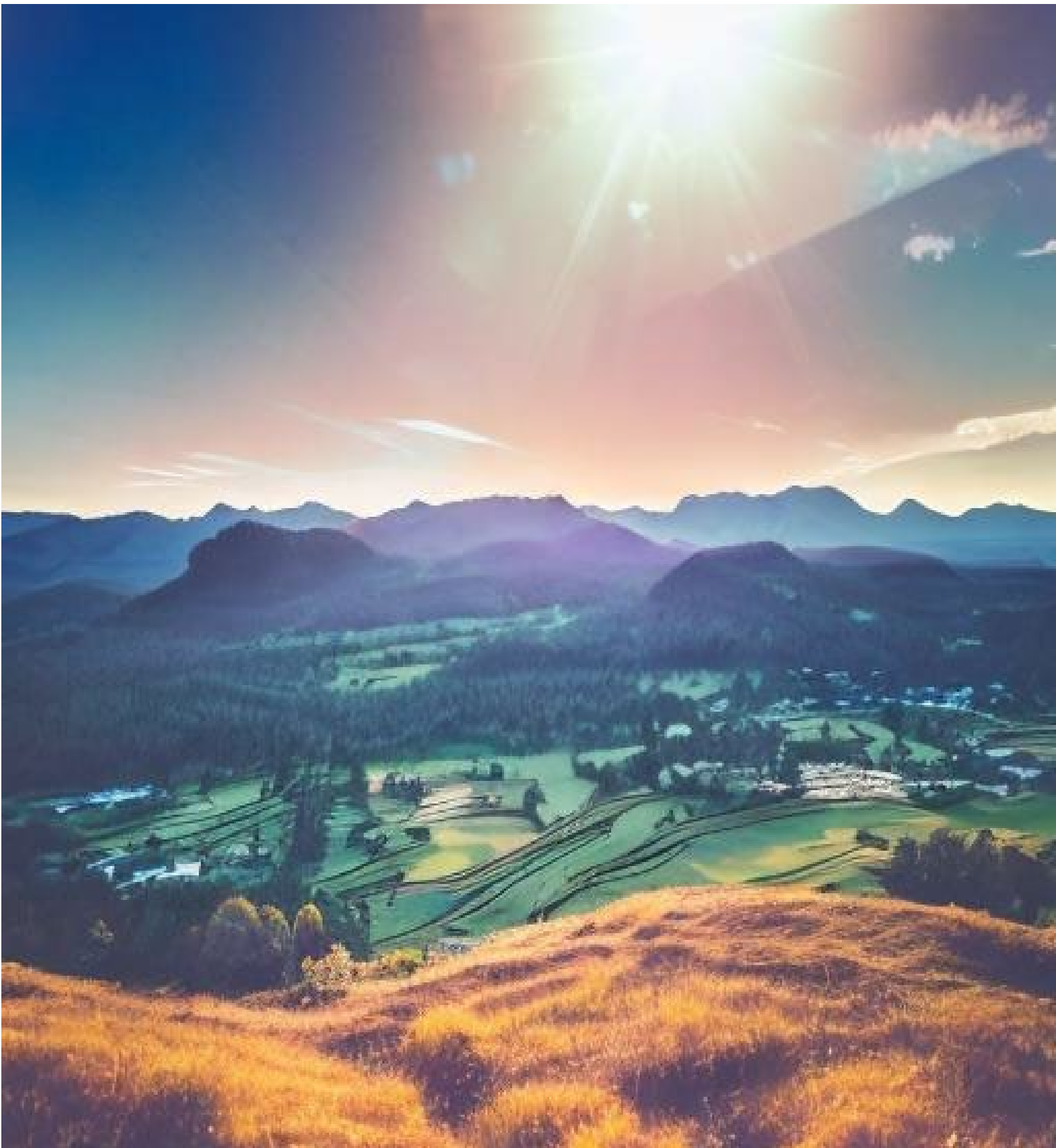
Participants in the video conference: Ayako Takao, Amira Bilqis, Mohammad Zulhafiy Zol Bahari, Rijel Kuncharee, Isaac Kow.

Youth Participants: Ayako Takao, Amira Bilqis, Mohammad Zulhafiy Zol Bahari, Isaac Kow, Rijel Kuncharee

Breakout Group 3



Youth Participants: Mohd Noor Musa, Jin Tanaka, Minh Hai Nguyen, Temuulen Murun



6. Discussion (Session 5)

6.1. Overview of Session

Discussion on the expectations and desires for the national long-term roadmap toward a resilient net-zero country in ASEAN region

S.V.R.K. Prabhakar, IGES, Japan

The session was aimed to discuss the overall presentations and ideas presented in the workshop. Initially, the discussion was focused on the methodological issues related to quantifying the renewable energy and natural resource potential in the study countries. In this regard, Dr. Zhen Jin has presented interim results of a case study on PV and forest issues as a reference. The methodological framework for PV and renewable energy potential was presented. The theoretical RE potential is calculated based on solar radiation per land area. Then as a common method, the potential loss related to land use restrictions will be considered and subtracted from the maximum potential. The potential is calculated from data such as topography, temperature, humidity etc. What is important is to create a grand design for changes in national land space as the large-scale introduction of RE will happen. Subsequently, the evaluation will also consider the ecological impact of RE. To establish a methodology for analysing the environmental impact such as in the form of buildings and forests, large-scale diffusion of rooftop PV can affect the heat island effect as well. This has to be further evaluated. Further, potential loss due to weather vagaries using

weather models, and considering national landscape changes due to sea level rise also need to be considered. There are no such studies that consider all these aspects and hence this study can be a potential value addition.

The case study of rooftop PV in Hayama was shown. The calculations used GIS data by Govt of Japan and Hayama city located along the sea in an area of 17.3 sq km area with 17000 buildings mostly Japanese-style detached. Most buildings an average area of 50 sqm with total of 1.365 million sq km area. Further, by considering that 1 kW of PV requires a 15m² roof area, this total roof area results in a potential PV of 91MW which is the theoretical maximum. This will be affected by the roof slope, age, surrounding buildings, roof shape etc. By considering the hazard map, by excluding the buildings in the disaster prevention warning areas, a 35% potential can be reduced. If sea level rise is also considered, this potential will further go down.

In another case study the rooftop PV potential in Vietnam was assessed by using the open street map. With 837259 buildings, the total roof area was calculated to be 189 million sqm. From this data, the building type, category of area etc could be identified. The challenge is identifying precise building types and areas. There is a need for high-quality GIS data for accurate analysis.

Using a drone survey, a portion of the forest in Hayama City was surveyed. The purpose was to calculate forest stock using drone technology. For this data, a LIDAR camera was used and 3d point cloud data was obtained along with the GIS data. In the survey, two sites A & B were measured with the spatial volume of trees obtained by subtracting the volume of topography and spatial size from the data with the topography of tree data. From this, the space was calculated as 0.9 and 0.8 million square meters. A second drone survey was conducted

using a different camera to find if there is any change in the results. From this data, coordinates, height and canopy area of trees were obtained. The resulting 3d cloud data could be used along with AI to identify the type of trees, area of trees, biomass stock, etc. From these cases, it became clear that the appropriate methodology need to be identified. There is a need to integrate various kinds of data which will form a basis for policy decisions and implementation. For a regional-level application, cross-border sharing of data and the monitoring of the natural environment is essential.

One of the issues of RE potential studies could be their reliability, especially in terms of realizing the assessed potential as the potential could be affected by so many variables. Drone surveys provide more detailed information but they are also very costly. Hence, collaborations employing satellite data and ground-truthing that information with drone studies will provide more accurate estimations. The national governments should take the responsibility of building up the databases for cities for researchers to use for policy analysis.

While the above presentation was on estimating the solar PV potential in a rooftop deployment mode, which has huge potential in Asia, the subsequent presentation by Dr. Makino Yamanoshita focused on the role of agriculture in contributing to the net zero worlds. Based on a case study of the coffee sector in Vietnam, the study looked into the adaptation and mitigation synergies.

Agriculture plays an important role in the economic, social and livelihood resilience of communities in Asia. However, agriculture is also highly vulnerable to climate change impacts and is also a source of GHGs. Hence, mitigating GHGs while improving resilience is an important challenge that agriculture faces in Asia and elsewhere.

The research questions being considered are how the agriculture sector can remain viable in the long term and how to maximize mitigation benefits while adapting to long-term climate change, how to enable a multi-stakeholder and bottom-up transition strategy that includes local farmers. The overall objective of the research is to examine how to adapt to long-term climate change and how to mitigate GHG emissions by engaging several stakeholders in central Highland, Vietnam.

While focusing on the coffee sector in the central highlands of Vietnam, the study looks at the high potential of coffee cultivation in Vietnam. In Vietnam, the private sector is working on improving the sustainability of coffee production. However, it is not clear to what extent these measures include climate change adaptation and mitigation. The Rain Forest Alliance and other stakeholders are working with farmers and are using voluntary sustainability standards for the sustainability of coffee production. However, certification is not accessible to poor farmers while it is highly targeting the rich and large farmers. Some programs consider landscape approaches in Vietnam, there are very few such programs that consider public and private sector collaborations.



Climate model analysis predicts decreasing precipitation and increasing temperatures in coffee-producing areas of Vietnam. Hence, conventional practices may not be sufficient to sustain coffee production in the changed climate. Farmers often think they need more water and fertilizer for more production leading to unsustainable use of resources. There is a need to reduce chemical fertilizers without reduction in production, reduce GHG emissions and enhance the resilience of farmers to future droughts. Practices such as farm diversification, water conservation practices, integration with agroforestry that can increase the carbon stock and carbon sequestration, and training of farmers and farmer groups on best management practices could contribute to win-win solutions. The study will look into how these practices will contribute to the adaptation of farmers to future climate change scenarios while maximizing the mitigation potential and collecting farmer perspectives on various adaptation and mitigation activities. The study will also look into sustainable transition pathways for the most vulnerable farmers and ethnic minorities.

The agriculture sector provides the best synergies between adaptation and mitigation and hence it is important to implement adaptation and mitigation measures according to the potential the sector provides. However, the situation varies from country to country and within country farmer groups differ in their ability to implement various measures. There is a need to keep in view the production cost as it could affect the income of farmers which is already under stress.

Asia is abounding with small and marginal farmers who are also highly vulnerable to climate change. Hence, it is important to consider their socio-economic conditions while identifying appropriate solutions which are often identified and promoted in a top-down manner. There is also a need to be

careful in translating the study findings from the coffee case study to other crops and regions beyond Vietnam as agricultural production is highly varied across the region and considering local contexts is very important for not generalizing the findings.

Prof Damasa Macandog opined that there is a need to increase the awareness of stakeholders, build the capacities of local communities, early warning of impending disasters etc. play an important role in ensuring the success of policy measures. When communities' capacities are improved, then the adaptation and mitigation measures could be well synergized. For promoting net zero transition, technology adoption is a challenge as the available technologies are not widely available. Hence, scaling these technologies need to address the issues of cost and affordability. The research should come up with identifying various enabling environments that can help scale up the technologies. The limitation is often the effective policy implementation. Businesses play an important role in achieving the net-zero transition and they can work with the local governments and communities by promoting solar PV and by improving the awareness of communities to change their lifestyles, promoting access to affordable technological choices etc. They can also be the mouthpieces of government policies by effective implementors of government policies and showcase that the policies can be effectively and reliably implemented. There are examples where the government policies such as phasing out plastic was effectively adopted by private companies by engaging with the government in plastic recycling and plastic recycling certificates.

Dr Peter King stressed that looking at the energy systems transformation is possible as there are hundreds and thousands of actions available for governments and the private sector to implement. Governments often resort to low-hanging fruits such as change of bottles and bulbs etc but they may

not lead to the kind of transformation and transition we are aiming for. Hence, the use of criteria to evaluate actions can help governments and the private sector. Criteria such as will the action help in achieving the net zero, is there a good baseline, what is the coherence and synergy of action with other actions, benefits such as health, biodiversity etc., the extent of equitable outcomes, winners and losers and constraining factors, cost-effectiveness, can it be done quickly, can the impacts be seen clearly, how feasible it is both in terms of physically and technically, acceptability of communities, transboundary and inter-generational impacts etc. This kind of analysis is need to be done in every national context as they vary from country to country and both ex-ante and ex-post analysis.

The third commentator opined that the key areas and approaches for mitigation and adaptation measures are the collaboration between multiple stakeholders, the involvement of local communities and the role of good policies and actual implementation on the ground. Multi-stakeholder engagement is unavoidable as net zero transition involves multiple areas and technologies where multiple sectors and stakeholders are involved. Information dissemination from science to policy also plays an important role in the efficient transfer of knowledge and technology. In the Philippines, there are several policies for both adaptation and mitigation but there is a need for good implementation and this can be achieved by building the capacity of stakeholders and by empowering them as decision-makers. The role of civil society is also vital in the process. While there are good proposals for the engagement of civil society, there are no good linkages for implementation level and hence identifying good cases that engage civil society needs to be developed that showcase benefits and challenges. In summary, there is already a lot of information on what sectors are to be focused on,

what technologies need to be implemented etc. However, there is a need to scale up these existing practise, innovations and policies while addressing the known bottlenecks and understanding unknown bottlenecks will pave the way for the region to achieve net zero.

6.2. Case of Solar PV and Forest

The methodology for mitigation and adaptation synergy: Tentative results of the case study on PV and Forest

Zhen Jin, IGES, Japan

Dr. Jin from IGES pointed out that accurately understanding the potential for renewable energy and natural resources could be the basis for creating the methodology for mitigation and adaptation synergy. During the presentation, interim results of case studies conducted in Japan and Vietnam were introduced. In the case of Japan, the potential for rooftop PV installation in the town of Hayama was calculated. The total rooftop space for buildings over 50 square meters in Hayama is 1.36 million square meters, with a total PV potential of 91MW. If to exclude buildings located in the disaster prevention warning area, the renewable energy potential is reduced by 35%. The next step is to evaluate the ecological impact of introducing renewable energy and assess potential losses. Therefore, establishing methodologies for analyzing the environmental impact of each building, agriculture, and forest is important.

In the case of Vietnam, it was identified that there are 830,000 buildings with a total building area of 188 million square meters, using open data provided by Open Street Map. Due to data limitations, the

analysis of PV potential could not be as precise as in the Japanese case.

Regarding forest resource surveying, the results of a forest drone survey conducted in Hayama Town were presented. The 3D point cloud data and GIS data from the survey using LiDAR cameras show that it is possible to estimate the spatial volume of the trees. The next step is to analyze the data surveyed from within the forest using a special camera. The objective is to identify the percentage of forest accumulation per space, but there are many challenges.

6.3. Viet Nam's Coffee Sector

The national long-term roadmap toward a resilient net-zero country in the agriculture sector: A study in coffee sector in Vietnam for sustainable transition promoting adaptation and mitigation synergy

Makino Yamanoshita, IGES, Japan

Agriculture is fundamentally important to ASEAN countries as it is essential to ensuring food security and it is a vital sector for the economies. At the same time, agriculture sector is a major GHG emission source and a driver of forest and other natural ecosystems conversions. An unique feature of the agricultural sector is the involvement of many small farmers vulnerable to climate change. Thus, the participation of stakeholders should be carefully considered when developing the national long-term roadmap to synergize mitigation and adaptation in agriculture sector. We set the following research questions;

- How can the agricultural sector, a major industry in ASEAN countries, remain viable in the long term while adapting and mitigating climate change?
- How can we develop a multi-stakeholder and bottom-up transition strategy at a national level that includes the local small farmers?

In this presentation, an initial plan of a case study for sustainable transition promoting adaptation and mitigation synergy was explained.

To examine how to adapt to long-term climate change and how to maximize mitigation toward climate neutrality a case study will be conducted targeting on the coffee sector in the Central Highland, Viet Nam. Viet Nam is the world's second largest coffee (robusta) exporter and private sector-led initiatives for sustainable coffee production have been recently started in response to the sustainable sourcing policy of importing companies. A program with a landscape/jurisdictional approach is being implemented to make the entire Dak Lak province a sustainable coffee production area. Multi-stakeholder governance including the government, importer companies, local exporting companies and farmers as well as technical support on the sustainable coffee farming practices for the local farmers are applied in the program. We will conduct survey as follows.

- To identify adaptation options in coffee production for future long-term climate change scenarios (ex. 1.5°C and 3°C) by discussing with researchers, government and experts in private sector.
- To analyze whether the sustainable farming practices introduced by the current program contributes to strengthen adaptive capacity (local resilience)
- To identify the adaptation option that maximizes mitigation benefits by calculating with emission factors

- To propose necessary mechanism to engage local farmers to the sustainable transition pathways considering local farmers perspectives especially the most the most vulnerable farmers including poor and ethnic minorities.





7. Conclusion

7.1. Key Findings

This Scoping Workshop was an important first step to identify the research scope that is really necessary now in the ASEAN region to develop a guidance on national long-term roadmap to synergise mitigation and adaptation by the year 2025. Integration of mitigation and adaptation is of a fundamental need in the ASEAN region as well as the rest of the world, but there has yet to be a comprehensive study to translate scientific findings into a practical usable national roadmap, which is key to scaling up good practices on the ground and local communities or invent new approaches enabling systematic integration of separate sectors. For this purpose, the findings of the project will also be reflected in the ASEAN Climate Change Strategic Action Plan 2025-2030 (ACCSAP), expectedly generating wider impact over the ASEAN region.

To this end, this Workshop invited four indicative stakeholders from target ASEAN countries, i.e., government, think-tank, business/industry, and youth, and discussed the expectations or suggestions about the purpose, scope and methodology of overall framework of long-term roadmap. It was confirmed that different perspectives and voices from various stakeholders across ASEAN countries together form the ground and direction of this aspirational research project. Their continuous engagement will also be the basis of implementation phase to enable long-term resilient net-zero transition. Key findings or

suggestions in the Workshop are summarised as follows.

- The current world systems (including hard infrastructures and soft infrastructures such as institutions and legal frameworks) were not made by the current youth people. Youth's continuous involvement is the most important factor to inject a transformative perspective into the design of the national long-term roadmap, resulting in avoiding lock-in of socio-ecological systems. Students, youth-led organisations and youth professional workers are key players to facilitate multi-stakeholder engagement, as youth people are in an advantageous position to build stronger ties with other sectors or areas and to co-create a shared value for distant future. New (not locked-in) perspectives flowing from youth people's mind will be affecting existing socio-ecological paradigms, including national *vision*, *climate goals*, and *transition pathways*.
- In designing *transition pathways* (roadmaps), i) *societal or developmental visions*³ and ii) *climate goals* of a resilient net-zero country should be understood well. This is because i) and ii) will affect the patterns of long-term pathways, potentially generating a wide variety of roadmaps across ASEAN countries. For example, regarding ii), specific goals of what kind of net-zero energy system (including decarbonisation technology) should be achieved is still very uncertain (e.g. whether a future of complete renewable energy is pursued as an ultimate goal; and energy mix of abated fossil fuel power, hydrogen/ammonia and distributed renewable power in a target

³ For example, the "Bio-Circular-Green Economy" model or "Sufficiency Economy Philosophy" in Thailand (Please see Section 3.3).

year). Thus, understanding what kind of net-zero goal is assumed is a vital first step to specify a resilient net-zero transition.

- Following the identification of the range (uncertainty) of climate goals, detailed critical factors and conditions for clean energy transition (e.g. phasedown or phaseout of fossil fuel power; and diffusion and mainstreaming of renewable energy) need to be understood by means of evaluation frameworks with detailed criteria including technological (e.g. reliability), economic (e.g. affordability), social, and environmental (e.g. emission reduction) aspects. Evaluation frameworks of the nexus between clean energy transition and resilience or adaptation areas give a connection point of mitigation and adaptation. Evaluation frameworks of policy, institutions, or specific actions can provide necessary and sufficient conditions for a resilient net-zero transition pathway based on scientific criteria some of which may be properly monitored by stakeholders. Identification of timeframe of transition (e.g. interim step and final goal; and until 2030 and net-zero year) will help stakeholders translate into practical actions.
- Generation of adaptation synergy in mitigation transition may be able to promote just and orderly transition, integrating mitigation and adaptation transitions in a sustainable and inclusive manner. This is because resilience and adaptation to climate change can enhance energy and social stability, a central concept of just and orderly transition. This kind of knowledge to integrate mitigation and adaptation transition is worth being shared with stakeholders involved in transition finance (including taxonomies) in ASEAN. This can be a good opportunity to mobilise finance towards the goal of resilient net-zero transition in ASEAN.
- Adaptation to climate change requires a spatially distributed decision making by local communities. At the same time, mitigation also requires consideration of impact on the local stakeholders and communities. Especially, distributed renewable energy such as solar PV, wind, and biomass have a potentially huge impact on land use, including biodiversity. Starting from the potential of renewable energy, understanding of its impact on resilience of local communities will provide clear linkages between net-zero mitigation transition and adaptation transition. Resilience factors which are relevant to exposure and vulnerability (adaptive capacity and sensitivity) need to be considered: for example, institution/governance, infrastructure, land-use, nature conservation, city structure, local / vulnerable people, socio-economic changes, industrial structure, and demography. It was also discussed that youth-led climate movement (including education or research) at a local level can promote deeper system integration of mitigation and adaptation
- Target ASEAN countries (Indonesia, the Philippines, and Thailand⁴) have various policy and institutional frameworks and networks to enable a resilient net-zero transition, or a net-zero “climate resilient development pathway” (CRDP). There are wide cross-country variations in national developmental vision,

⁴ The 2nd “Thailand Climate Action Conference” (TCAC) to be held in mid-2023 will aim to balance mitigation and adaptation actions.

vulnerability to climate change, priority of adaptation over mitigation, scientific capacity to model GHG emission pathways or climate risks and vulnerability, governance structure, etc. Therefore, there is an immense potential for learning and capacity development by collaboration of multi-stakeholders in ASEAN and outside (e.g. Japan and other countries). Ongoing processes of revising or updating climate national policy documents provide rich lessons for the design of macro-frame of national roadmap which allows for adaptive and flexible transition towards a long-term goal, a necessary condition of well-designed CRDP.

- Stock-taking of the efficacy and lessons of ongoing in-country and international scientific research projects (e.g. LoCARNet for mitigation, and AP-PLAT for adaptation) is a vital step toward a more rigorous science-based policy making synergising mitigation and adaptation. Moreover, a perspective to link not only “science and policy” but also “science and communities” is pivotal for a mitigation-adaptation integrated transition. We need to narrow down the gap between community and science-based climate change projects and programmes. Community’s aspect needs to be incorporated in the national long-term roadmap.
- Agriculture is fundamentally important to ASEAN countries for ensuring food security and economic prosperity. Many small farmers are often very vulnerable to climate change, and thus involvement of vulnerable communities including farmers, women, and children should be carefully considered in developing national long-term roadmap to synergise mitigation and adaptation in the agriculture sector.

- All stakeholders involved in long-term roadmap development need to answer the question of “How to make the pathways (roadmaps) to be usable and doable”, considering the fact that the pathways published by the academia are often difficult to use in a practical manner. For this, it should be recognised that i) long-term pathways are diverse and uncertain by nature, and that ii) usability by private (e.g. financial) sectors need to be well defined and understood by proper consultations. For i) and ii), it is important to formulate an iterative approach as a part of long-term roadmap development to ensure an adaptive process of resilient net-zero transition, while ensuring science-based policy making in terms of long-term projections and monitoring and facilitating learning of all stakeholders including government, think-tank, business/industry and youth. This will create an enabling condition for ASEAN countries to promote a net-zero climate resilient development toward their long-term goals.

7.2. Way Forward

This Scoping Workshop served as such as an opportunity to discuss the scope and fundamental methodologies for national long-term roadmap synergising mitigation and adaptation. As a way forward, the present project will be implemented in parallel with the ACCSAP to generate synergies with development of the ASEAN regional climate strategy. The 2nd Workshop is planned in March 2024 to discuss the preliminary results of individual analyses, and the 3rd Workshop is planned in early 2025. The output of the “Guidance on the National Long-term Roadmap to Synergise Mitigation and Adaptation” is scheduled to be published by March 2025.

Appendix

Programme

29 March 2023, 9:00-16:10 (GMT+7)

Moderator: Chisa Umemiya, IGES¹⁾

GMT+7 ²⁾	Contents ³⁾		
9:00 ⁴⁾	Opening remarks ⁵⁾ <ul style="list-style-type: none"> Tsuyoshi Kawakami, IGES, Japan⁶⁾ Junko Nishikawa, Ministry of the Environment, Japan⁷⁾ 	13:00 ⁸⁾	#3: Business/Industry Session - Highlights of the current key actions on mitigation for clean energy transition, and expectations for the long-term roadmap toward a resilient net-zero country ⁹⁾ Moderator: Xianbing Liu, IGES ¹⁰⁾ <ul style="list-style-type: none"> Hajime Takizawa, IGES, Japan - Overview¹¹⁾ Yukimi Shimura, MUFG Bank, Japan - Finance sector¹²⁾
9:10 ¹³⁾	Briefing of the project's implementation plan (objective, methodology on a long-term roadmap to synergize mitigation and adaptation, outputs and outcomes, etc.) ¹⁴⁾ <ul style="list-style-type: none"> Yosuke Arino, IGES, Japan, Integration of mitigation and adaptation¹⁵⁾ Xianbing Liu, IGES, Japan, Mitigation transition toward a net-zero country¹⁶⁾ Osamu Mizuno, IGES, Japan, Adaptation transition toward a resilient net-zero country¹⁷⁾ 	14:00 ¹⁸⁾	#4: Youth Session - Highlights of the current key actions on mitigation, adaptation, and integrated areas, and expectations and desires for the long-term roadmap toward a resilient net-zero country ¹⁹⁾ Moderator: Naoyuki Okano, IGES ²⁰⁾ Breakout Room Session (40 minutes): 30 min discussion + 10 min summary, participants can choose which rooms to join ²¹⁾ 2 or 3 Breakout rooms (5-8 participants in each breakout room) ²²⁾ Presentations from each breakout room and plus (ASEAN and Japan): Personal view and/or summary of breakout-room discussion ²³⁾ <ul style="list-style-type: none"> Jeffery Laguya, University of the Philippines Los Baños (UPLB), The Philippines²⁴⁾ Ayako Takao, Climate Youth Japan (CYJ) & International Christian University (ICU), Japan²⁵⁾ Mohd Noor Musa, Institut Masa Depan Malaysia (MASA), Malaysia²⁶⁾
9:40 ²⁷⁾	#1: Government Session - Highlights of the current key national policy on mitigation, adaptation, and integrated areas, and the expectations for the long-term roadmap toward a resilient net-zero country based on national development vision ²⁸⁾ Moderator: Binaya Shrivastava, IGES ²⁹⁾ <ul style="list-style-type: none"> Tennuulen Muren, IGES, Japan, Governance/Institutional arrangement³⁰⁾ Mr/Ms. AA, Ministry of Environment and Forestry, Republic of Indonesia (TBD)³¹⁾ Mr/Ms. AA, Department of Environment and Natural Resources, The Philippines (TBD)³²⁾ Suriyassa Thanayattawit, Office of Natural Resources and Environmental Policy and Planning (ONEP), Thailand³³⁾ Mr/Ms. AA, Department of Climate Change, Ministry of Natural Resources and Environment, Viet Nam (TBD)³⁴⁾ 	15:05 ³⁵⁾	Break ³⁶⁾
10:40 ³⁷⁾	#2: Think-tank Session - Highlights from scientific communities on mitigation, adaptation, or integrated area & expectations for the long-term roadmap toward a resilient net-zero country ³⁸⁾ Moderator: Yosuke Arino, IGES ³⁹⁾ <ul style="list-style-type: none"> Rizaldi Boer, IPB - Indonesia's case⁴⁰⁾ Damas B. Magcale-Macandog, UPLB - The Philippines' case⁴¹⁾ Bundit Limmeschokchai, SIIT-TU - Thailand's case⁴²⁾ Toshihiko Masui, NIES, Japan - AIM model development and application⁴³⁾ Tomoko Ishikawa, IGES, Japan - LoCARNet⁴⁴⁾ Slavka Sakata, NIES, Japan - AP-PLAT⁴⁵⁾ Q&A ⁴⁶⁾	15:10 ⁴⁷⁾	#5: Discussion Session - Discussion on the expectations and desires for the national long-term roadmap toward a resilient net-zero country in ASEAN region ⁴⁸⁾ Moderator: Prabhakar, S.V.R.K., IGES ⁴⁹⁾ <ul style="list-style-type: none"> Zhen Jin, IGES, Japan - A methodology for mitigation and adaptation synergy⁵⁰⁾ Makino Yamanoshita, IGES, Japan - A methodology for mitigation and adaptation synergy⁵¹⁾ Responses from stakeholders including governments, scientists, business/industry, and youth (totally 4 persons)⁵²⁾
12:00 ⁵³⁾	Lunch Break ⁵⁴⁾	16:05 ⁵⁵⁾	Summary of the meeting and concluding remark ⁵⁶⁾ Yosuke Arino, IGES, Japan ⁵⁷⁾

Participants Information

The Scoping Workshop had 77 participants whose countries are Australia, Indonesia, Japan, Myanmar, Malaysia, the Philippines, Thailand, US, and Viet Nam (Figure 4).

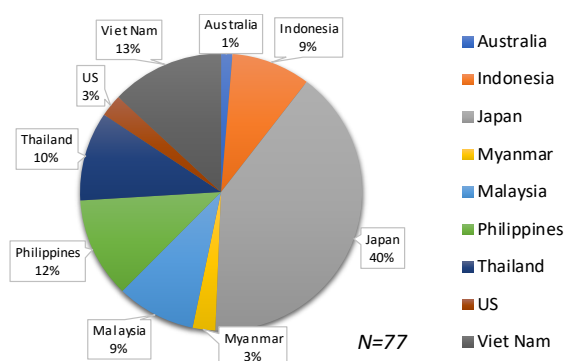


Figure 4. Participants' Countries

Table I shows the organisations and countries of participants. The organisations include ASEAN bodies, national governments, power companies, financial companies, think-tanks, and youth groups.

Table I. Participants Organisations and Countries

Organisation	Country
ACEAN Centre for Energy	ID, US
ASEAN Centre for Biodiversity	PH
ASEAN Secretariat	ID
CCROM SEAP, IPB University	ID
Climate Change Division, Environmental Conservation Department, Ministry of Natural Resources and	MM
Climate Youth Japan	JP
EVN	VN
Gb software	MY
Ha Noi University of Natural Resources and Environment,	VN
IGES	JP
IMHEN	VN
Institut Masa Depan Malaysia (MASA)	MY
Institute of Biological Sciences, UPLB	PH
International Christian University	JP
Laguna State Polytechnic University	PH
Ministry of the Environment, Japan	JP
MUFG Bank	JP
National Institute for Environmental Studies	JP
Office of Natural Resources and Environmental Policy and Planning (Thailand)	TH
Oriental Consultants Global Co.Ltd.	VN
PLN	ID
Thai Parliament TV	TH
THAMMASAT University	TH
UNISC (University Student Chamber) International	JP
Universiti Malaya	MY
University of the Philippines Los Banos	PH
University of the Philippines Rural High School (UPRHS)	PH
Vietnam Electricity	VN
Youth for Energy Southeast Asia	TH

Presentation Files

1. Framing presentation

1.1. Long-term Roadmap for Mitigation-Adaptation Integration



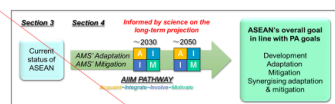
Background: Processes up to now

- COP26 side-event: Secretary General's remark in November 2021
- 13TH MEETING OF THE ASEAN WORKING GROUP ON CLIMATE CHANGE (AWGCC) on 29 June 2022 in Jakarta, Indonesia
- THE 16TH ASEAN-JAPAN DIALOGUE ON ENVIRONMENTAL COOPERATION on 6 October 2022 in Siem Reap, Cambodia
- CHAIRMAN'S STATEMENT OF THE 25TH ASEAN-JAPAN SUMMIT PHNOM PENH, CAMBODIA on 12 November 2022
- COP27 side-event "Japan's contributions towards a decarbonised and resilient Asia" on 12 November 2022 in Sharm el-Sheikh, Egypt
- Day 2 will be a closed meeting with AWGCC and ASEAN Secretariat on the ASEAN Climate Change Strategic Action Plan 2023-2030 (ACCSAP)



2

Setting long-term mitigation roadmap to net-zero was prioritized



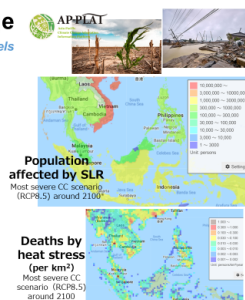
3

Section 3: Current status and outlook of the ASEAN region

Future impacts of climate change

Projected climate change and impacts by climate models (from AP-PLAT etc.)

1. The projected climate change varies from country to country within the ASEAN region
2. General trend in **increased extreme events** such as an increase in **extreme precipitation events**, increase in **hot days**, **extreme floods**, and change in the behavior of **tornadoes and droughts**.
3. **Climate change impact on crop productivity is significant** in the ASEAN region. For rice crop, the CO₂ fertilization effect can also be seen prominently.
4. **Significant economic impact and number of people affected due to sea level rise (SLR)** in Indonesia, Thailand and Vietnam
5. The **heat stress impacts** are significantly higher in countries such as Myanmar, the Philippines, Thailand and Vietnam. A need to introduce adaptation practices.



Source : AP-PLAT HP <https://ap-plat.nies.go.jp/> 4

1

Section 3: Current status and outlook of the ASEAN region

GHG emission pathways

The global 1.5 °C target calls for ASEAN to achieve a **net-zero CO₂ emission in 2050** while ASEAN needs to achieve **net zero GHG emissions in 2065** on average across models.

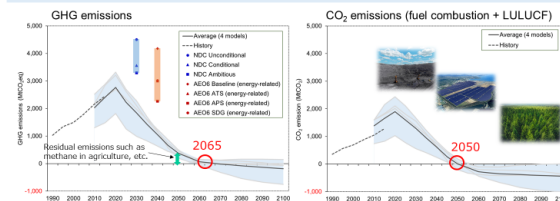


Figure 16. Historical and future GHG and CO₂ emissions pathways in ASEAN to meet the 1.5°C target at a global scale. CO₂ emissions include emissions from fuel combustion, industrial processes, and LULUCF. Four models whose simulation results shown are AIMCGE 2.1, MESSAGE-GLOBIOM 1.0, REMIND-MagPIE 1.7-3.0, and WITCH-GLOBIOM 4.4.

5

Section 4. Toward the ASEAN climate vision 2050

ASEAN's long-term climate goals

Goal for synergising adaptation and mitigation

Wherever possible, adaptation interventions should aim for synergy with mitigation transition in order to drive the ASEAN transformative pathway toward resilient net-zero emissions. For this purpose, climate change adaptation and mitigation need to be integrated using cost-effective solutions that maximise well-being.

Adaptation goal Integrate Mitigation goal

- Process-oriented and/or outcome-based goals for sectors commonly impacted across AMS such as sea-level rise and urban heat island effects
- **Ensure adaptation transition's synergy with the mitigation transition toward net-zero emissions**
- Realise **net-zero GHG emissions as early as possible in the latter half of the 21st century**.
- Realise **peak GHG emissions as soon as possible after 2030** to ensure the net-zero GHG emission goal is met on schedule.

Development goal

Realise the AMS developmental goals, recognising the extent of multi-dimensional trade-offs and synergies among the sustainable development goals (SDGs) related to energy security, resources, food, water, safety and climate.

Objective of this project (Day 1)

National Long-term Roadmap to Synergize Mitigation and Adaptation

Output by March 2025

- Jointly develop a **Guidance** for the **development of a long-term roadmap** for achieving climate-neutral and resilient societies in major ASEAN countries
- Identify **critical elements (social, economic, institutional, land use, etc.)**, **indicators** and transition **mechanisms** for implementation of transition to maximise synergies between mitigation and adaptation

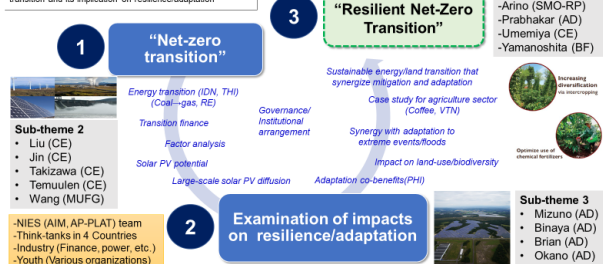
Outcome objectives

- Contribute to **strengthening, revising or promoting the implementation** of Nationally Determined Contributions (NDCs), long-term strategies, national adaptation plans, sectoral and cross-sectoral plans (e.g. medium- and long-term energy plans, plans for forest conservation), **including** through **the use of** the Guidance in **Asian (e.g. ASEAN) countries**.

7

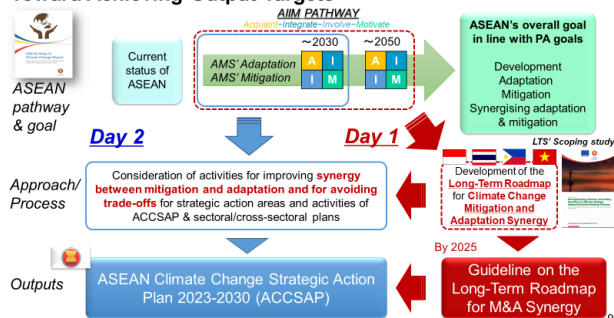
General Approach of this project

Objective and approach
To develop a guidance for national long-term roadmap to synergize mitigation and adaptation by examining a net-zero transition and its implication on resilience/adaptation

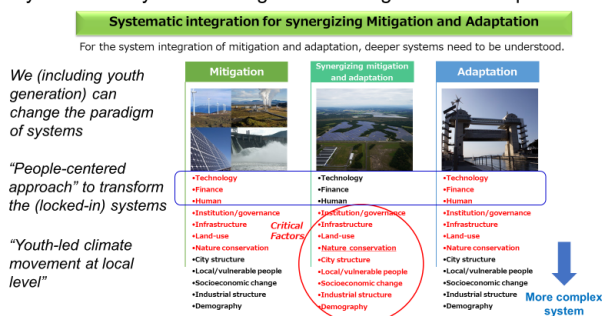


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Toward Achieving Output Targets



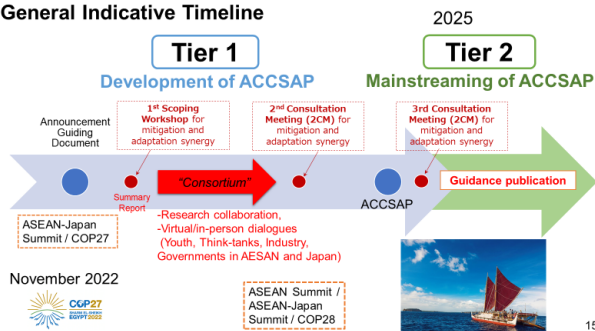
Day 1. Summary toward integration of mitigation and adaptation



Day 2 and beyond



General Indicative Timeline



Institute for Global Environmental Strategies (IGES)

Thank you very much

arino@iges.or.jp



16

1.3. Resilient Net-Zero Transition

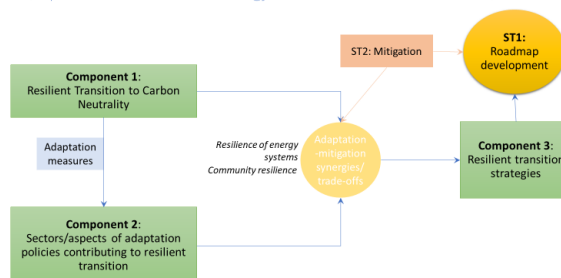
Sub-theme 3 (ST3): Adaptation Measures for Adaptation-Mitigation Synergies

• Scoping Workshop on the Guidance for National Long-term Roadmap to Synergize Mitigation and Adaptation

• March 29, 2023

Osamu Mizuno (on behalf of ST3 members)
Adaptation and Water Area
Institute for Global Environmental Strategies (IGES)
E-mail: o-mizuno@iges.or.jp

ST3: Analysis of the transition to adaptation in harmony with mitigation (expansion of renewable energy, nature-based solutions, etc.)



Component 1: Resilient Transition to Carbon Neutrality

Guiding research question: How can we make resilient transition to carbon neutrality possible?

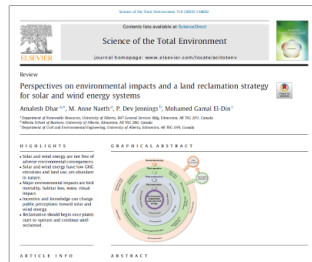
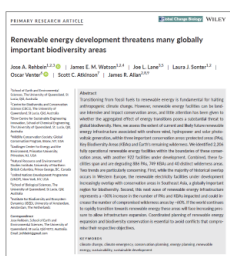
1.1: Analysis of the impact of the carbon-neutral energy system on the resilience of the society, community, etc.

1.2: Analysis of the resilience of the carbon-neutral energy system to the climate risks

1.3: Formulation of adaptation measures in target countries based on the analysis of 1.1 and 1.2.

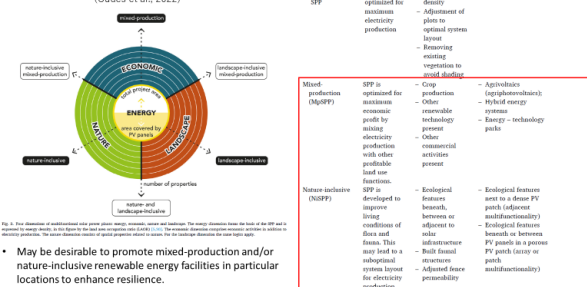
Challenges with renewable energy transition in the context of resilience and biodiversity

- Potential negative impacts on environment, biodiversity, food production, etc., if not planned well.
- Land needs to be restored during and after construction of solar/wind energy facilities to reduce environmental impacts.



Enhancing resilience through multifunctional land management of renewable energy facilities

Typology of multifunctional solar power plants
(Quesada et al., 2022)



- May be desirable to promote mixed-production and/or nature-inclusive renewable energy facilities in particular locations to enhance resilience.

Component 2: Sectors/aspects of adaptation policies for long-term roadmap

Guiding research question: How can adaptation interventions contribute towards transitioning to a resilient and carbon-neutral development?

2.1: Identifying the aspects, sectors, and processes of adaptation that can be integrated into the concept of the "long-term roadmap" towards transitioning to resilient and carbon neutral development.

2.2: Analyze key adaptation sectors/aspects and their contributions to net-zero transition.

2.3: Prioritizing technologies/measures/processes of adaptation to be incorporated into long-term roadmaps

Example: Identifying adaptation options/practices

Risk Clusters	Adaptation options
Infrastructure and services	Building codes, retro-fitting (such as for cooling/heating), land use planning, resilient infrastructure, disaster reconstruction, disaster early warning, weather forecasting,
Livelihoods and habitats	Income diversification, improve access to basic services (food, housing, water, health), social protection, insurance
Water security	Water harvesting and recharge, water storage, water efficiency improvements (drip irrigation), water saving devices, pollution control, safer access to drinking water and sanitation, solar water heating, desalination, solar pump, water reuse, improve drainage
Food security	Drought/flood/salt tolerant varieties, crop diversification, integrated farming/aquaculture, efficient food supply and local production (e.g., urban farming), minimize food loss/wastages
Health	Access to health and nutrition, prevention of vector-borne diseases, heat stress relief centres and emergency facilities, affordable in-door cooling, weather forecast and pest early warning, heat action plans
Conflict and migration	Internal (rural to urban) and external migration, resettlements, remittances, trans-boundary cooperation on common risks, adaptive governance,
Ecosystems and services	Seawalls, dikes, raising of houses, land reclamation, floating houses, EbA/NbS (ecosystem restoration, green space, urban greening, mangrove plantation)

Methodology

REVIEW	ASSESS	CONSULTATION/WORKSHOPS
<ul style="list-style-type: none"> Review latest adaptation policies, review adaptation-mitigation priorities in four ASEAN countries and related mechanisms/processes (institutional, legal, financial) Analysis of sector/area specific adaptation gaps and challenges Spatial, socio-economic, policy, legal and institutional analysis to assess condition (exposure, vulnerability, mechanism, processes) for the deployment of high 	<ul style="list-style-type: none"> Assess the role of energy systems to resilience building, climate impacts on energy sectors (esp. RE) Analyze adaptation measures/approaches in terms of their relevance for resilient transitioning based on adaptation effectiveness, resilience building, and energy security Survey of adaptation options and measures, and their feasibility or conditions for up-scaling in the long-term Develop/use metrics for assessing co-benefits for resilience building, trade-offs with land-uses, vulnerability of energy systems 	<ul style="list-style-type: none"> Prioritization of technologies/measures/processes of adaptation National and regional interactions and synthesis workshops to co-develop an adaptive process of resilient transition Formulation of resilient transition strategies in the countries

Intended results

- Understand potential contributions of energy system on resilience building
- Understand climate risks on energy-systems and potential de-risking options
- Understand gaps and required conditions for the integration of adaptation priorities and needs into the roadmap development
- Identify key climate risks and potential adaptation measures in the countries
- Estimate adaptation-mitigation synergies and their contributions to net-zero transition through the deployment of identified adaptation measures
- Formulate adaptation/resilience priorities
- Formulation of resilient transition strategies involving RE and energy efficiencies
- Inputs to the roadmap development

Component 3: Resilient transition strategies for the roadmap development

Guiding research question: How can countries develop a useful "long-term roadmap" for resilient transition?

3.1: Develop resilient transition strategies coupled with RE and energy efficiency for their integration into long-term roadmap

3.2: Formulate an iterative approach, such as PDCA cycle, as a part of long-term roadmap development to ensure adaptive process of resilient transition.

2. Government (Session 1)

2.2. Governance

Scoping meeting for the guidance of a national long-term roadmap to synergize mitigation and adaptation in ASEAN countries

Government Session: Introductory presentation

Temuulen Murun
Researcher, Climate and Energy area



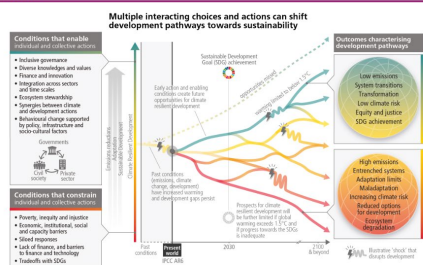
Governance and Institutional arrangements

- Institutional arrangements are policies, systems, processes and structures used by organizations to legislate plan and manage their activities efficiently and to effectively coordinate with others in fulfilling their mandates (UNDP).
- Institutions and governance underpin mitigation and adaptation actions by providing the legal basis, setting up implementing organisations and developing frameworks with stakeholders (IPPC WG3, 2021).
- Three broad processes on how institutions emerge to address climate change (Dubash, 2021):
 - Purpose-built dedicated institutions is focused explicitly (e.g., UK);
 - Layering of objectives on existing institutions (e.g., USA);
 - Latent institutions created for other purposes but have implications (e.g., Brazil)
- Individual country approaches on governing climate change and designing institution structure are vary based on national circumstances.

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2

Governance and institutional arrangements are enablers and barriers



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IPCC WG6 Synthesis report, 2023

3

Key elements in institutional arrangements

Functions:

- Coordination within government (horizontal and vertical)
- Stakeholders engagement (academia, private sectors, civil societies, local communities, NGOs)
- Policy cycle management (risk/vulnerability assessment, long-term model projections, planning, developing, implementing, monitoring, evaluating and feedback)
- Regulatory framework (law, policy and strategy including clear mandates)

Resources:

- Financial resources
- Technological resources
- Human resources
- Data and modelling

Grafalos et al., 2019; Agarwal et al., 2012; Vaughan et al., 2014, UNFCCC 2020; UNEP CCC, 2018; EU Directorate general 2019

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4

Discussion points

- To move toward climate resilient net-zero development, the **role of government and its institutional arrangements/capacity** is one of enabling conditions
- Each **national circumstance is different**; thus, institutional arrangements and legal frameworks should **adopt such conditions**. However, there are **key elements** to enhance institutional arrangements to facilitate the transition
- Expanding renewable energy like solar PV with strong adaptation measures would require better national and sub-national coordination, local community/other stakeholders participation and appropriate policy development based on scientific data
- For this session, ASEAN member countries will share their current status of key national policy and institutional arrangements on synergizing mitigation and adaptation actions

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2.3. Thailand's case



Thailand's Climate Change Policies Landscape

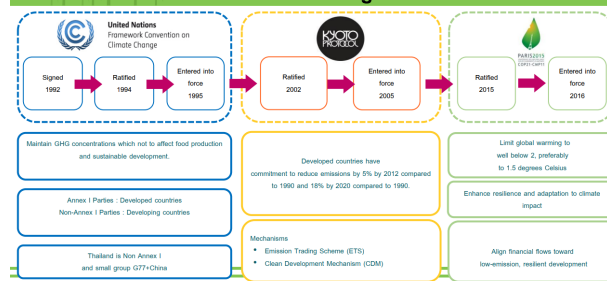
Suriwasa Thanyanattawit

Environmental

Office of Natural Resources and Environmental Policy and Planning (ONEP)

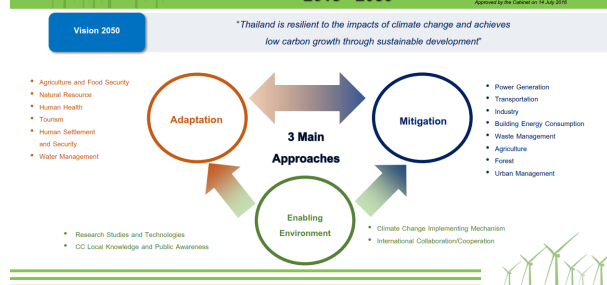
Ministry of Natural Resources and Environment

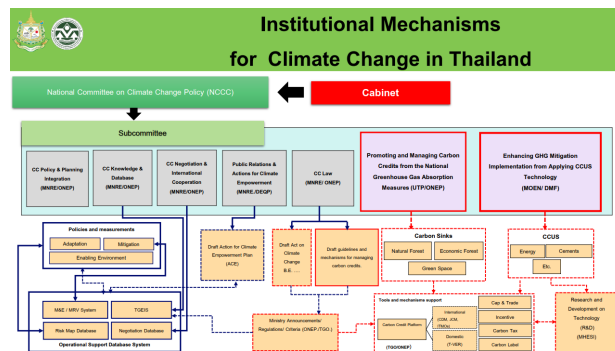
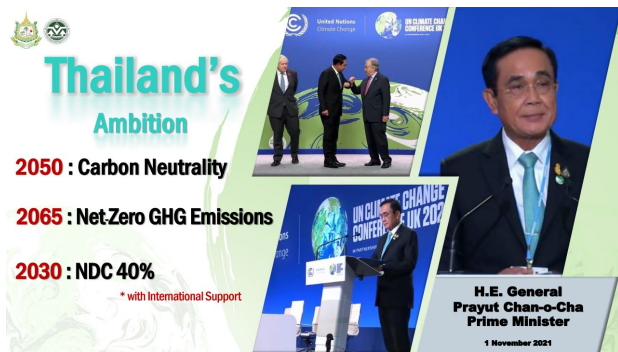
United Nations Framework Convention on Climate Change



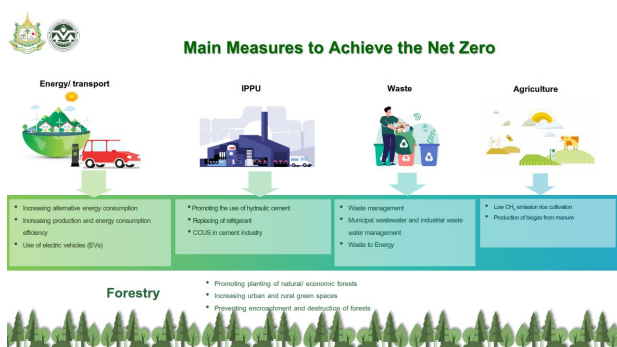
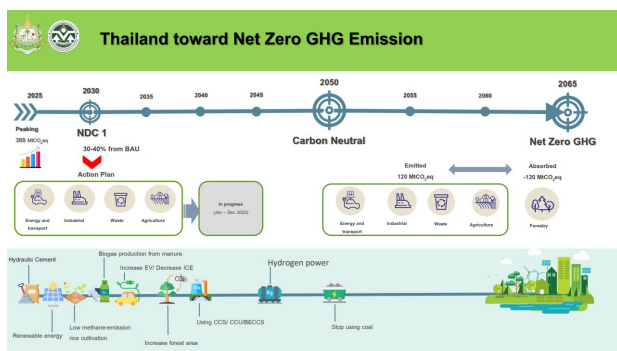
Thailand's Climate Change Master Plan 2015 - 2050

Approved by the Cabinet on 14 July 2015





Contact: unfccc.thailand.focalpoint@gmail.com



3. Think-tank (Session 2)

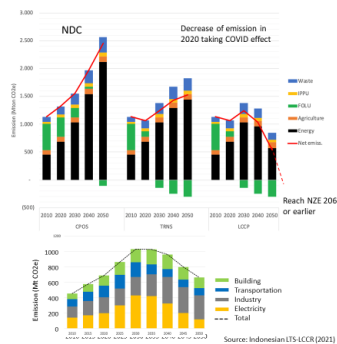
3.2. Indonesia's Case

Extension of Solar Energy and Its Synergy with Adaptation

Rizaldi Boer
Center for Climate Risk and Opportunity Management
IPB University

Introduction

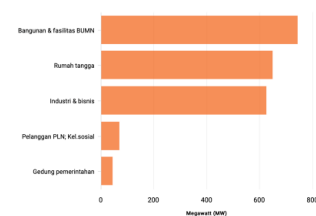
- Avoiding dangerous effect of climate change, the global emission should reach net zero emission (NZE) by 2050 - this is to limit global warming to 1.5°C
- Greenhouse gas emissions must peak before 2025 at the latest and by 2030 the emission is 43% below the 2019 emission level (IPCC) globally
- Timing is very crucial. All developing countries up to 2030 still increase their emission.
- Energy transition play crucial role in meeting the target.



Policy on New and Renewable Energy

- The focus on developing EBT (*New and Renewable Energy*) must be balanced with an increase in energy infrastructure that is more massive and efficient.
- An accelerated program is needed to achieve the **target of 23% by 2025** and focus on implementing EBT which is faster to build with competitive generation costs.
- The Grand National Energy Strategy (GSEN) has mapped the capacity to **add EBT capacity of 38 GW until 2035** through (i) accelerate primary energy substitution, (ii) convert primary energy to fossils, and (iii) increase EBT capacity
- Primary energy substitution: B30-B50, Co-firing, use of RDF; conversion of fossil primary energy, conversion of power plant technology; **EBT installed capacity that focuses on Solar Energy (PLTS)** and utilization of non-electricity/non-biofuels such as briquettes, drying of agricultural products and biogas
- Indonesia is very rich in renewable energy with a **potential of more than 400 GW, 50% of it (207.8 GW) is solar energy potential (RUEN)**. Meanwhile, the utilization of solar energy itself is currently only around 0.15 GW or 0.08% of its potential

Focus of use of solar energy - Solar Rooftop for 2021-2030

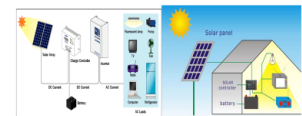


Solar Rooftop (Source: Dirjen EBTKE, 2021)

- Potential to reduce gas/fuel consumption by more than 47 million MMBTU per year;
- Potential to absorb a workforce of 121,500 people;
- Potential to increase investment of IDR 45 to 63.7 trillion for the physical development of PLTS and IDR 2.04 to 4.08 trillion for the procurement of export-import kWh;
- Encourage the green product service sector and green industry;
- Potential to reduce greenhouse gas emissions by 4.58 million tonnes of CO₂e which will contribute directly to achieving the NDC target; And
- Encourage the growth of domestic PLTS supporting industries with higher TKDN values.

Small House Scale Solar Power Generation System Without Connected to the PLN Power Grid (Solar Home System Off Grid)

- Design and build a PLTS technology installation for a simple house
- Increasing people's understanding and skills regarding PLTS technology for simple houses through appropriate technology pamphlets.
- Training on PLTS technology installation and
- Outreach services in the form of assistance and training for PLTS operators in partner communities



Installation of Solar Home System (Mini PLTS) for houses in village

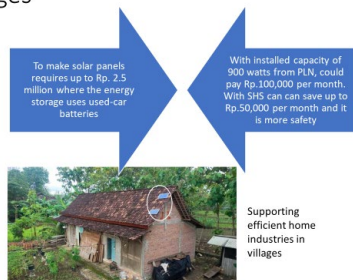


Source: Agus Haris, 2021

Solar Rooftop in Villages



Panel Source: Dirjen EBTKE, Yogyakarta, 2020. Wikimedia.com



Use of Solar Energy for Meeting Light in Fishing Boat

- Electrical energy with a capacity of 80 Watt peak (Wp) solar panels can produce 400-750 Wh of electricity per day. It can meet the power demand for 3 lamps in a fishing boat with a capacity of 5 W for a whole day
- The installation of PLTS on fishing boats is expected to provide many benefits to fishermen, among others (i) Reducing ship operating costs, (ii) Maintain environmental sustainability, (iii) Improve sanitation on board; (iv) Improving the health of crew members; (v) Reducing accidents on ships; (vi) Reducing fire events, (vii) Improve the security system on the ship; (viii) Providing a sense of security for crew members.



Gambar 2. Pemasangan PLTS

Source: Nugraha et al. 2021

Source of Photo: <http://www.energiespot.com>

- Fishing Boat normally operates 3 generators (2 generators for sailing and 1 for light) - use up to 140 liters of diesel for one sail, which is a week in the sea.
- With Solar Energy, fishermen can save expenses up to Rp.1.12 million in sail (saving from buying diesel which is Rp.8,000 per liter)
- A total of 15 solar panels fill the roof of the boat, equipped with LED lights on each side that are directed outside the ship. The goal is to make it easier for the fishermen to catch fish

Tim detikBali - detikBali

- The output produced from the well pump is 4.4 m³/second, and the water that is channelled to the household canal is equipped with a meter.
- After installing the PLTS, electricity payments for pump operations, decreased from Rp.12 million per month to Rp.8 million per month.
- Managing clean water shortage for communities with increasing use of spring water, river, ground water with the use of energy from solar for pumping and water distribution



Solar energy for irrigating rice field



Source: Muhamad Fajar Riyandanu, 2022
<https://katadata.co.id/happylajiar/ekonomi-hijau/62ce60917melinnah-listrik-terasa-surva-di-tanah-lima>

- Farmers at Desa Kaliurip spending for fuel of water pumping Rp25,000 per hour; For irrigating rice field a day needs to operate pumping for at least seven hours. The cost is even more expensive for residents who don't have a diesel pump as they have to pay rent of the pump facility.
- A total of 144 solar panels, each with a capacity of 310 watts/peak can support 2,100 farmers in Kaliurip Village, Purwosari District, Banyumas Regency, Central Java.
- The solar power plant (PLTS) functions to turn on the water pump to irrigate the fields – each farmers who get benefit from this will pay with rice at harvesting time (10 kg of rice for every 70 m² of land) – equivalent to 15%-20% of total yield.
- This effective for managing drought and can increase planting intensity → increase production



Source: Rimbawati, 2021

- Ecotourist areas “rice field tourism” – With Solar Energy (PLTS) - reduce the cost of purchasing electrical energy at Desa Pematang Johar, kecamatan Labuhan Deli Kabupaten Deli Serdang
- PLTS with a capacity of 3500 WP can increase the income of tourist object managers of IDR 3,000,000/month. It can substitute 85% of energy needs
- Before the existence of PLTS the manager had to pay an electricity bill of IDR 4,000,000/month to meet energy needs
- Increase income and reduce poverty → reduce vulnerability

- Solar energy is abundant in tropical countries and its utilization is still very low
- Extension use of solar energy in urban and villages will contribute to the process of energy transition and climate change adaptation
 - Reduce poverty by opening more job opportunities, reducing expenses for energy, increase income → increase resiliency
 - Increase capacity to manage extreme climate (e.g. drought risk), etc
- The main barrier for solar energy is high initial investment and capacity
 - Need subsidy from government (access to fund for investment)
 - Public, Private Partnership → Climate Village program
 - Increase awareness and technical capacity for maintenance
 - Open link to carbon market

Highlights from scientific communities on mitigation, adaptation, or integrated area & expectations for the long-term roadmap toward a resilient net-zero country

The Philippines Case

Damasa B. Magcale-Macandog
 Paper presented at Scoping Meeting on the ASEAN Climate Change Strategic Action Plan 2023-2030 (ACCSAP), 29 March 2023

A horizontal timeline illustrating the evolution of Philippine climate change laws and policies from 1970 to 2020. The timeline is marked with green circles representing key legislative acts and executive orders. The events are as follows:

- 1970:** PD 1566 : NATIONAL DISASTER COORDINATING COUNCIL.
- 1990:** PHILIPPINE AGENDA 21.
- 1991:** REPUBLIC ACT NO. 7160 LOCAL GOVERNMENT CODE OF 1991.
- 2000:** REPUBLIC ACT NO. 8749 PHILIPPINE CLEAN AIR ACT.
- 2007:** PRESIDENTIAL TASK FORCE ON CLIMATE CHANGE.2007.
- 2009:** REPUBLIC ACT NO. 9729 CLIMATE CHANGE ACT OF 2009.
- 2010:** REPUBLIC ACT NO. 10121 PHILIPPINE DISASTER RISK REDUCTION AND MANAGEMENT ACT.
- 2014:** EXECUTIVE ORDER NO. 174, S. 2014 (Institutionalizing Philippine Greenhouse Gas Inventory Management and Reporting System).

PHILIPPINE NATIONAL CLIMATE CHANGE ACTION PLAN (2011-2028)
7 STRATEGIC PRIORITIES

- Food Security
- Water Security
- Ecological and Environmental Stability
- Human Security
- Climate Resilient Industries and Services
- Sustainable Energy
- Resilience and Capacity Development

NATIONAL CLIMATE CHANGE ACTION PLAN 2011-2028

Intermediate Outcomes

- Enhanced adaptive capacity of communities, resilience of natural ecosystems, and sustainability of food environment to climate change.
- Sustainable livelihoods
- Sustainable climate smart development

Ultimate Outcomes

Within the Framework, the country developed a National Climate Change Action Plan (NCCAP) that outlines a long-term program and strategies for climate change adaptation with the national development plan focused on identified seven (7) thematic priority areas.

Green Cross Corporation, Inc. | Beyond Green: Change the NGOs, January 2018. from <https://www.greencc.com.ph/about-us/mission-vision-and-values/> - Task Outcome?

AMBISYON NATIN 2040

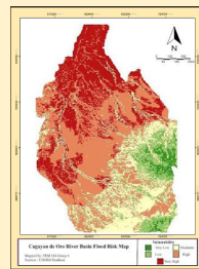


Represents the collective long-term vision and aspirations of the Filipino people for themselves and for the country in the next 25 years. It necessitates inter-generational equity, is consistent with the core principles of the SDGs of sustainable development.

A picture of the future, a set of life goals and goals for the country. It is different from a plan, which defines the strategies to achieve the goals. It is like a destination that answers the question "Where do we want to be?"

National Economic and Development Authority. (2022, April 24). *SDGs and Ambisyon Natin 2040*. Retrieved March 27, 2023, from <https://neda.gov.ph/sdgs-and-ambisyon-natin-2040/>

Highlights: Forestry



Watershed Modelling

(Project: Nationwide Operational Assessment of Hazards)

The Philippines' official programme of disaster mitigation is Project NOAH. This programme mainly uses two models from the Hydrologic Engineering Center (HEC): the **Hydrologic Modeling System (HMS)** for watershed modelling, and the River Analysis System (RAS) for flood modelling.

Benavides, R., Jackson, B., Harwood, D., Semp, P., et al. (2016). Improving predictions of the effects of extreme events, land use, and climate change on the hydrology of watersheds in the Philippines. *Proceedings of the International Association of Hydrological Sciences*, 375, 143–151. <https://doi.org/10.1016/j.probs.2016.143.016>

Highlights: Agriculture

Climate Smart Agriculture

The project provides the Philippines' most effective crops for each region (www.farmersguidemap.gov.ph), along with locations with shallow water tables. It also lists the fertilizers required to make up for the soil's deficiency in nutrients as well as the community's rate of poverty.



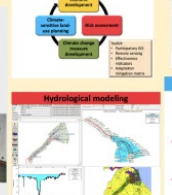
Perkins, T. R. (2020, July 10). *Climate-smart agriculture initiatives in the Philippines*. *IFPRI Agricultural Policy Platform (APP)*. Retrieved March 27, 2023, from <https://app.ifpri.org/locations/CT-AP-Climate-Smart-Agriculture-Initiatives-in-the-Philippines>

Highlights: Integrated Watershed Management for CC Adaptation and Disaster Risk Reduction

Vulnerability Assessments



Mapping current & future land-use



Improving Comprehensive Land-use Plan (CLUP)



Highlights: Agriculture

THE PARMAP WEB PORTAL

is NOW ONLINE



Climate Smart Agriculture

(Project: DREAM and Phil-LIDAR Coverage Mapping)

The Agricultural Resources Extraction from LIDAR Surveys (PARMap) of the Nationwide Detailed Resources Assessment using LIDAR (Phil-LIDAR 2). PARMap Web Portal serves a repository and archive of agricultural land cover maps and shapefiles based on available LIDAR datasets.

Provided detailed resource maps of major agricultural crops - rice, corn, coconut - at the barangay level for local government land use planning, food production and disaster risk reduction management.

Harwood, D. (2017, March 13). *Phil-LIDAR 2*. *Philippines: National Economic and Development Authority (NEDA)*. Retrieved March 27, 2023, from <https://neda.gov.ph/phil-lidar-2-philippines>

Highlights: Solid Waste Management



Healthy Oceans and Clean Cities Initiative

Developed by UN-Habitat Philippines and supported by the Government of Japan, the Healthy Oceans and Clean Cities Initiative (HOCCI) aims to reduce marine plastic pollution. The National Plan of Action for the Prevention, Reduction, and Management of Marine Litter (NPOA-ML) of the Philippines and the improvement of data collection and waste management systems are two ways that HOCCI seeks to eliminate marine plastic litter.

UN-Habitat Philippines. (2022, February 17). *Healthy Oceans and Clean Cities Initiative*. UN-Habitat Philippines. Retrieved March 27, 2023, from <https://unhabitat.org/healthy-oceans-and-clean-cities-initiative/>

Highlights: Agriculture



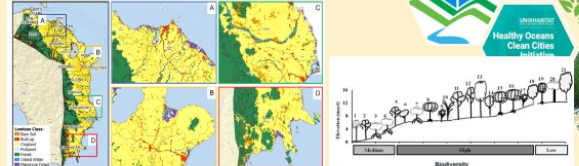
Climate Smart Agriculture

(Project: Smarter Approaches to Revitalize Agriculture as an Industry)

Project SARAI aims to craft crop advisories which are targeted for rice, corn, banana, coconut, coffee, cacao, sugarcane, soybean, and tomato. The crop advisories focus on integrating local weather data and drought forecast with farm management activities, specifically nutrient and water management, and proactive pest and disease monitoring.

DOEP-PSAIBRD. (n.d.). *Project SARAI: Smarter Approaches to Revitalize Agriculture as an Industry in the Philippines*. Project Sarai. Retrieved March 28, 2023, from <https://www.unhdp.org/unhdp/en/psaibrd>

Highlights: Coastal Resources



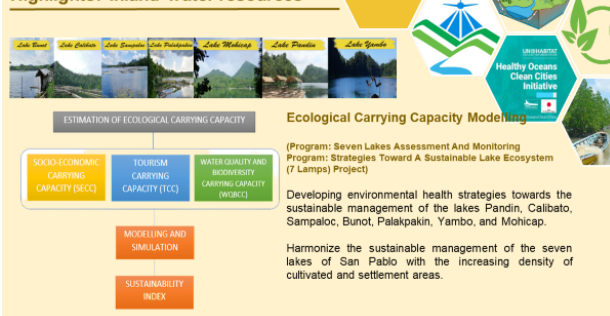
APNIS - ORIENTAL MINDORO PROJECT

(Project: Possible alternative futures of island mangroves in the Asia-Pacific: Scenario-based analysis and quantification of mangrove ecosystem services in coastal hazard mitigation and climate change adaptation)

A scenario-based quantitative assessment of mangrove ecosystem services for evidence-led decision-making and establishing a strong science-policy interface for policy making. By developing future scenarios, the project will make quantitative, spatiotemporal evaluation of vital mangrove ecosystem services, with respect to climate change and hazard mitigation.

Asia-Pacific Network for Global Change Research. (n.d.). *Possible alternative futures of island mangroves in the Asia-Pacific: Scenario-based analysis and quantification of mangrove ecosystem services in coastal hazard mitigation and climate change adaptation*. Asia-Pacific Network for Global Change Research.

Highlights: Inland water resources



Scientific inputs into the national long-term roadmap

NCRP - NCRP COLLABORATES WITH CONGRESS TO PROMOTE POLICY-MAKING BASED ON SCIENCE

DENR-EMB conducts final consultation on Extended Producer Responsibility Act of 2022

REPUBLIC ACT No. 1067
AN ACT TO INTEGRATE, COORDINATE, AND INTENSIFY SCIENTIFIC AND TECHNOLOGICAL RESEARCH AND DEVELOPMENT AND TO FOSTER INVENTION, TO PROVIDE FUNDS THEREFOR, AND FOR OTHER PURPOSES.

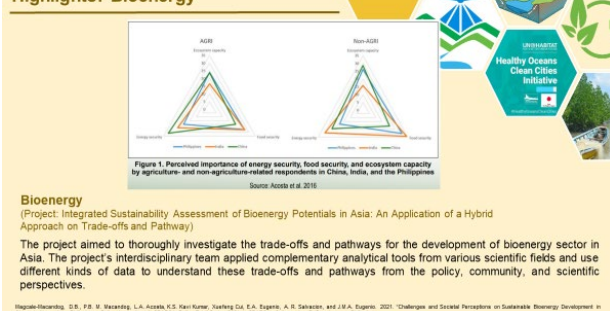
Section 1. This Act shall be known as the "Science Act of 1998."

Section 2. In consonance with the provisions of section four, Article XVI of the Constitution, it is hereby declared to be the policy of the state to promote scientific and technological research and development, foster invention, and utilize scientific knowledge as an effective instrument for the promotion of national progress.

Section 3. In the implementation of the foregoing policy, the Government shall, in accordance with the provisions of this Act:

(1) Stimulate and guide scientific, engineering and technological efforts towards filling the basic and immediate needs of the people;

Highlights: Bioenergy



Linking Science and Policy for Climate Change Adaptation & Disaster Risk Reduction

Expectations and Desires

- Create stronger science-policy interface by combining bottom-up efforts of LGUs and top-down coordination.
- Invite Local Government Unit (LGU) to learning fora and presentations.
- Apply methodology to other locations and harmonize it to its scale.
- Technical workshops for capacity building of technical staff.
- Institutionalization of beneficial science based programs.
- Enable agencies to apply these approaches by themselves in the future.

Highlights: Education and Information Campaign

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF EDUCATION

CURATED RESOURCES FOR TEACHING CLIMATE CHANGE

LESSON PLAN

- Global Climate Change Education Modules
- Climate Change Education Across the Curricula, Across the Globe
- Shaping Our Future
- Climate Change
- The Climate Plate

Provides students information on ecosystem services, climate change and global warming issues, and the impacts of climate change and anthropogenic activities on our ecosystems. The national climate change adaptation and mitigation plans, policies and measures will also be another focus.

Linking Science and Communities for Climate Change Adaptation & Disaster Risk Reduction

Expectations and Desires

- Lifestyle changes
- Active Community participation
- Harness innovation from local knowledge.
- Communicate scientific findings to a platform that the general community have access to and can easily understand.
- Domesticating science based projects to the community to enable them to continue them by themselves.
- Narrow down research and community gap

Highlights: Urban Landscapes

International Academic Consortium for Sustainable Cities (IACSC) Collaborative Activities Toward Climate-Proof Asian Cities

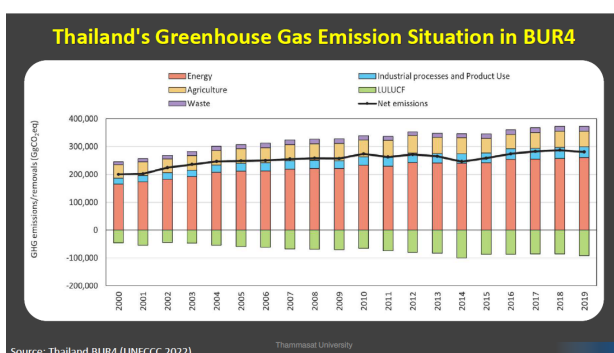
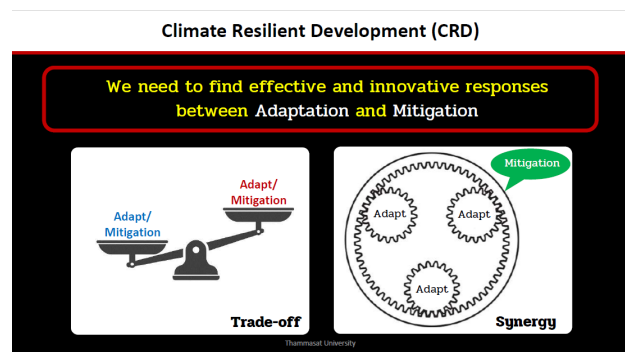
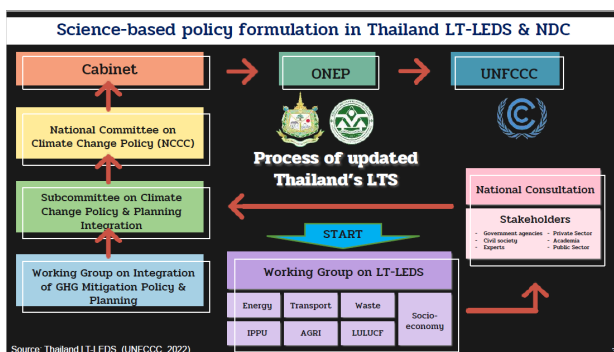
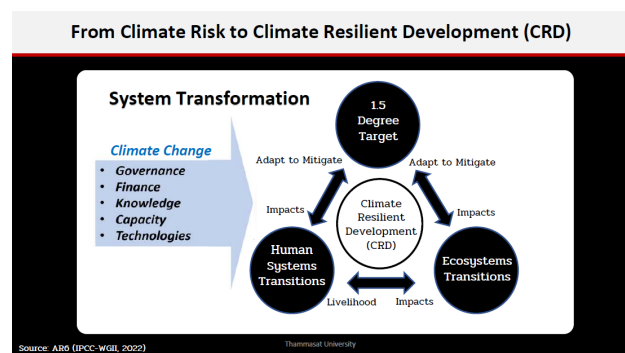
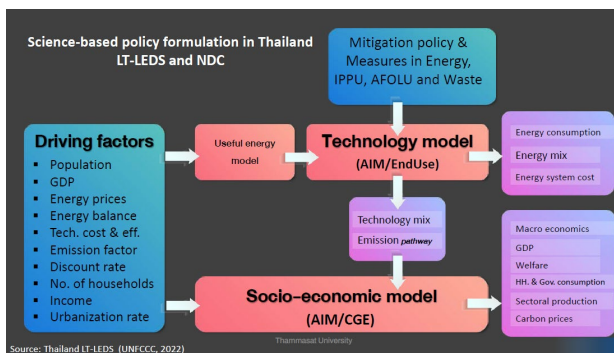
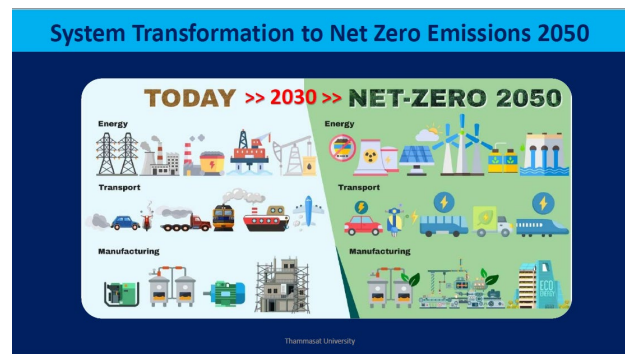
(Programs: Sustainable Urban Development Program (SUDP), Yokohama Urban Solutions Study (YUSS)).

To develop cooperation, to foster dialogues and discussions, to encourage sharing of information and resources and to promote research and collaborative activities among academic and research institutions as well as to strengthen relationship among universities and cities to contribute to a sustainable society.

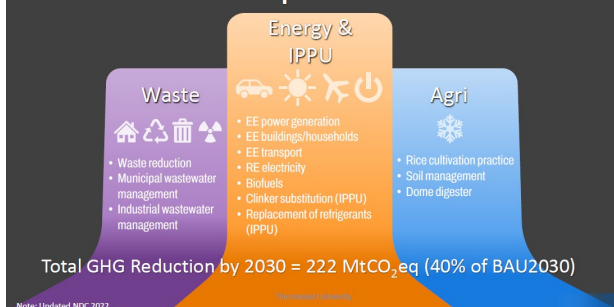
Yokohama City University. 2022, January 24. International Academic Consortium for Sustainable Cities (IACSC). Yokohama City University. Retrieved March 27, 2023. from <https://www.yokohama-cu.ac.jp/en/urban/program/yuss/>

THANK YOU

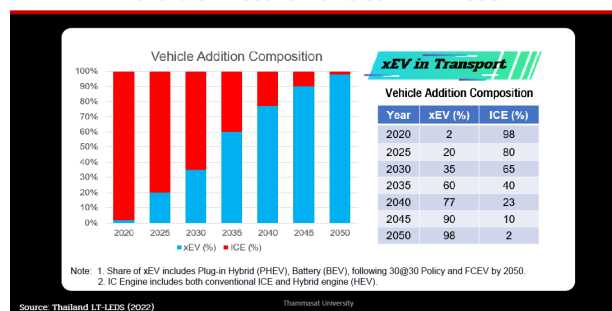
3.4. Thailand's Case



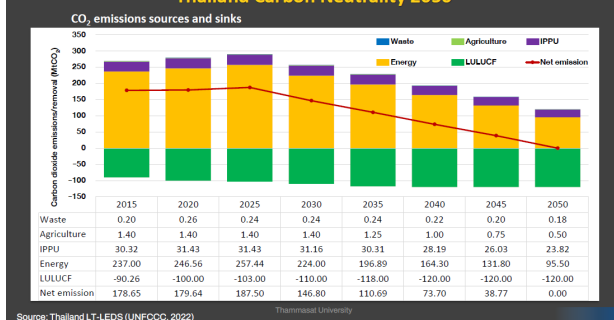
Thailand's updated NDC 2022



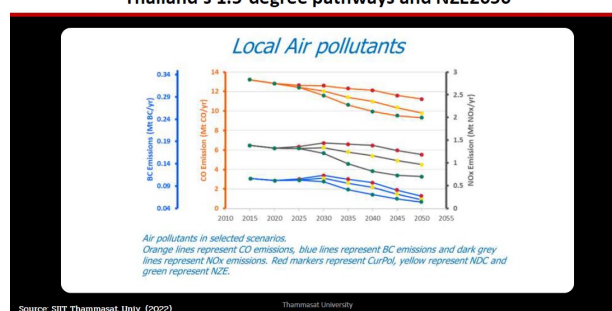
Share of Electric Vehicles in NZE2050



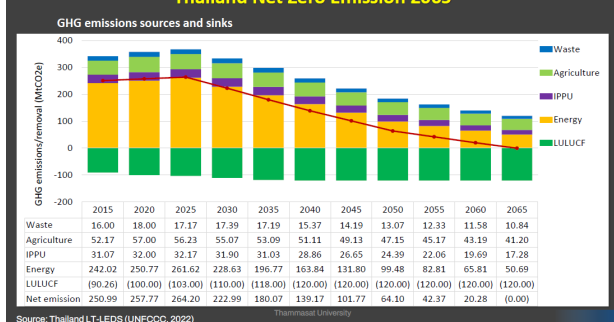
Thailand Carbon Neutrality 2050



Thailand's 1.5-degree pathways and NZE2050



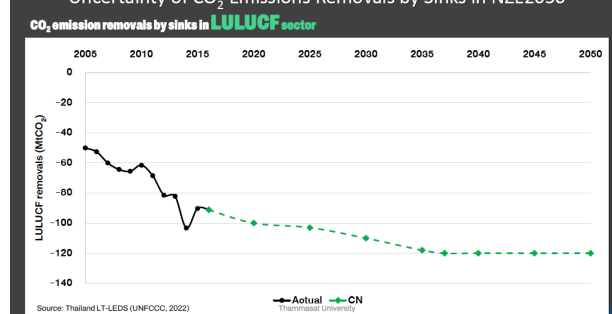
Thailand Net Zero Emission 2065



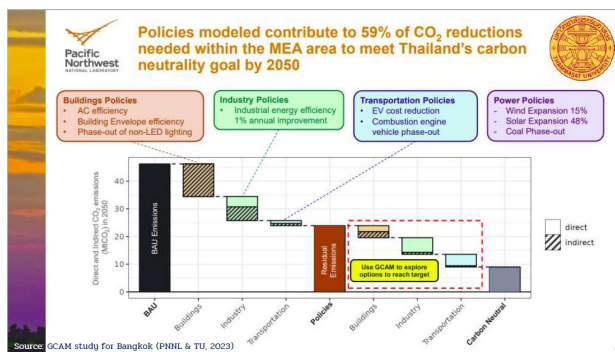
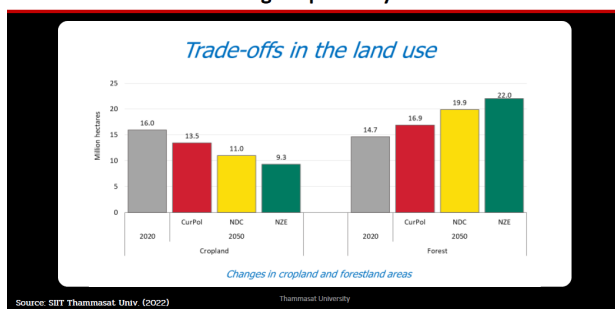
People need to change their behavior for NZE2050



Solar PV in NZE

Uncertainty of CO₂ Emissions Removals by Sinks in NZE2050

Thailand's 1.5-degree pathways and NZE2050



3.5. AIM Development and Application

This research was performed by the Environment Research and Technology Fund (JPMERF20192008 and JPMERF20221002) of the Environmental Restoration and Conservation Agency of Japan.

Development and Application of AIM to Realize Decarbonized Society -For Decision Making Based on Scientific Knowledge-

Toshihiko Masui
(masui@nies.go.jp)
National Institute for Environmental Studies, Japan

Scoping Meeting on the ASEAN Climate Change Strategic Action Plan 2023-2030 (ACCSAP) & Guidance for National Long-term Roadmap to Synergize Mitigation and Adaptation

Online
March 29, 2023

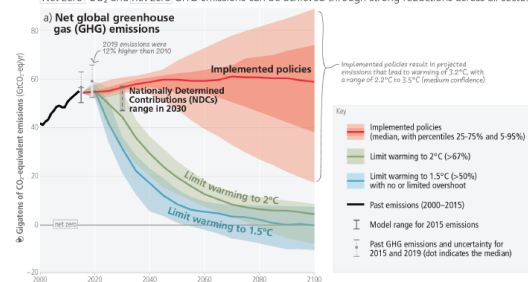
AIM Asia-Pacific Integrated Model
<http://www-iam.nies.go.jp/aim/index.html>

NIES JAPAN

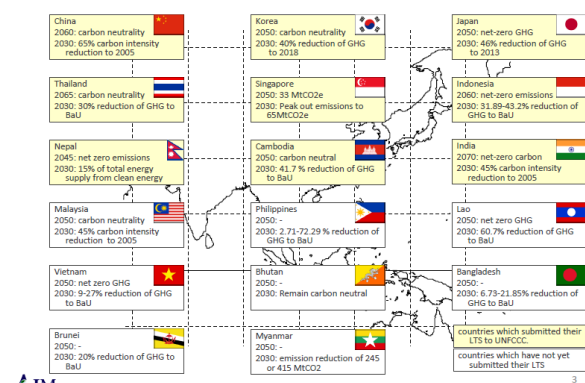
From IPCC AR6: We agreed with Paris Agreement, but to achieve 1.5°C target, more drastic and immediate global GHGs reduction is needed.

Limiting warming to 1.5°C and 2°C involves rapid, deep and in most cases immediate greenhouse gas emission reductions

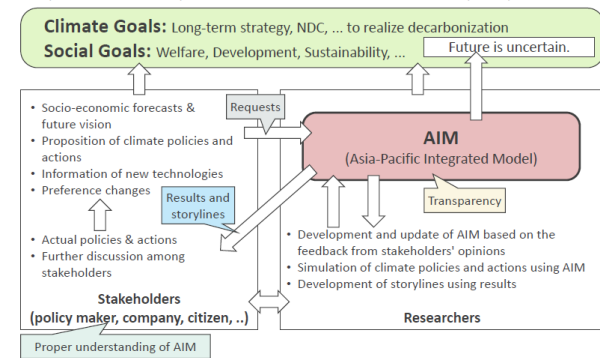
Net zero CO₂ and net zero GHG emissions can be achieved through strong reductions across all sectors



NDC and LTS of some Asian countries



How to realize decarbonized society and roles of the AIM? Importance of cooperation between researchers and policy makers

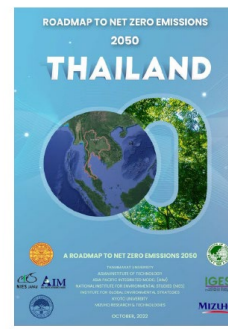


AIM

4

Thailand

Prof. Bundit Limmeechokchai
 (Sirindhorn International Institute of Technology, Thammasat University)
 Roadmap to net zero emissions 2050 Thailand



https://www.iam-nies.go.jp/aim/pdf/Thailand_Net_Zero_2050_Roadmap.pdf

AIM

7

International Network of AIM (Asia-Pacific Integrated Model)

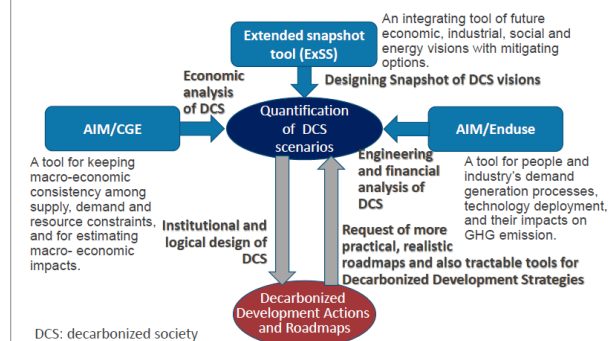


- Asian countries will update their mitigation target and roadmap to achieve the 1.5/2 degree target reflecting their issues to be solved and the resources to be endowed.
- Model can be a collaboration tool between science and decision making process. From the long-term viewpoint, each country will need the capacities to develop model and scenarios by itself.
- AIM (Asia-Pacific Integrated Model) has supported Asian countries to develop the integrated assessment model (IAM) and their long-term low carbon/decarbonized scenarios.
- <https://www.iam-nies.go.jp/aim/index.html>

AIM

5

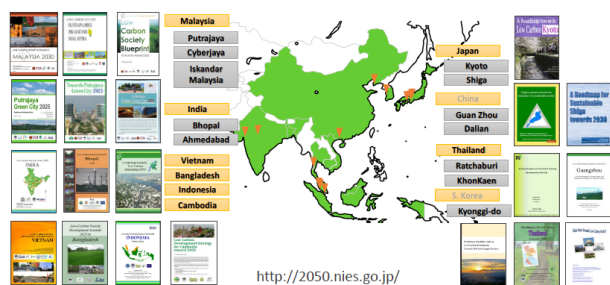
Framework to assess decarbonized society actions and socio-economic policies using AIM in developing countries



AIM

8

Examples of Asian Low Carbon Scenarios Communication and feedbacks of LCS study to real world

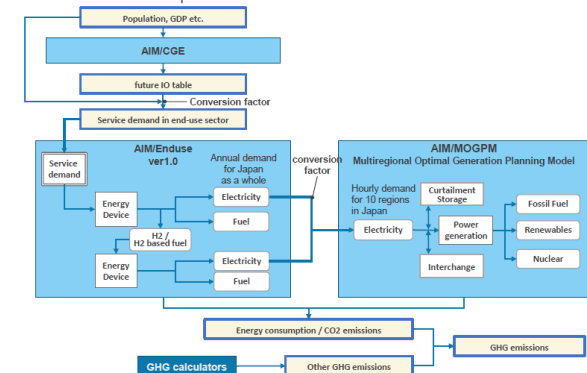


We need to change goal from low carbon to decarbonization.
 More practical and ambitious scenarios are requested.

AIM

6

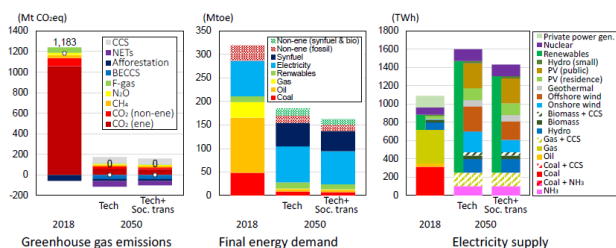
Framework using AIM to assess the net-zero GHG emissions in Japan



AIM

9

Quantification of decarbonized society in 2050 in Japan



- "Technology" scenario: net-zero emissions are achieved through deploying a wide range of the decarbonized/low carbon technologies.
- "Technology + social transformation" scenario: In addition to the "Technology" scenario, the social transformation is assumed. The social transformation reduces the energy service demand with the help of the progress of digitalization and circular economy.

AIM

10

Indonesia
Long-term strategy for Low Carbon and Climate Resilience 2050

Prof. Rizaldi Boer
(Bogor Agricultural University)
Prof. Retno Gumilang Dewi and
Dr. Ukok WR. Siagian
(Bandung Institute of Technology)



https://unfccc.int/sites/default/files/resource/Indonesia_LTS-LCCR_2021.pdf

4.1. Scenario Development

4.1.1. Models for Mitigation Pathways

Indonesia used a set of models in developing the emission pathways with two stages of analysis. In the first stage, separate models were developed for modelling agriculture, forestry and other land uses (AFOLU), and energy. The AFOLU sector used AFOLU Dashboard (a spreadsheet model), meanwhile energy sector used AIM-Enduse and the AIM-ExE (Extended Snapshots). In both models, economic and population growth are the key drivers for changes in food and energy demand. In the second stage, the economic and economic impact of both AFOLU and energy sector mitigation are analysed by utilising the Asia Pacific Integrated Model/Computable General Equilibrium (AIM/COE-Indonesia) (see Figure 3).

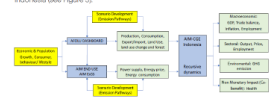
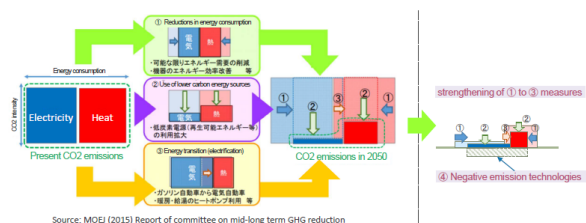


Figure 3. Models for developing emission pathways in Indonesia

13

Necessary actions to achieve decarbonized society

- Major directions toward low carbon society: ① **Reductions in energy consumption**; ② **Use of lower carbon energy sources**; and ③ **Energy transition (electrification)**.
- To achieve carbon neutrality, in addition to ① – ③ measures, ④ **Negative emission technologies** will be needed.
- Moreover, role of ⑤ **Social transformation** will be important to realize carbon neutrality.



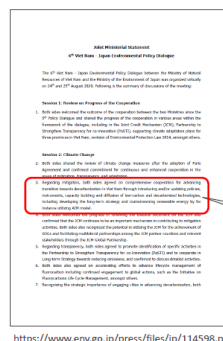
Source: MOEJ (2015) Report of committee on mid-long term GHG reduction

AIM

11

Vietnam

Joint Ministerial Statement: 6th Viet Nam - Japan Environmental Policy Dialogue



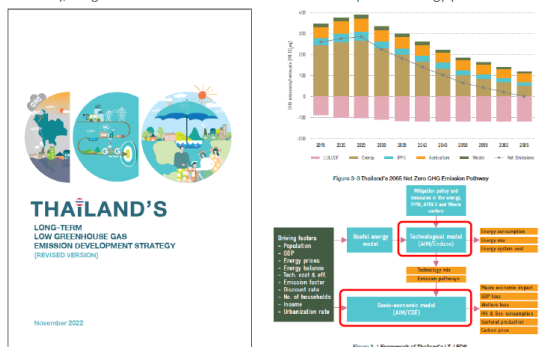
<https://www.env.go.jp/press/files/jp/114598.pdf>

Regarding mitigation, both sides agreed on comprehensive cooperation for advancing transition towards decarbonization in Viet Nam through introducing and/or updating policies, instruments, capacity building and diffusion of low-carbon and decarbonized technologies, including developing the long-term strategy and mainstreaming renewable energy by for instance utilizing AIM model.

14

Thailand

Mid-century, Long-term Low Greenhouse Gas Emission Development Strategy (Revised Version)



https://unfccc.int/sites/default/files/resource/Thailand%20LT-LEDS%20Revised%20Version%29_08Nov2022.pdf

AIM

12

Training Workshop to introduce AIM

- Jan. 30-Feb. 1 2017, SIIT-TU, Thailand
- Bhutan, Cambodia, China, Indonesia, Korea, Malaysia, Nepal, Thailand, Vietnam



15

Training workshops in Asia for capacity development



Online AIM training workshop was held during Covid-19 pandemic periods



- September 27-19, 2023; collaborating with LoCARNet and Center for Climate Change Adaptation in NIES.
- Target models: ExSS, Enduse, CGE and tools to assess climate change impact & adaptation
- Target trainees: policy makers and beginners on model analysis.



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Collaboration to support climate policy in ASEAN countries; Example of Indonesia



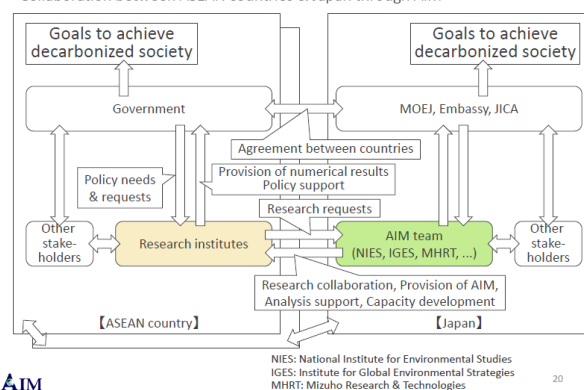
To update AIM and quantitative scenarios to achieve net-zero GHG by 2060 in Indonesia, NIES hosted young researchers from Dec 2022 to Feb 2023, and set the meeting to exchange views with Ministry of Environment on January 27 2023. In addition, NIES has been accepting post doctoral researchers and PhD students from Thailand, Indonesia and Lao collaborative with Tokyo Institute of Technology.



19

To achieve decarbonized society

Collaboration between ASEAN countries & Japan through AIM



20

Collaboration to support climate policy in ASEAN countries; Example of Thailand

- On October 30, 2019, Policy dialogue meeting was held in Bangkok, MOEJ explained the Japan's long-term strategy and AIM team explained the overall of AIM and scenario analysis using AIM.
- Not only national government but also local government and private sectors attended.



18

If you are interested in AIM,

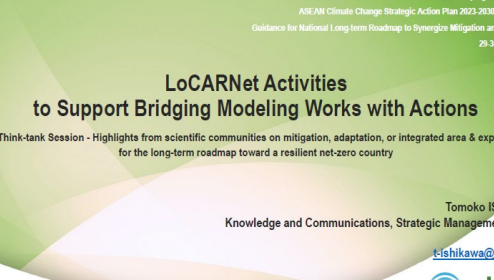
if you want to utilize AIM to assess decarbonization scenarios, and

if you want to attend the 29th AIM International Workshop (Sep. 14 & 15, 2023) and training workshop,

please contact me (masui@nies.go.jp).



21





Scoping Meeting on the
ASEAN Climate Change Strategic Action Plan 2023-2030 (ACCSAP) &
Guidance for National Long-term Roadmap to Synergies Mitigation and Adaptation
25-30 March 2023

LoCARNet Activities to Support Bridging Modeling Works with Actions

#2: Think-tank Session - Highlights from scientific communities on mitigation, adaptation, or integrated area & expectations
for the long-term roadmap toward a resilient net-zero country

Tomoko ISHIKAWA
Knowledge and Communications, Strategic Management Office
IGES
t-ishikawa@iges.or.jp

[illegible]

S-P dialogue with Indonesia MOEF, MEMR and DKI Jakarta (27 Feb. 2020)

S-P dialogue with MONRE, ONEP and TGO (30 Oct. 2019)

S-P dialogue with Malaysia NREGO (16 Mar. 2023)

AIM Training Workshop at SBH, Thammasat University, Thailand in 2017

**AIM Training Workshop
SBH-TV, Thailand
January 16 - February 1, 2018**

Contribution to the development of mid-/long-term GHG emissions reduction scenario analyses in Indonesia Energy Sector
AIM-CEE, AIM E&E Unit, AIM CEE

Update of National Energy Policy (NREAP) and NREAP Roadmap (Under Preparation)

MoEF, MEMRI, MoU

Low Carbon Development Strategy of Indonesia (2019), OGEI Indonesia (2019), and Indonesia (2019) (Indonesia)

Education and Life-Cycle Analysis Map of Oil and Gas, Pulp and Paper Industries

Decarbonization Road Map of Oil and Gas, Pulp and Paper Industries

Nations and Sub-National

UNFCCC COP26 Glasgow 2021

Rattana Foundation Energy Council (RFEC)

Master Degree Thesis Academic Publications

Company / Business

Source: Presentation by Indonesia AIM team (IPB and ITB joint team, Jan., 2023)

Timeline of the Vietnam-Japan Partnership for a Resilient and Sustainable Future (2020-2023)

- Aug. 2020:** Viet Nam MONRE and MOEJ agreed on comprehensive cooperation for advancing transition towards decarbonisation in Viet Nam incl. developing LUs by utilising AIM
- Nov. 2021:** PM Chinh declared targeting carbon emissions neutrality by 2050 at COP26
- Nov. 2021 (After COP26):** Two ministers signed the Joint Cooperation Plan on Climate Change towards Carbon Neutrality by 2050
- Apr. 2021 – Mar. 2022:** AIM team conducted modeling works
- Mar. 2022:** AIM team submitted the final report to MONRE
- Apr. 2021 – May 2022:** 8 consultation meetings were held between Viet Nam and Japan
- Apr. 2022:** MONRE released their draft National Climate Change Strategy (NCCS) to donors, mentioned AIM's contribution to NCCS at the consultation workshop on NCCS
- Jul. 2022:** NCCS was approved (Decision No. 896/QĐ-TTg)
- Jul. 2022 – Mar. 2023:** Conducted on-line training sessions

1. **AIM training workshop** (Short training course, 27-29 Sept. 2022, for policymakers, practitioners (and researchers))
16 participants (Bhutan: 1, Cambodia: 7, India: 3, Indonesia: 2, Laos: 1, Mongolia: 1, Viet Nam: 1)

2-1. **AIM/CGE training sessions** (20 lectures, Jul.-Sept. 2022, for researchers (basic level)), organised by NIES

2-2. **AIM/ExSS and AIM/Enduse training sessions** (13 lectures – 2 AIM/ExSS sessions and 11 AIM/Enduse sessions, Jan.-Mar. 2023, for researchers)
60 registrations (Bangladesh: 6, Cambodia: 3, China: 11, India: 6, Indonesia: 1, Korea: 8, Taiwan: 16, Thailand: 5, Viet Nam: 2, Japan: 1, Not stated: 1)

1 st session	16 April 2021	AIM team shared collected data and requested MONRE for additional information
2 nd session	31 May 2021	AIM team presented analysis results on CO2 peak-out years
3 rd session	5 July 2021	AIM team presented updated analysis results on CO2 peak-out years / submitted draft report on analysis results on CO2 peak-out years
4 th session	30 July 2021	AIM team presented analysis results on technology-fixed scenario and countermeasure scenario / submitted report on analysis results on CO2 peak-out years
5 th session	1 December 2021	AIM team reported analysis results on 2050 CO2 net-zero
6 th session	21 December 2021	AIM team and MONRE discussed calculation conditions on 2050 GHG net-zero
7 th session	18 February 2022	AIM team reported analysis results on 2050 GHG net-zero
8 th session	13 May 2022	MONRE referred NCCS as 'joint work' between Japan and Viet Nam / acknowledged Japan's contributions

2017 Bangkok

2018 Jakarta

2020, 2021, 2022 Online

FY2023 LoCARNet meeting
September 2023
In conjunction with AIM International WS

Thank you for your attention
ご清聴ありがとうございました

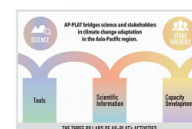
IGES Institute for Global Environmental Strategies
公益財団法人 地球環境戦略研究機関

AP-PLAT's Approach

- Actively promote partnerships with national and local governments, relevant organizations and the private sector in the Asia-Pacific region

- Develop 3 pillars of AP-PLAT activities:

- Tools
- Scientific Information
- Capacity Development



- Analyze adaptation needs and promote collaboration with existing initiatives in the region

ASEAN Scoping Workshop, 29 March 2023

3.7. AP-PLAT and Its Contribution

AP-PLAT and its potential contribution to the long-term roadmap toward climate-resilient Southeast Asia

Slavka Sakata / Yuji Masutomi

Center for Climate Change Adaptation (CCCA),
National Institute for Environmental Studies (NIES)



Guiding Question

How can AP-PLAT contribute to:

- the development of a **long-term** climate-resilient net-zero transition roadmap that avoids unsustainable lock-ins
- promoting **synergies** between adaptation and mitigation

AP-PLAT can offer:

- **Scientific information and tools** for impact assessment and simulations
- **Capacity development resources** – E-learning materials, guidebooks ...
- **Network** of supporting organizations and partner organizations

AP-PLAT is in a unique position to **bring in knowhow from diverse players**.



AP-PLAT Framework for Action 2023-2025



Strategy for AP-PLAT Capacity Development Program 2023-2025



- Documents adopted in March 2023 by MOEJ, IGES and NIES

- Published on AP-PLAT website ("About")
<https://ap-plat.nies.go.jp/about/index.html>

ASEAN Scoping Workshop, 29 March 2023

AP-PLAT Supporting organizations



ASEAN Scoping Workshop, 29 March 2023

What is AP-PLAT?

- **Asia-Pacific Climate Change Adaptation Information Platform**

- Established in 2019

- Operated by:

- Ministry of Environment Japan (MOEJ)
- National Institute for Environmental Studies (NIES)
- Institute for Global Environmental Strategies (IGES)

- Mission: to **support science-based decision making and effective climate change adaptation measures in Asia-Pacific**



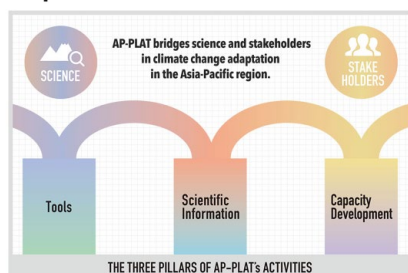
ASEAN Scoping Workshop, 29 March 2023

AP-PLAT Capacity development partner organizations



ASEAN Scoping Workshop, 29 March 2023

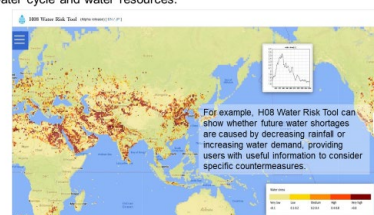
3 pillars of AP-PLAT's activities



ASEAN Scoping Workshop, 29 March 2023

H08 Water Risk Tool

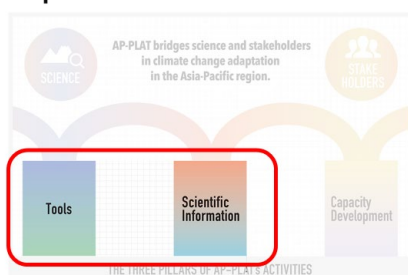
A global hydrological model which enables detailed assessment of climate change impacts on the global water cycle and water resources.



<https://h08.nies.go.jp/h08/viewer.html>

ASEAN Scoping Workshop, 29 March 2023

3 pillars of AP-PLAT's activities



ASEAN Scoping Workshop, 29 March 2023

Adaptation Planning

A comprehensive website that provides practical information on adaptation planning process

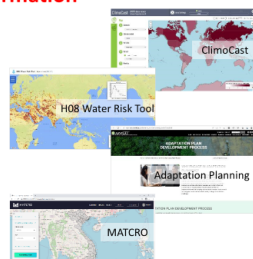


https://ap-plat.nies.go.jp/adaptation_plan/index.html

ASEAN Scoping Workshop, 29 March 2023

AP-PLAT Tools and Scientific Information

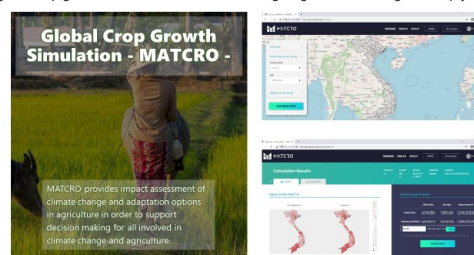
- ClimoCast
- H08 Water Risk Tool
- Adaptation Planning webpage
- MATCRO – to be published this year
- Adaptation Database – to be published this year
- ClimoKit – under maintenance
- ...



ASEAN Scoping Workshop, 29 March 2023

MATCRO

A global crop growth simulation model for simulating long-term trends in global crop yields.



ASEAN Scoping Workshop, 29 March 2023

ClimoCast

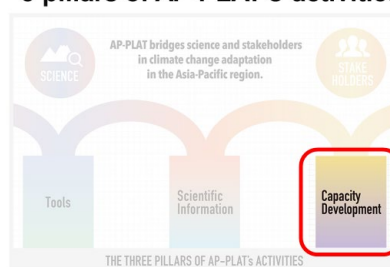
A tool that allows users to check future regional climate projections and compare major emission scenarios and climate models.



<https://e-plat.nies.go.jp/ap-plat/climo6/global.html>

ASEAN Scoping Workshop, 29 March 2023

3 pillars of AP-PLAT's activities



ASEAN Scoping Workshop, 29 March 2023

Capacity development



- Training WS in person and online
- E-learning courses
- Guidebooks
- . . .



ASEAN Scoping Workshop, 29 March 2023

Thank you for your attention

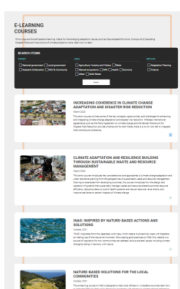
Slavka Sakata
sakata.slavka@nies.go.jp

Center for Climate Change Adaptation (CCCA),
 National Institute for Environmental Studies (NIES)



E-learning courses

- Increasing coherence in climate change adaptation and disaster risk reduction
- Climate Adaptation and resilience building through sustainable waste and resource management
- INAS: Inspired by nature-based actions and solutions
- Nature-based solutions for the local communities
- Building resilience to compound and cascading disaster risks (CCDR)
- Utilize a climate projection tool "ClimoCast" for the NAP process
- Use of the S8 Downscaler (S8DS), a climate downscaling tool to aid climate adaptation planning
- Accessing the GCF for adaptation



https://ap-plat.nies.go.jp/adaptation_literacy/resources/index.html

ASEAN Scoping Workshop, 29 March 2023

Guiding Question



How can AP-PLAT contribute to:

- the development of a **long-term** climate-resilient net-zero transition **roadmap that avoids unsustainable lock-ins**
- promoting **synergies** between adaptation and mitigation

AP-PLAT can offer:

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- **Capacity development resources** – E-learning materials, guidebooks ...
- **Network** of supporting organizations and partner organizations

AP-PLAT is in a unique position to **bring in knowhow from diverse players**.

ASEAN Scoping Workshop, 29 March 2023

Challenges

- How to encourage **long-term thinking** in cost-benefit analysis.
 (Short-term thinking leads to unsustainable lock-ins)
- How to **change the mindset** from adaptation and mitigation being **rivals**
 (competition for funds) to being **allies** (needing each other to succeed)
- How to put in place **practical incentives** to encourage adaptation/mitigation synergies.

ASEAN Scoping Workshop, 29 March 2023

4. Business/Industry (Session 3)

4.2. Japan's Power Sector Initiatives

29 March 2023 / Japan

The Scoping Meeting on the ASEAN Climate Change Strategic Action Plan 2023-2030 (ACCSAP) & a national long-term roadmap to synergize mitigation and adaptation transition

Business/Industry Session

Japan's Decarbonization Assistance for the Asian Power Sector

Climate & Energy Area / Policy Researcher
Hajime Takizawa

IGES

Japan pledges \$10 billion to support Asia's zero emission path in COP 26

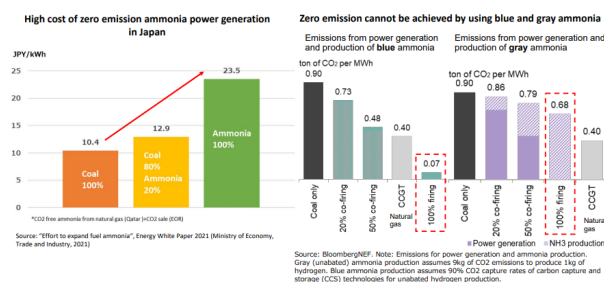
PM Kishida says:

- Converting existing thermal power into zero-emission is a necessary path
- Japan will develop leading projects to transform fossil-fuel-fired thermal power into zero-emission thermal power such as ammonia and hydrogen

Source: COP26 World Leaders Summit Statement by Prime Minister KISHIDA Fumio (Speeches and Statements <by> the Prime Minister) / Prime Minister's Office of Japan (kanto.go.jp)



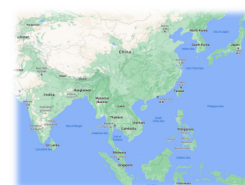
Challenges of ammonia power generation



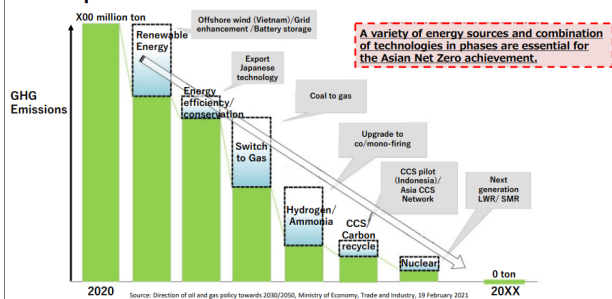
Discussion point:

What kinds of decarbonization technologies do Asian countries request Japan to provide?

1. Energy Efficiency
2. Renewable Energy
3. Switch to Natural gas and LNG
4. CCUS/Carbon Recycling
5. Hydrogen and Ammonia
6. Others



Japan's Initiative for Asian Net Zero in Power Sector



Asia Zero Emissions Community (AZEC) Ministerial Meeting (March 2023)

Partner countries: Australia, Brunei, Cambodia, Indonesia, Japan, Laos, Malaysia, Philippines, Singapore, Thailand, and Viet Nam (11)

Chair's Summary:

AZEC countries will further cooperation discussions and actions taking the following perspectives

- Energy Efficiency
- Renewable Energy
- Natural gas and LNG
- CCUS/Carbon Recycling
- Hydrogen and Ammonia
- Critical Minerals



Source: Asia Zero Emission Community (AZEC) Ministerial Meeting and AZEC Public-Private Investment Forum Held (meti.go.jp)


5. Youth (Session 4)

5.2. Breakout Group I

Expectations for the development of a long-term integrated roadmap for mitigation and adaptation beyond 2050

- Establish specific and doable programs, projects and activities to address issues and concerns on the environment and ecology.
- Network with other governments and non-government organisations.
- Inclusive
- Rely more on Bioenergy
- Youths should join more on behavioral change actions from intergenerational approach
 - Youth representative should be given a chance to speak about "The future they want"
- Increase the participation and capacity of women and girls
- Enhance the project management and entrepreneurship skills of youths in actions

Means of collaboration between youth and multi-stakeholder as a career step.

- Encourage and support Youth-led organizations.
- Example:
 

YOUTH for ENVIRONMENT in SCHOOLS Organization (YES-O) (Philippines)
- Opportunities for more SDGs subject as soon as possible in schools.
 - Introduced the 17 SDGs to schools
- Green jobs on hands-on approach at different levels: volunteer, internship, practical, professional.

Means of youth engagement to overcome barriers between mitigation and adaptation

- Creative economies
 - Inclusivity & Leadership role of the youth.
- Use social media platform to advocate climate change initiatives.
- Laymanize policies and research findings.
- Encourage community participation and initiative in environmental and ecological movements and actions, and
- Develop among members and the community proper environmental values, skills and attitudes.


Forms of international cooperation between ASEAN and Japan to address the multifaceted challenges of climate change.

- Encourage the sharing of knowledge and know-how between cooperating entities.
- Ensure support and progress in the development of coordinated efforts.
- Cooperation at university level.
- Cooperation between shared hobby of youths because they are somehow like-minded.
- Joint-projects using power of social media.

5.3. Breakout Group 2

Youth Session BoR

Moderator: Ayako Takao
(Climate Youth Japan/ International Christian University)



Climate Youth Japan
since 2010

Organization Chart

About

Climate Youth Japan (CYJ) is a youth environmental network NGO founded in the spring of 2010 by Japanese youth who participated in the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP16). Currently, we have about 40 members (number of participating members) from all over Japan. We are mainly active in online meetings and events as in-person meetings are limited.

Vision

Our vision is "to realize an equitable and sustainable society through youth-led solutions to climate change issues." With this vision, we aim to achieve the 1.5°C target and involve youth in society's decision-making process.

Activities

• COP Trainers
Since its establishment in 2010, CYJ has dispatched Japanese youth to the United Nations Climate Change Conference (COP). This dispatch aims to foster young leaders and actors to tackle climate change issues. After meeting and preparing for international negotiations and other related topics, the dispatch will seek to communicate their opinions dramatically and enthusiastically to a wider range of the future generations and to exchange and collaborate with youth from around the world.

• Signature of LDCY
We organize the Conference of Youth (COY), a youth summit of COP, held in different regions. In FY2021, we held the Youth COP Trainers Meeting from October 20 to 26.

• Policy Proposal Activities
We have participated in various exchange meetings, public-private round table conferences, and public comments held by the Ministry of Economy, Trade, and Industry (METI), Ministry of the Environment (MEXT), Ministry of Agriculture, Forestry and Fisheries (MAFF), Liberal Democratic Party of Japan (LDP), etc. We are now active in these proposals and comments on our website.

• Study Group
We have created several study groups to discuss and update our knowledge from members interested in a common theme. We plan to do so for as long as possible to produce more meaningful impact in a group.

More Information
Website: climateyouthjapan.org
LINE: @climateyouthjapan
Instagram: @climateyouthjapan
Facebook, Twitter, etc.

① Expectations for the development of a long-term integrated roadmap for mitigation and adaptation beyond 2050

- The development take into consideration the existing national-level LTS/NZE, etc.
- Conduct advisory group engagement from many perspectives (technology (ASEAN COSTI), RnD, gender, youth, academican, etc)
- Assess the respective milestones and finance both of mitigation and adaptation
- Barriers may include lack of countable measures and different indicators for mitigation and adaptation
- Monitoring systems for policy advocacy done by youth
- Universities may be engaged as solutions
 - eg: monitoring system with academic institutes

② Means of youth engagement to overcome barriers between mitigation and adaptation

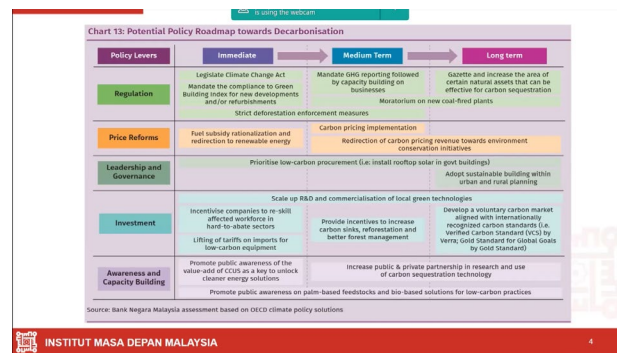
- Supporting the sustainability of youth-led initiatives
- Youth limitation on expanding their initiatives, so most times, mitigation and adaptation initiatives separated
- Providing platform for youth advisory groups for this development is crucial to understand the key issues, which most likely, is the supporting infrastructure to execute→visible youth contribution policy making process
- CC education for awareness with public support
 - cases: waste management in ASEAN countries

③ Forms of international cooperation between ASEAN and Japan to address the multifaceted challenges of climate change.

- Acknowledge the JAIF support to ASEAN which then perhaps can be extend not only financial support but also RnD and technology transfer.
- Workshops for youth on climate change mitigation and adaptation especially in more vulnerable ASEAN countries

④ Means of collaboration between youth and multi-stakeholder as a career step.

- Providing knowledge sharing platform through mentor-mentee activities among youths and stakeholders
- Professionals/experts could have sharing session via youth-led ASEAN-level organizations → the issue during this era is that the transition to environmental friendly job markets provides different composition and skillset compared to years ago
- Youth internships (paid) in different environment-related government agencies/NGOs to provide exposures, learnings, and support
- Capacity building-developing skill, knowledge, networking and institution is necessary to address the climate change
- Awareness on the net-zero pathway-Increase the awareness that includes youth, stakeholders, relevant ministries and authorities to participate in the course.
- Sustainable green financing - Channel private capitals towards the transition to a low-carbon and climate resilient economy (eg. green bonds, climate funds and carbon pricing)
- Synergies between climate and development action - Expansion of the renewable energy such as solar and wind power and sustainable agriculture to enhance the resilience of the rural communities to the impacts of climate change
- Think how to contribute to the CC



3.0 QUESTION

What are expectations and desires for the national long-term sustainable transition toward a resilient net-zero country in ASEAN region?

FINANCE AND INNOVATION
Malaysia leading as global leader in introducing the Green Sukuk or Islamic ESG model. Green finance, such as ESG, can drive the required sustainable finance transformation by mobilising capital, encouraging sustainable investments, lowering financial risks, and fostering innovation.

YOUTH-LED CLIMATE MOVEMENT AT LOCAL LEVEL
Joining or starting a local climate action group, participating in protests or demonstrations, advocating for climate-friendly policies with local officials, and volunteering for environmental organizations is a powerful force for change.
Malaysia has several youth-led organisations focused on climate action and environmental sustainability, including the Malaysian Youth Delegation (MYD) and Klima Action Malaysia (KAMY).

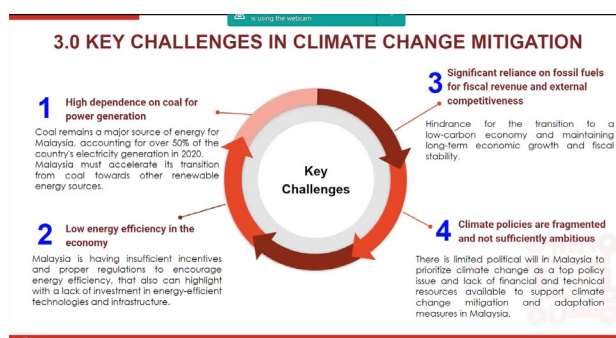
KNOWLEDGE SHARING ACROSS SECTORS
Spreading the knowledge across sectors and all levels can lead to the development of new and innovative climate solutions.

5.4. Breakout Group 3

2.0 CURRENT SCENARIOS - MALAYSIA

0.80%	#49	#62	45%
Share of global GHG emissions	Climate Vulnerability Index ranking	Human Development Index ranking	Unconditional emissions reduction target by 2030

- In 2021, Malaysia increased its mitigation ambition (Nationally Determined Contribution, NDC) with an unconditional target to cut carbon intensity against GDP by 45% by 2030 compared to 2005 levels.
- However, government perceives climate change-related vulnerabilities as generally low compared with other countries in the region. As a result, the government has subordinated adaptation action to the pursuit of economic development.
- Like other countries with less exposure to disasters, Malaysia tended to be complacent about adaptation, such that policies and programs in place are disjointed, weak or limited in impact.
- A National Adaptation Plan (NAP) and NDC Roadmap will be developed to help achieve NDC targets.
- Usable science and data to inform decision-makers = the importance of science communication to increase awareness among the public and policymakers.
- Bank Negara Malaysia (BNM) is promoting greener financing by fully transitioning to a green economy to navigate the decarbonisation of Malaysia's economy as one way to synergise the net-zero pathway.



6. Discussion (Session 5)

6.2. Case of Solar PV and Forest

The Scoping Workshop on the ASEAN Climate Change Strategic Action Plan 2025-2030 (ACCSAP)

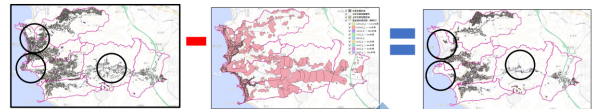
The methodology for mitigation and adaptation synergy

Tentative results of the case study on PV and Forest

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(JAPAN) Hayama Town Case Study 1: Results of Solar Installation Potential Analysis

Theoretical introduction amount > Technology introduction amount > Project-based introduction amount (disaster risk) > **Exclusion of buildings in designated disaster areas and risk areas**

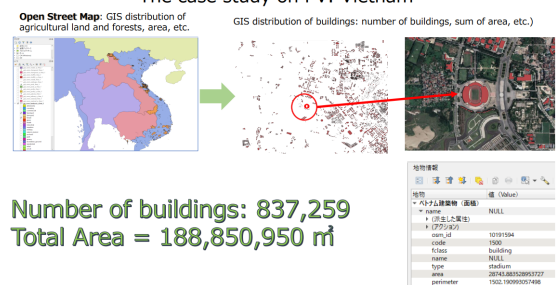


- In the future, medium- and long-term climate change impacts should also be considered
- Medium- to long-term climate change impact: projected sea level rise by 2050 and 2100, projected temperature, projected rainfall, etc.
- Economic analysis (cost), industrial impact analysis, etc. can be done as next step

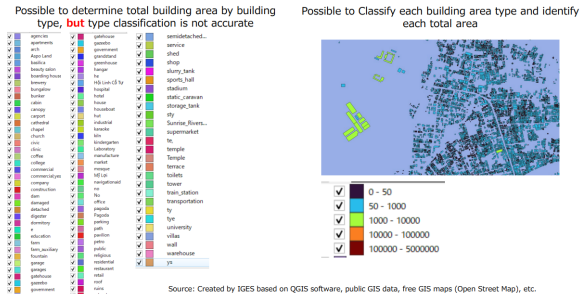
$$(1-35\%) \times 91,000 \text{ KW} = 59,000 \text{ KW}$$

Source: Created by IGES based on QGIS software, public GIS data, free GIS maps (Open Street Map), etc.

Progress of Renewable Energy Potential Assessment The case study on PV: Vietnam

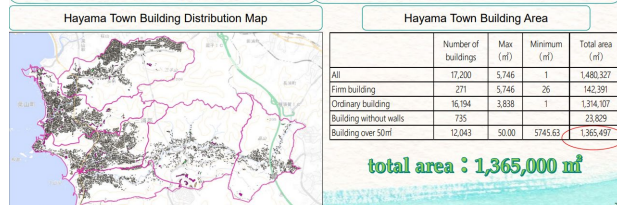


Progress of Renewable Energy Potential Assessment



(JAPAN) Hayama Town Case Study 1: Results of Solar Installation Potential Analysis

- Hayama Town (17.3 km²): 32,000 Population, 12,000 Households, 17,200 buildings
- Field of application: Analysis of rooftop PV installation potential. More precise potential maps can be created by inputting information on buildings owned by local governments; vacant houses, household composition, income, energy consumption, etc.
- Materials: GIS data of building perimeters, municipal polygons
- Challenge: Municipal data input is needed for further utilization analysis



(JAPAN) Hayama Town Case Study 1: Results of Solar Installation Potential Analysis

- Factors to be considered when estimating PV installed area: Theoretical introduction area > Technological introduction area > Project-based introduction area

$$1,365,000 \text{ m}^2 \div 1 \text{ KW} / 15 \text{ m}^2 = 91 \text{ MW}$$



- Theoretical introduction factor > Technological introduction
- Rooftop shape: The roof shape of each building varies and can be classified into four types.
 - Roof orientation (relative to the sun): The amount of sunlight differs depending on the shape and orientation.
 - Building surroundings: shading by buildings, mountains, trees, etc.
 - Structure of the building: Wooden, reinforced concrete, other
 - Age of building: Disaster prevention considerations
 - Landscape: Light pollution and other neighborhood problems

(JAPAN) Hayama Town Case Study 2: Tentative Result of Drone survey of forest biomass volume

- Obtain approval from the forest owner company and Hayama Town by the end of November 2022
- Conduct drone survey from December 2022 to January 2023
- LiDAR survey: 3D data (mountain topography, structural modeling)





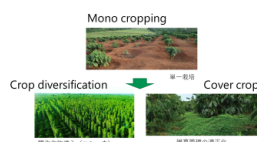
study in coffee sector in Vietnam for sustainable
adaptation and mitigation

transition promoting adaptation and mitigation synergy

- Vietnam is the world's second largest

- Private sector-led initiatives for sustainable coffee production have been promoted in response to the sustainable sourcing policy of importing companies
 - Companies support farmers to follow the voluntary sustainability standard and obtain certifications such as Rainforest Alliance, 4C etc.
- A program with a landscape approach is being implemented to make the entire Dak Lak province a sustainable coffee production area.
 - Multi-stakeholder governance is applied including the government, importer companies, local exporting companies and farmers

- Climate model analysis predicts
 - increasing temperature and decreasing precipitation
 - reducing suitable areas for producing coffee
- Conventional practices
 - Overuse of fertilizer and irrigation water
 - Mono-cropping
- The current landscape program aims for MORE sustainable farming practice but lack of alignment to the national mitigation policy and weak consideration of adaptation and resilience
 - Reduction of using chemical fertilizer without decreasing productivity (GHG emission reduction)
 - Adequate irrigation (water conservation)
 - Diversification of farms or agro-forestry (increasing C stock, income diversification)
 - Training of farmers and organizing farmer groups



Research methodology

- To analyze whether the practices introduced by the current program contributes to strengthen adaptive capacity (local resilience)
- To identify adaptation options in coffee production for future long-term climate change scenarios (ex. 1.5° C and 3° C) by discussing with researchers, government and experts in private sector.
- To identify the adaptation option that maximizes mitigation benefits by calculating with emission factors
- To propose necessary mechanism to engage local farmers to the sustainable transition pathways
 - Collect local farmers perspectives
 - Challenges in implementing the identified adaptation option which maximizes mitigation benefits
 - Considering the most vulnerable farmers including poor and ethnic minorities

Guiding questions of this session

- *What do you think key areas and/or approaches to generate stronger synergy between mitigation and adaptation measures?*
 - The agricultural sector is an area where synergies between mitigation and adaptation can be achieved.
 - The situation varies from country to country and crop to crop, so I think it is important to analyze synergies and trade-offs carefully.
- *What challenges and/or opportunities are there at the national and regional (ASEAN) level to promote a transition toward a resilient net-zero country in ASEAN region?*
 - There are many small producers involved in the agricultural sector
 - top-down approaches are not enough to bring about the transition to sustainable agriculture
 - how to engage them? how to strengthen the local resilience?

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