

Sustainable
Asia LCS



藤野 純一

Junichi FUJINO

fujino@iges.or.jp

Introduction of Long-Term Strategy (LTS) planning using AIM (Asia-Pacific Integrated Model) simulation model

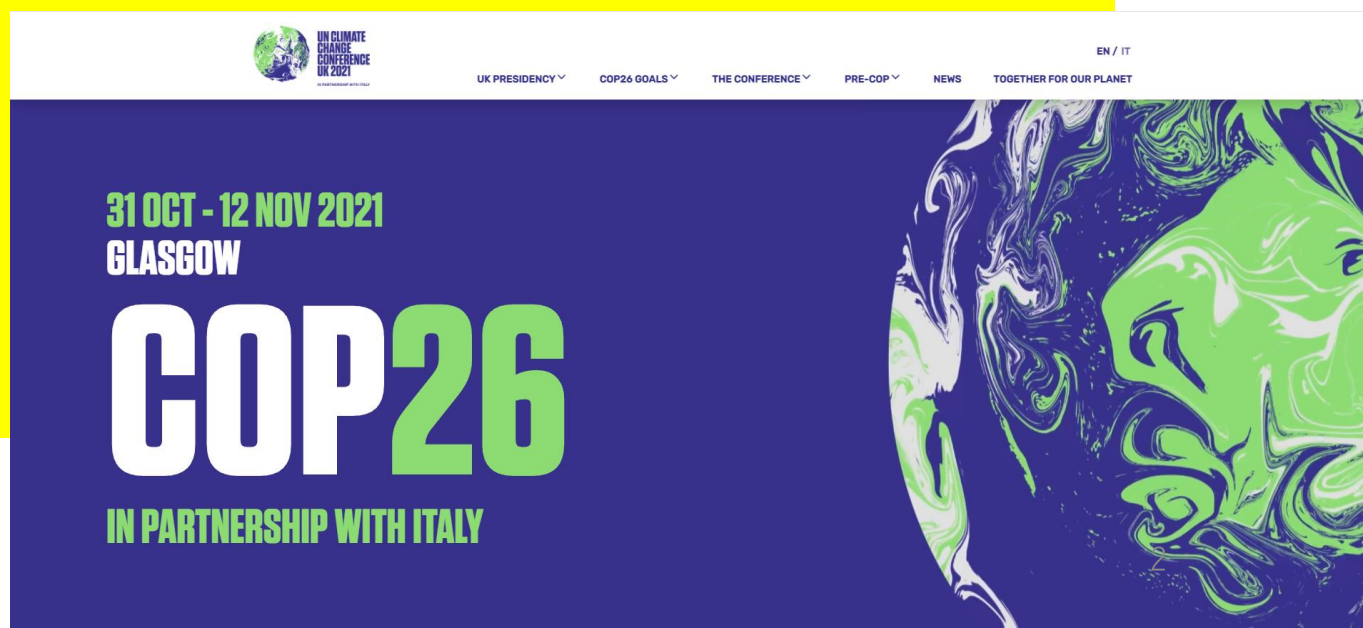
Junichi Fujino (IGES)

The Philippines-Japan Environmental Week
March 3, 2022

Main agenda at COP26

1. Secure global net zero by mid-century and keep 1.5 degrees within reach
2. Adapt to protect communities and natural habitats
3. Mobilise finance
4. Work together to deliver

<https://ukcop26.org/cop26-goals/>



ASEAN's Emerging Mission for a Low Carbon Energy Transition

By Jannata (Egi) Giwangkara & Michael Dolan

This year's United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP) was arguably important in signalling Southeast Asia's growing climate ambition. By the end of COP26, eight out of ten ASEAN Member States (AMS) had pledged to net zero emissions, with Vietnam and Thailand announcing their aspirations at the conference following announcements by Lao PDR, Indonesia and Malaysia on the road to COP26. Meanwhile, Brunei Darussalam, Myanmar, and Singapore were among the first movers to announce net zero targets as early as last year.

Vietnam pledges net zero emissions by 2050 at COP26

Minh Vu

Vietnam focuses on mitigation and adaptation in implementing the Paris Agreement through bilateral and multilateral cooperation and new mechanisms.

Vietnam targets 2050 for net-zero emissions as Prime Minister Pham Minh Chinh delivered a speech at the 2021 United Nations Climate Change Conference (COP26) held in Glasgow, the UK on Oct 1.



Vietnam's Prime Minister Pham Minh Chinh at COP26. Photo: VNA

Thailand vows to reach net zero carbon emissions by 2065 at COP26

Nov 2, 2021

Thailand's Prime Minister Prayut Chan-o-cha on Monday expressed willingness reach **carbon neutrality in 2050 and net zero emissions by 2065** at the World Leaders Summit of COP26, Nov 2021.

He said, with the adequate, timely and equitable support, through technology transfer and cooperation and, most importantly, the availability of and access to ample green financing facilities, **Thailand can increase our Nationally determined contributions (NDC) to 40% and reach carbon neutrality in 2050.**





JAPAN
PAVILION

COP26

2021.11.11 THU

15:00 - 16:30

2021.11.11

Zero Carbon Partnerships between Japan and Asia for a New Age – Using the Asia-Pacific Integrated Model (AIM) to pave the way for carbon neutrality –

Institute for Global Environmental Strategies (IGES)

Co-organizer

Ministry of the Environment, Japan (MOEJ), National Institute for Environmental Studies (NIES)

<http://copjapan.env.go.jp/cop/cop26/en/exhibition/details/organization-institute-02/>



<Part II>

15:40-15:45	Framing presentation / Introduction Dr. FUJINO Junichi (Programme Director, Integrated Sustainability Centre, IGES)
15:45-15:55	AIM's contribution to Asia Dr. MASUI Toshihiko (Head, Social Systems Division (Decarbonization Measures Assessment Section), NIES, Japan)
15:55-16:05	AIM's contribution to Thailand LTS Prof. Bundit Limmeechokchai (Sirindhorn International Institute of Technology, Thammasat University (SIIT-TU), Thailand)
16:05-16:15	AIM's contribution to Indonesia LTS Prof. Rizaldi Boer (Bogor Agricultural University (IPB), Indonesia) Prof. Retno Gumilang Dewi and Dr. Ucok WR. Siagian (Bandung Institute of Technology (ITB), Indonesia)
16:15-16:25	AIM's contribution to low-carbon cities in Malaysia YBhg. Datuk Seri TPr. Hj. Mahadi Bin Che Ngah (Mayor of Kuala Lumpur City Hall, Malaysia) Prof. Chin Siong Ho (University of Technology Malaysia (UTM), Malaysia)

Partnerships between Japan and the rest of Asia for a new age – Using the Asia-Pacific Integrated Model (AIM) to pave the way for carbon neutrality in the region

Long-term strategy in THAILAND and AIM Model

11-11-2021

Bundit Limmeechokchai

THAMMASAT UNIVERSITY

Presentation by
Prof. Bundit Lim

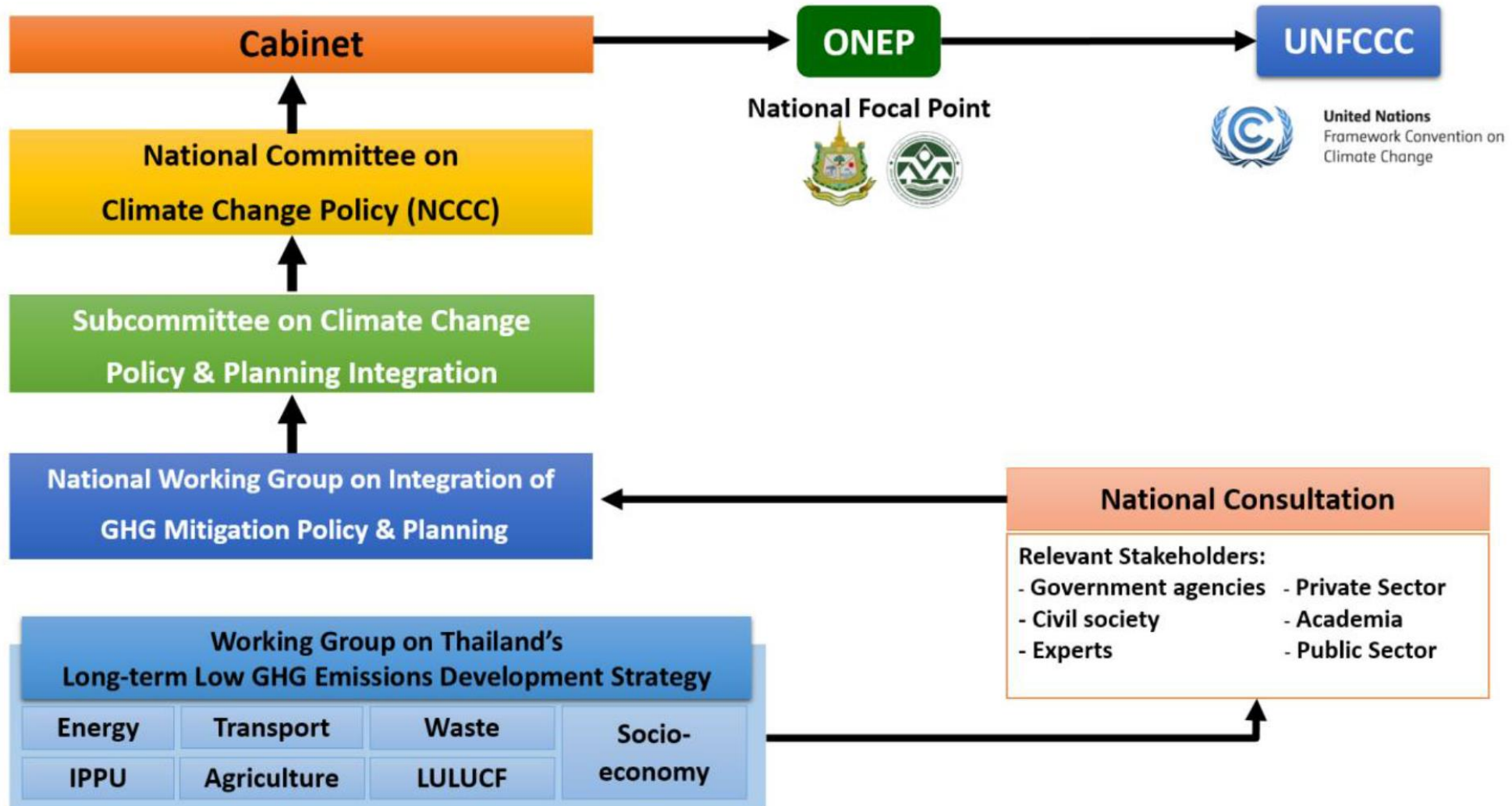


Figure 3-1: Preparation and approval process of Thailand's LEDS

Source: UNFCCC (2021) https://unfccc.int/sites/default/files/resource/Thailand_LTS1.pdf

Presentation by
Prof. Bundit Lim

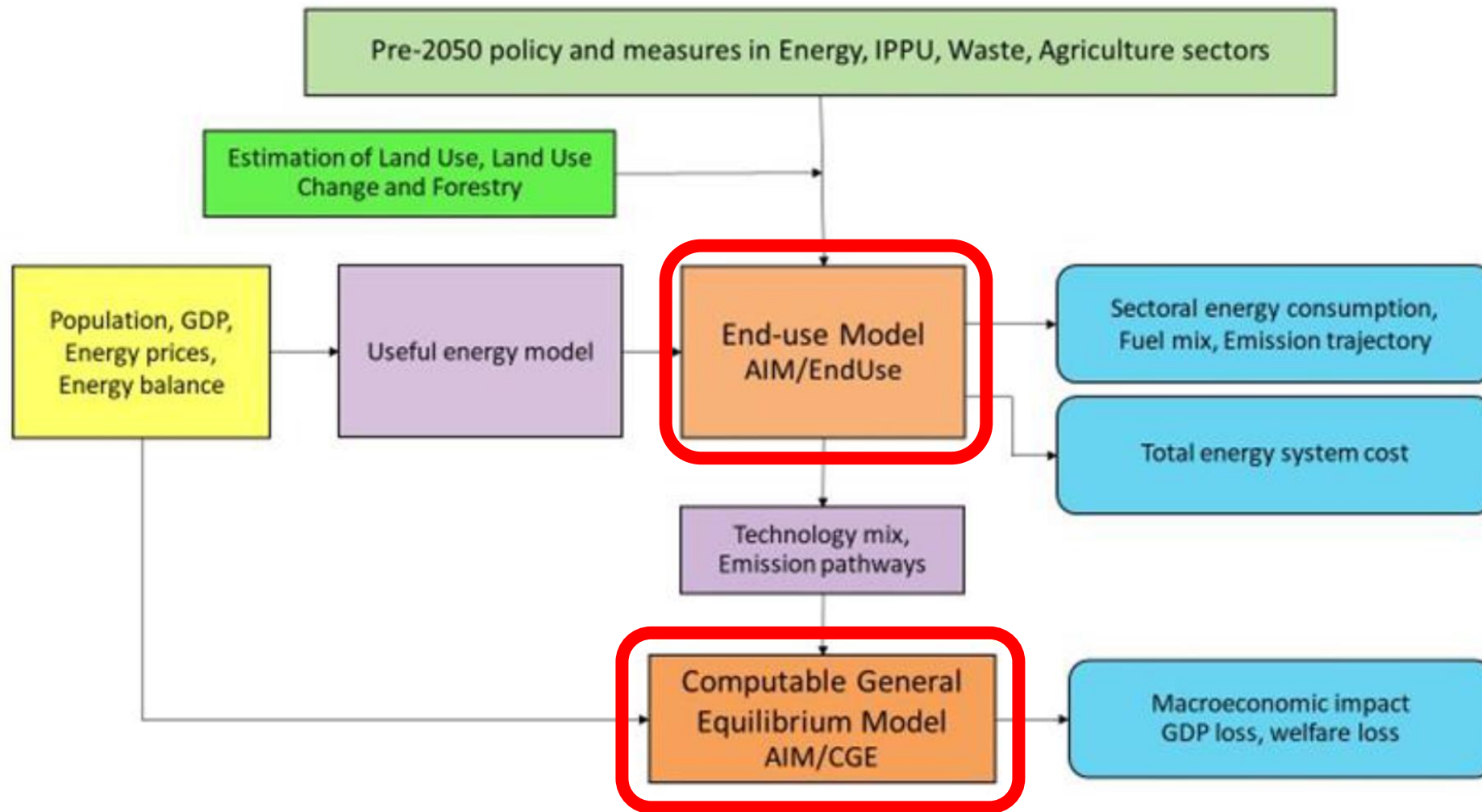


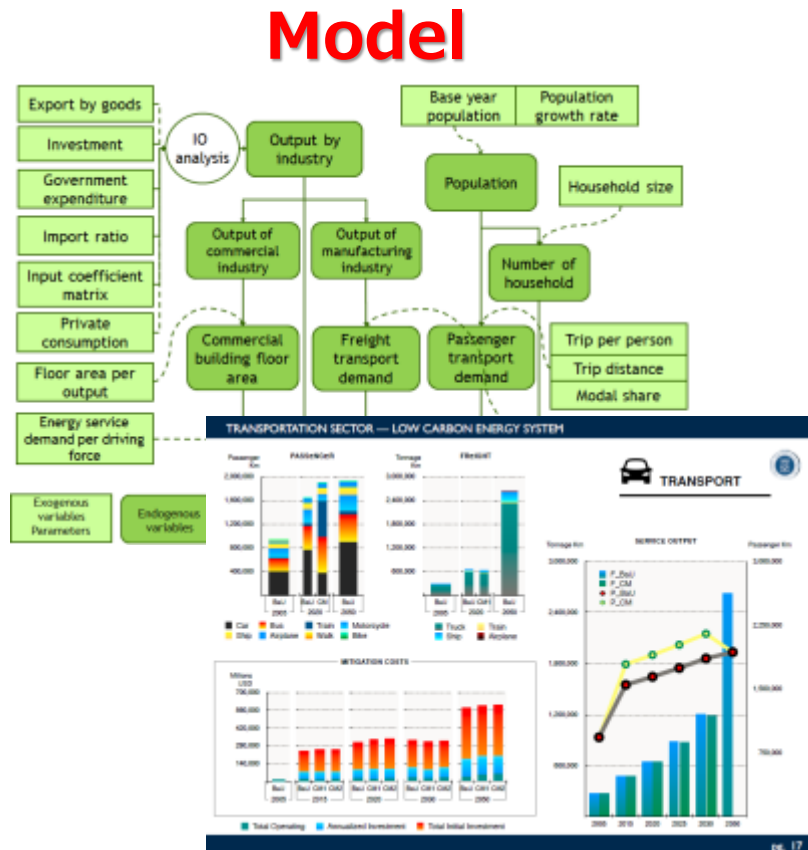
Figure 3-2: Framework of Thailand's LEDES Development

Source: UNFCCC (2021) https://unfccc.int/sites/default/files/resource/Thailand_LTS1.pdf

Presentation by
Prof. Bundit Lim

What is AIM? – start project since 1989 -

- **Asia-Pacific Integrated Model (AIM)** is a family of analytical models which are developed by research institutes in Japan. AIM contributes IPCC reports, discussion on climate change mitigation actions in Japan and Asian countries.
- AIM can be regarded as “**researchers network**”, because AIM is developed and applied through collaboration with researchers in various countries.



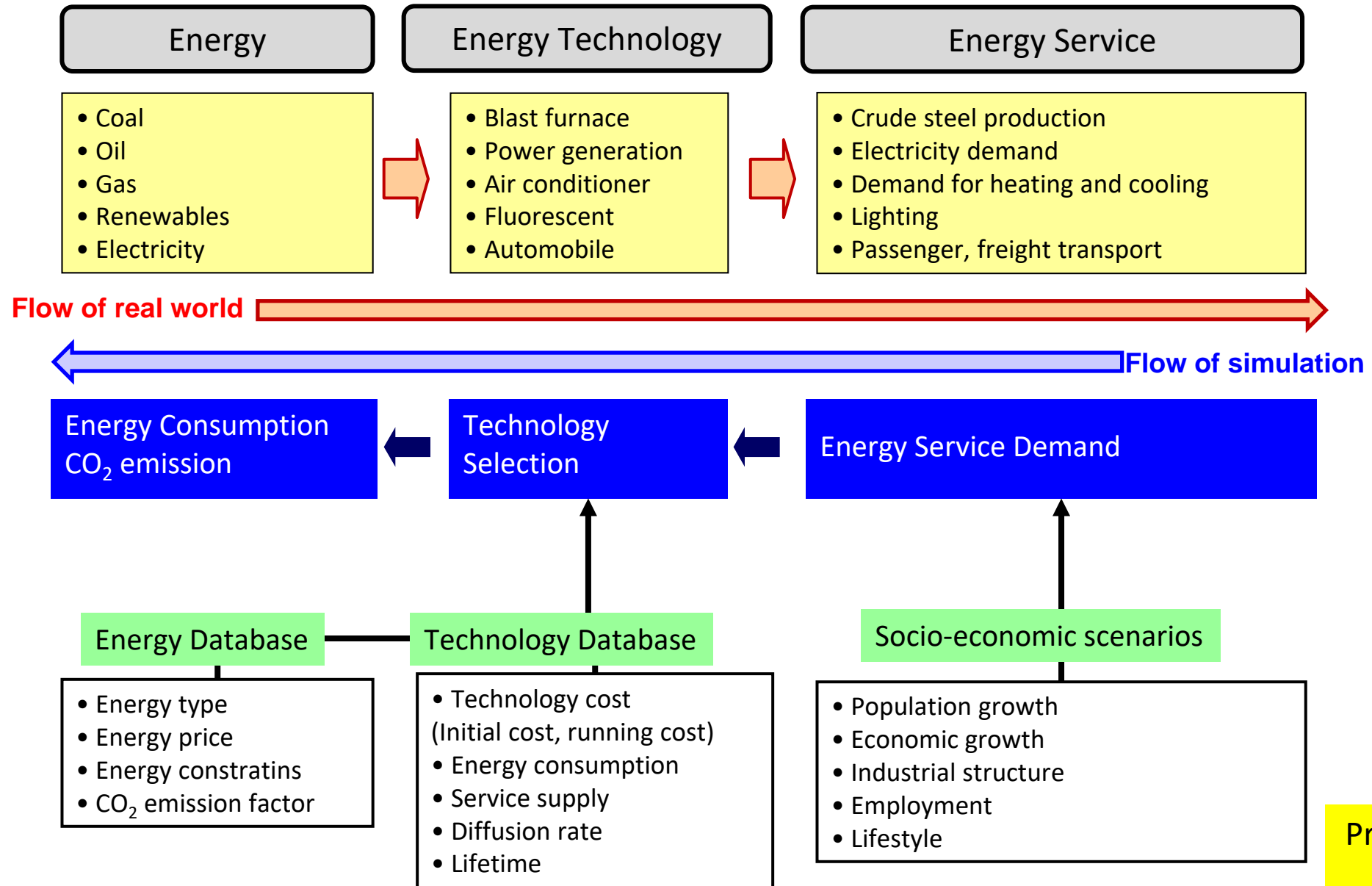
Example of AIM's structure and output

Researchers Network



27th AIM International Workshop (Sep 2021)

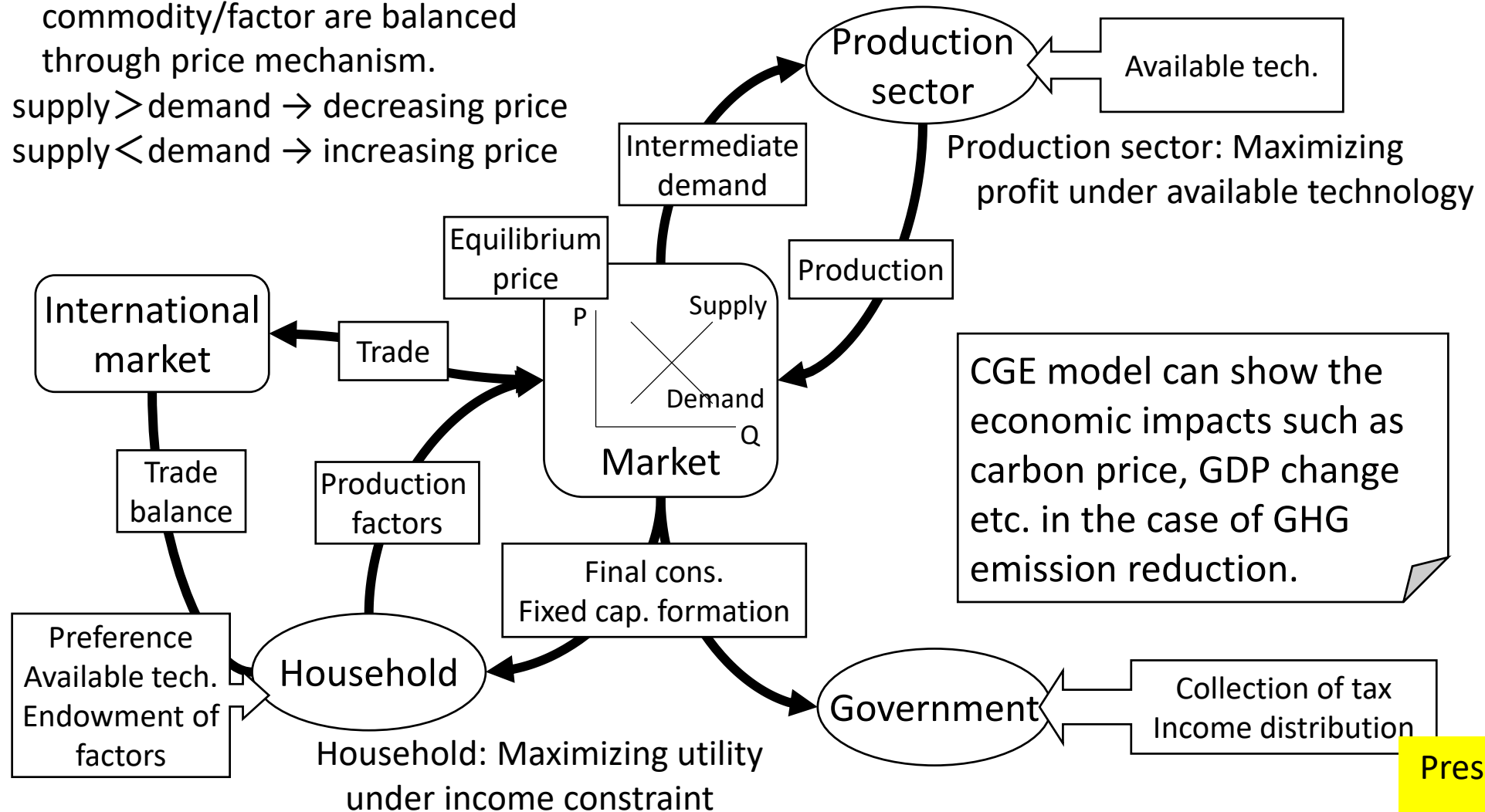
Overview of AIM/Enduse model



Presentation by
Dr. Masui

Concept of AIM/CGE (Computable General Equilibrium)

Market: supply and demand of every commodity/factor are balanced through price mechanism.
 $\text{supply} > \text{demand} \rightarrow \text{decreasing price}$
 $\text{supply} < \text{demand} \rightarrow \text{increasing price}$



Presentation by
Dr. Masui

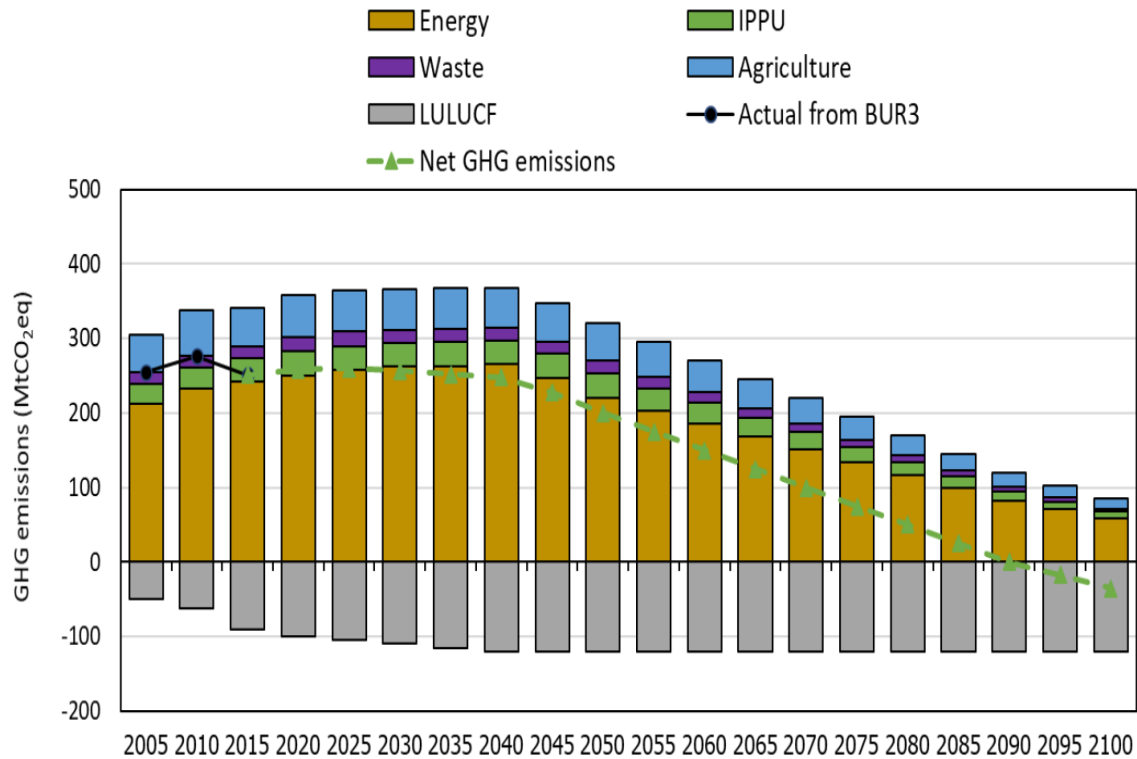


Figure 3-6: Thailand's long-term low greenhouse gas emission scenario

Thailand net-zero GHG emissions

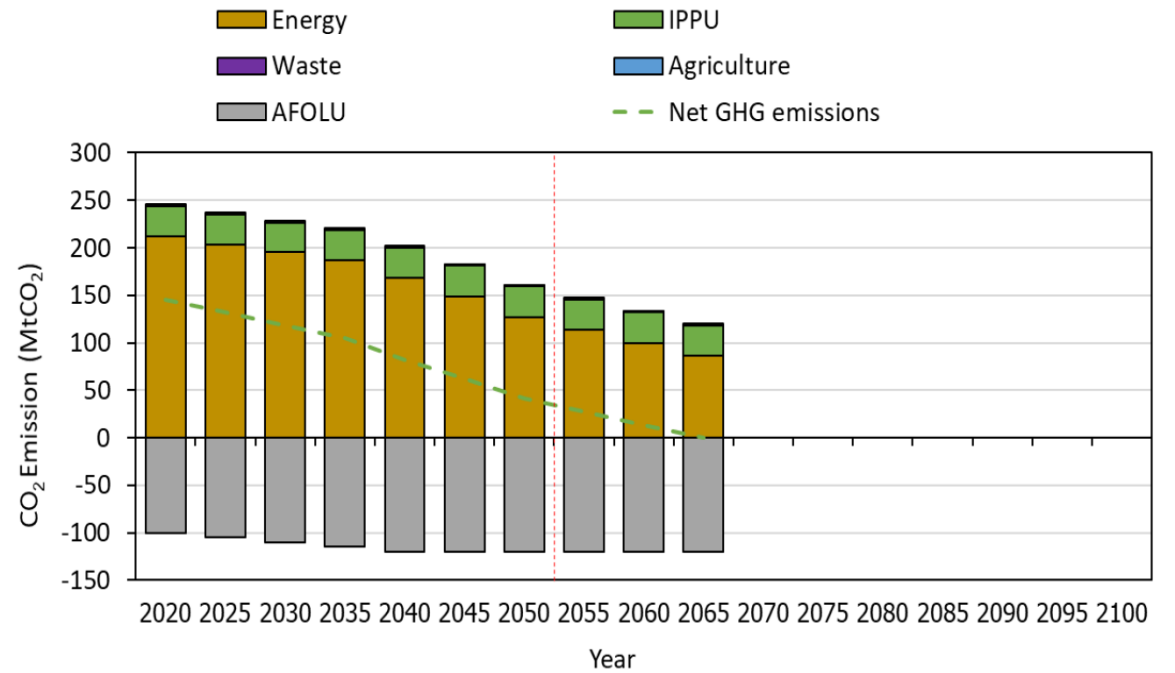


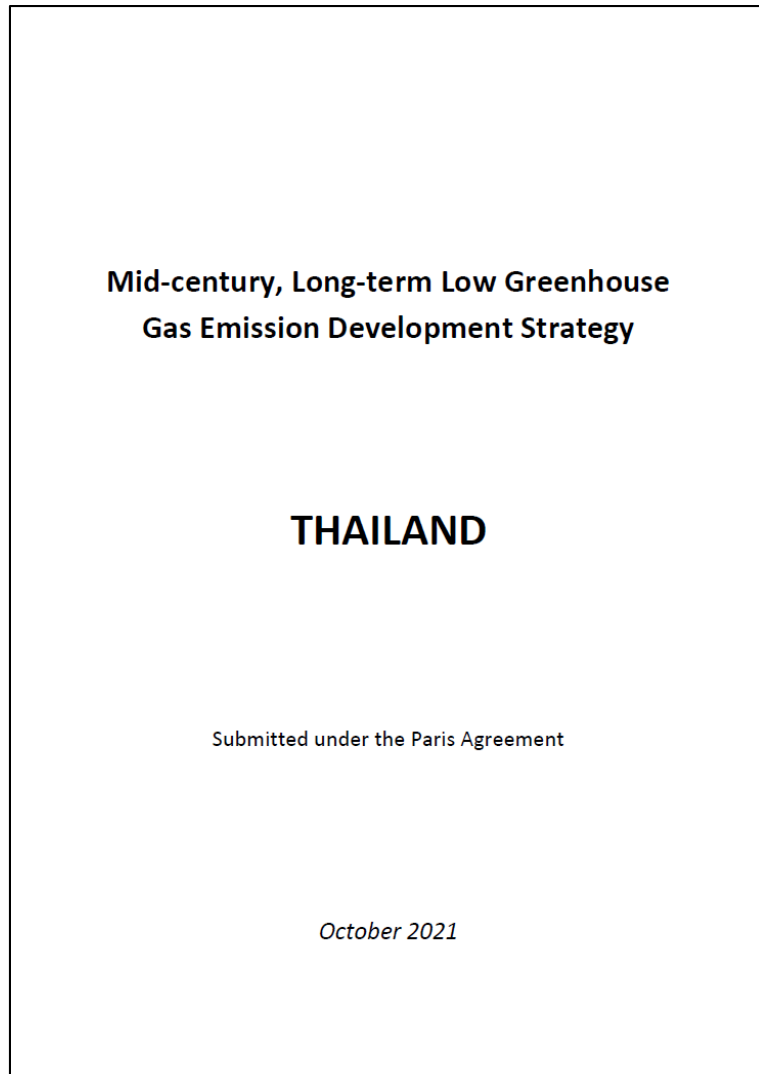
Figure 3-8: Thailand carbon neutrality by 2065 scenario

Thailand Carbon Neutrality 2065

Thailand

Mid-century, Long-term Low Greenhouse Gas Emission Development Strategy

Prof. Bundit Limmeechokchai
(Sirindhorn International Institute of Technology, Thammasat University)



3.1 Methodology for the Development of Long-term Low Greenhouse Gas Emission Pathways

3.1.1 Model for Low Greenhouse Gas Emission Pathways

Thailand's mid-century, long-term low greenhouse gas emission development strategy was developed based on the scenario of net-zero greenhouse gas emissions in the second half of this century, in line with science and the Paris Agreement. The BAU scenario was developed using input information of the current country's circumstances and status provided by related ministerial agencies into the Asia-Pacific Integrated Assessment Model (AIM) (Figure 3-2).

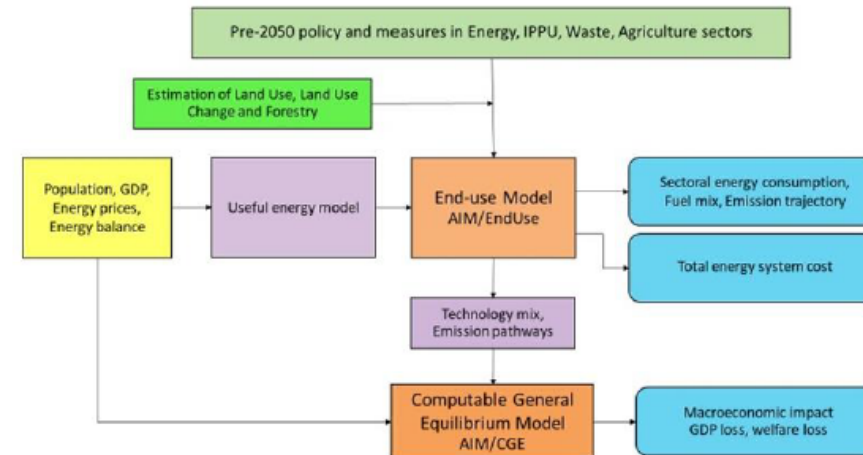


Figure 3-2: Framework of Thailand's LEDS Development

https://unfccc.int/sites/default/files/resource/Thailand_LTS1.pdf

Presentation by
Dr. Masui

Thailand

Third National Communication



<https://unfccc.int/documents/181765>

CHAPTER 3: MITIGATION MEASURES

3.2.1 NAMAs roadmap

Thailand's NAMAs aims at voluntarily reducing greenhouse gas emissions in the energy and transportation sectors by 7% by 2020 from the Business as Usual (BAU) levels. With sufficient international support, Thailand's NAMAs aims to lower the carbon trajectory up to 20% below the BAU level by 2020. The key mitigation actions committed and implemented in the Thailand's NAMA roadmap include:

- Development of renewable energy and alternative energy sources;
- Energy efficiency improvements in power generation, industries, buildings, and transportation;
- Substitution of bio-fuels for fossil fuels in the transport sector; and
- Thailand's Transport Infrastructure Development Plan.

3.2.2 Thailand's NDC

Thailand submitted its INDC and relevant information to the UNFCCC in 2015 to restate that GHG emissions can be reduced by 20% from the BAU levels by 2030, and up to 25% if the required support is received from international organizations. In addition to this progress, the NCCC established the Subcommittee on Climate Change Policy and Planning Integration, which is tasked with preparing and proposing mitigation mechanisms and measures that encompass the legal, economic, fiscal and social instruments that are required to translate the measures into the policies, strategies, and work plans to meet the medium-term and long-term mitigation targets. Since the submission of its first Biennial Update Report and ratification of the Paris Agreement in 2015, several climate change mitigation policies and measures have been put in place at the national level to fulfill Thailand's drive toward a low carbon and resilient society. In 2017, Thailand launched its NDC Roadmap to reduce 115.6 MtCO₂e, which will account for a 20.8% reduction by 2030 when compared to the BAU level.

As mentioned, both Thailand's NAMAs and Thailand's NDC were developed on the basis of BAU (Figure 3-1). The BAU scenario was created by using the Asia-Pacific Integrated Assessment Model (AIM). The AIM model was developed in collaboration between the National Institute for Environmental Studies (NIES) Japan, Kyoto University, the Mizuho Information & Research Institute, and other Asian researchers including Thailand. The AIM model focuses on relevant policies to support low-carbon pathways.

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Presentation by
Dr. Masui



COP26

Thailand

- **NDC 2030 will be 40%**
- **Carbon neutral 2050**
- **Climate neutral 2065**

Presentation by
Prof. Bundit Lim

<Part II>

- 15:40-15:45 **Framing presentation / Introduction**
Dr. FUJINO Junichi (Programme Director, Integrated Sustainability Centre, IGES)
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-
- 16:15-16:25 **AIM's contribution to low-carbon cities in Malaysia**
YBhg. Datuk Seri TPr. Hj. Mahadi Bin Che Ngah (Mayor of Kuala Lumpur City Hall, Malaysia)
Prof. Chin Siong Ho (University of Technology Malaysia (UTM), Malaysia)

COP26 Japan Pavilion Side Event **Nov 11, 2021** at 1500–
1630

Partnerships between Japan and the rest of Asia for a new age – Using the Asia-Pacific Integrated Model (AIM) to pave the way for carbon neutrality in the region

AIM's modeling contribution to low-carbon cities in Malaysia

HO CHIN SIONG (Prof) and Chau Loon Wai
UTM- Low Carbon Asia
University Technology Malaysia



Presentation by
Prof. Ho Chin Siong

Iskandar Malaysia LCS 2025 Background



FLAGSHIP A

- JOHOR BAHRU CITY CENTRE**
- Central Business District (CBD) as heritage and cultural city
 - Customs, Immigration and Quarantine Complex (CIQ)
 - Johor – Singapore Causeway

FLAGSHIP B

- NUSAJAYA**
- Kota Iskandar
 - EduCity
 - Medical Park
 - International Destination Resort
 - Southern Industrial & Logistics Clusters (SILC)
 - Puteri Harbour

FLAGSHIP C

- WESTERN GATE DEVELOPMENT**
- Port of Tanjung Pelepas (PTP)
 - Tanjung Bin Power Plant
 - 2nd Link Access to Singapore
 - RAMSAR World Heritage Park
 - Tanjung Piai – Southernmost Tip of Mainland Asia
 - Maritime Centre

FLAGSHIP D

- EASTERN GATE DEVELOPMENT**
- Tanjung Langsat Industrial Complex
 - Johor Port
 - Tanjung Langsat Port
 - Pasir Gudang Industrial Park

FLAGSHIP E

- SENAI-SKUDAI**
- Senai Airport City
 - Senai High-Tech Park
 - Sedenak Industrial Park
 - MSC Cyberport City
 - Johor Technology Park
 - University Technology Malaysia (UTM)



Presentation by
Prof. Ho Chin Siong

IM LCS Actions – Potential CO₂ Reduction

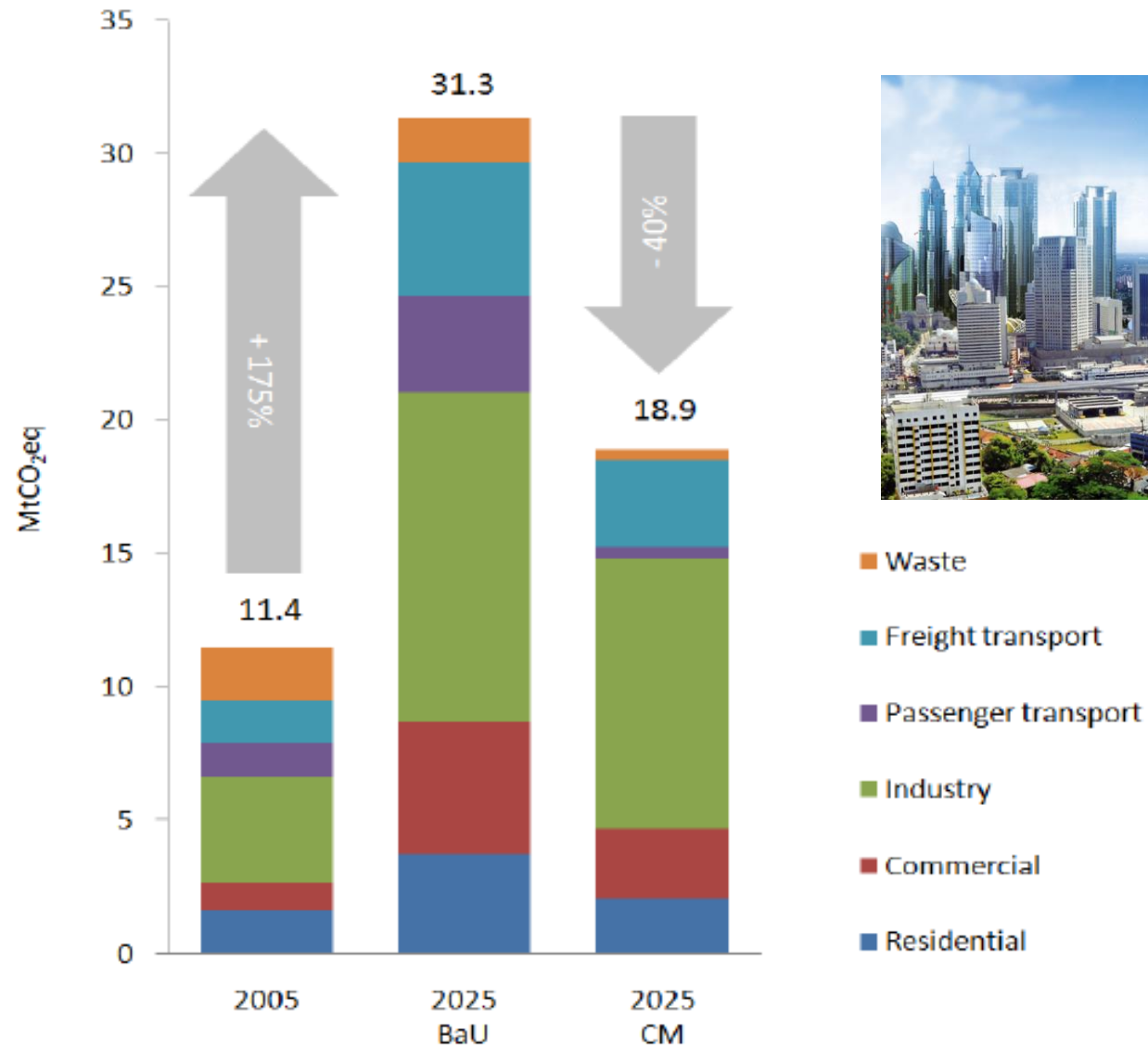


Table 1: Projected main socio-economic variables

	2005	2025	2025 /2005
Population (1000)	1,353	3,000	2.22
Household (1000)	303	706	2.33
GDP (Bill. RM)	35.7	141.4	3.96
Gross output (Bill. RM)	121.4	438.9	3.61
Primary industry	1.5	2.4	1.59
Secondary industry	86.2	274.0	3.18
Tertiary industry	33.7	162.5	4.82
Passenger transport demand (Mill. passenger-km)	9,565	59,524	6.22
Freight transport demand (Mill. ton-km)	8,269	26,054	3.15

Figure 1: GHG emissions by sectors

Presentation by
Prof. Ho Chin Siong

Buy in global – Promote IM as Green region investment hub

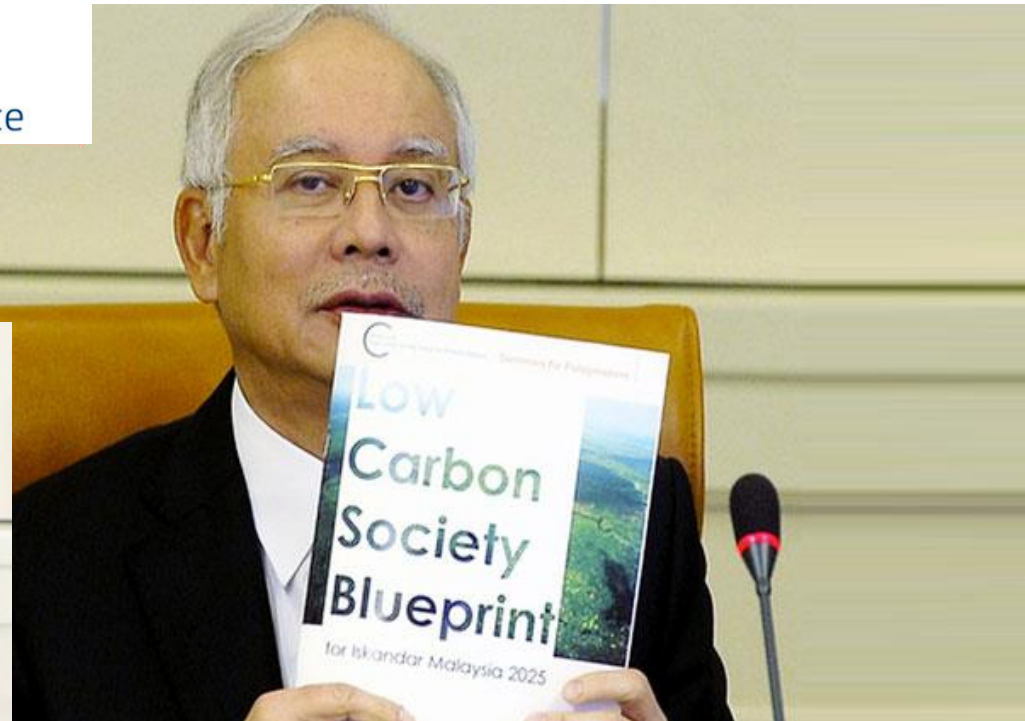
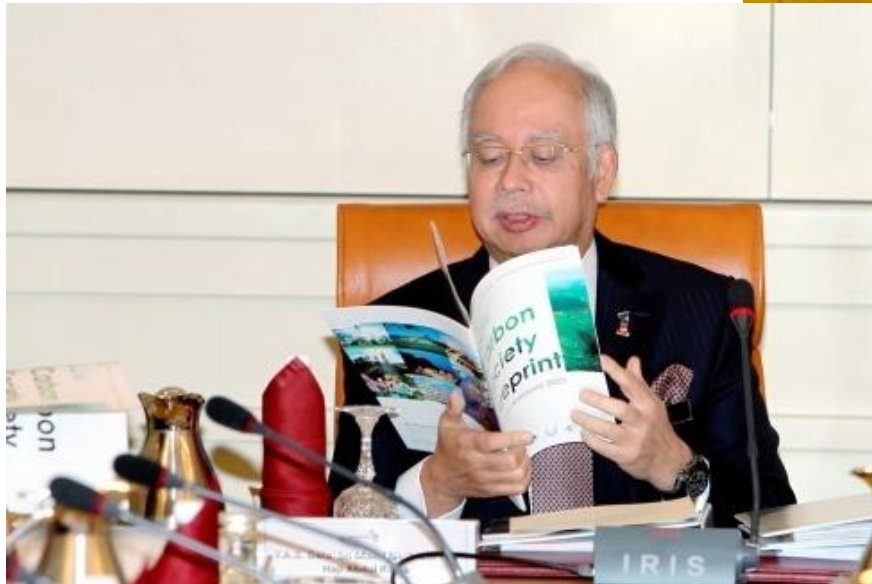
Iskandar Malaysia LCS Blueprint 2025



DOHA 2012
UN CLIMATE CHANGE CONFERENCE
COP18|CMP8

United Nations Climate Change Conference

Officially launched @ COP 18,
Doha, Qatar on 30 Nov. 2012



Launching officially endorsed by
the R.H. Prime Minister of Malaysia
on 11 Dec. 2012

Presentation by
Prof. Ho Chin Siong

From Low Carbon Society 2030 KL to Carbon Neutral Society 2050 KL

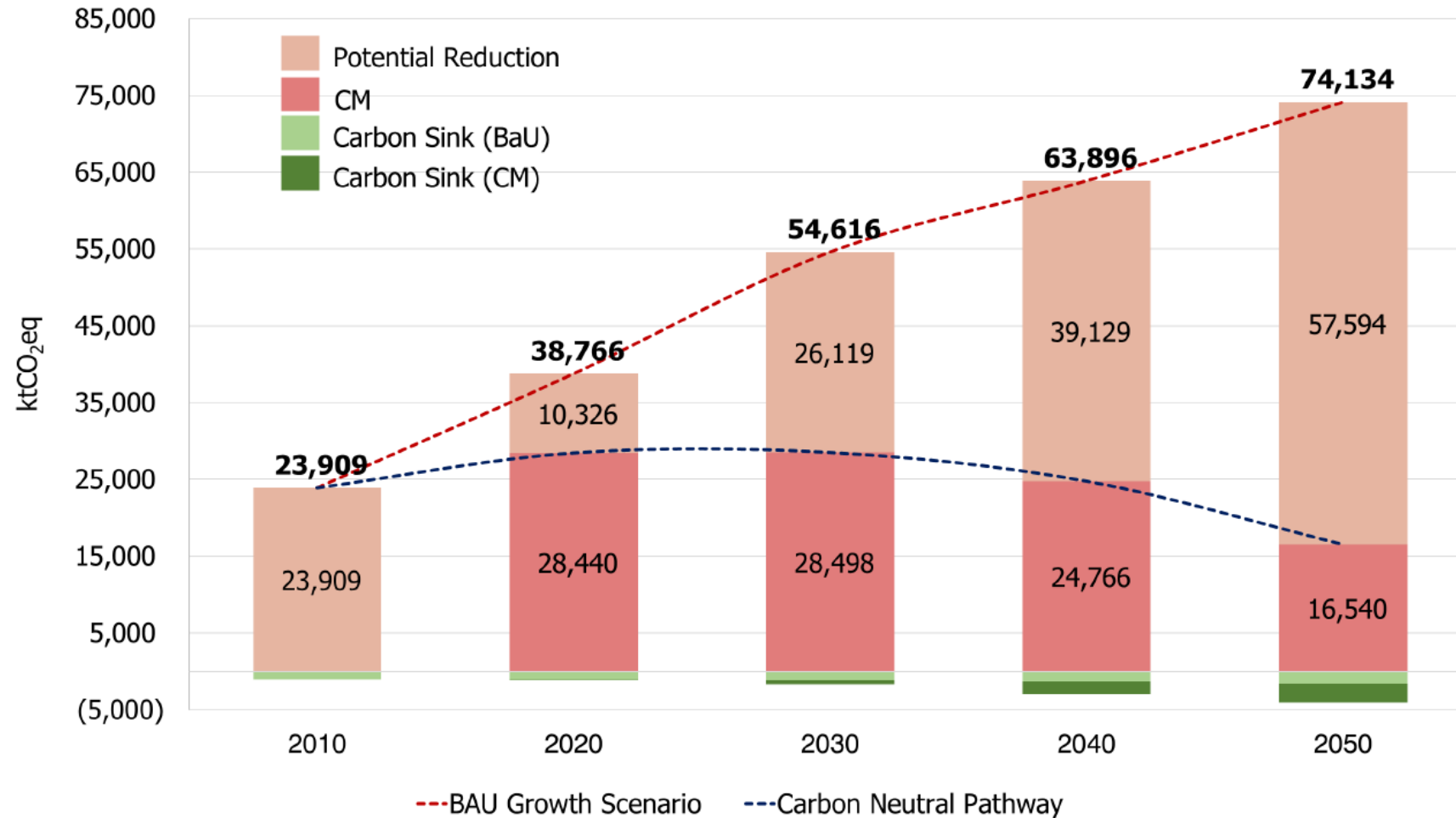


Figure 4.6 : Kuala Lumpur Carbon Neutrality Pathways
 Source : Kuala Lumpur Carbon Neutral 2050 Study



Quezon City is the largest city in Metro Manila, accounting for at least quarter of the land area of the metropolis. It is also the second largest city in the Philippines, with a total land area of more than 160 km². The city is also considered the most populated in the country with approximately 3 million people. Through the years, Quezon City's environmental program has evolved from adopting a mere "clean and green" strategy to a more holistic and comprehensive one taking into consideration the global challenge of addressing the impacts of climate change. The City Government, with its continuing effort to save the environment, has a vision towards a Low Carbon and Sustainable City in the hope of becoming a model for other local government units to emulate. In response to climate change and to comply with the Climate Change Act of the Philippines, Quezon City developed "Quezon City Local Climate Change Action Plan 2017-2027" (QC LCCAP). Projects, Programs, and Activities (PPAs) were identified in LCCAP in accordance with seven pillars of the National Climate Change Action Plan, namely: Food Security, Water Sufficiency, Environmental and Ecological Stability, Human Security, Climate-Friendly Industry and Services, Sustainable Energy, and Knowledge and Capacity Development.

Currently, the QC LCCAP is focused on climate change adaptation. With this said, Quezon City is now developing its climate change mitigation roadmap to be integrated in the QC LCCAP which deal with the City's protocol in Greenhouse Gas (GHG) emissions inventory and other related low carbon initiatives as well as setting the City's emissions reduction target. Moreover, a Memorandum of Understanding (MOU) on Developing Low-Carbon City in Cooperation between Quezon City and Osaka City is concluded for the realization of low carbon society in Quezon City last 30 August 2018. This research on low carbon society (LCS) scenario is also expected to contribute processes formulating various concrete measures setting the GHG emission reduction targets of Quezon City and update the QC LCCAP focused on mainstreaming both adaptation and mitigation aspects.

This research sets a framework wherein a target year of the LCS scenario for Quezon City is 2030 and a base year for estimation is 2016. Main GHG to be calculated will be Carbon Dioxide (CO₂) while energy related activities such as industry, commercial, residential and transport sectors will also be highlighted. Data and information on socioeconomic activities and energy demand for this research are collected from a variety of sources used as reference including both regional and national statistics and international reports. Said data and information are input to Extended Snapshot Tool (ExSS)

to quantify socioeconomic indicators and CO₂ emissions in both the base year and the target year. ExSS was developed by Asia-Pacific Integrated Model Team (AIM) and applied to a lot of cities to design LCS scenarios. Business as Usual (BaU) scenario and Low Carbon Society (LCS) scenario, are prepared to analyze reduction potential of CO₂ emissions in Quezon City. In BaU scenario, it is assumed that there is no policy or technology intervention to reduce carbon emissions, while implementation of low carbon projects to reduce emissions is assumed in LCS scenario.

CO₂ emissions in 2016 are estimated to be 6,129 ktCO₂ in Quezon City and it will double by 2030 in BaU scenario. On the other hand, CO₂ emissions in 2030 will be reduced by 50% in LCS scenario compared with BaU scenario. LCS projects by the Quezon City contributes half of the reduction while other results is from the improvement of CO₂ emission factor in national electricity grid. Various projects under four LCS actions are promoted in LCS scenario. It is concluded that Quezon City can reduce 50% of carbon emissions in 2030 due to the effort of both City and the country. Given the rapid growth of the city, it is no less ambitious than the national target of 70% reduction, which is shown in Intended National Determined Contribution (INDC) of Philippines.

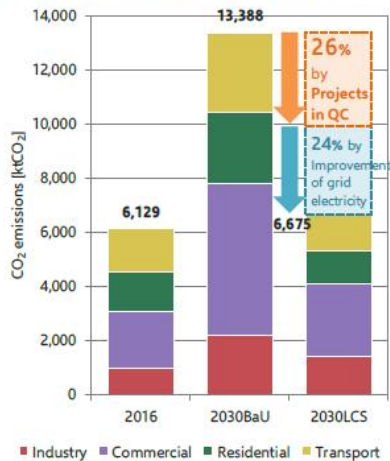


Figure 1. CO₂ Emissions and Reductions



Quezon November, 2018



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Phnom Penh March, 2018



[PDF: 0.6MB](#)

Can Tho February, 2018



[PDF: 0.3MB](#)

Semarang November, 2017



[PDF: 1.4MB](#)

Hai Phong November, 2016



[PDF: 2.0MB](#)

Danang October, 2016



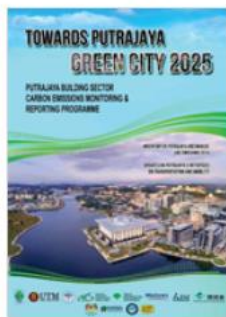
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Ho Chi Minh January, 2016



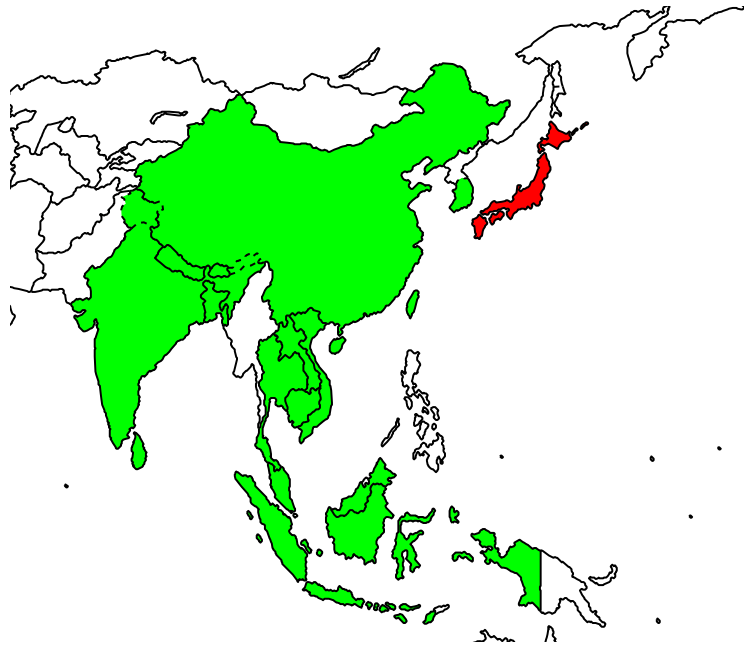
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Putrajaya November, 2015



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International Network of AIM (Asia-Pacific Integrated Model)



The 27th AIM International Workshop (Online; Sep. 30 & Oct. 1, 2021)

- Asian countries will update their mitigation target and roadmap to achieve the 2/1.5 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 and their long-term low carbon/decarbonized scenarios.
- <https://www-iam.nies.go.jp/aim/index.html>

Presentation by
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