Thematic Bonds for Affordable Green Housing in Asia and the Pacific
A Case Study of Thailand’s National Housing Authority

I. The Need to Rapidly Scale Up Finance for Sustainable Housing in Asia

The Asian Development Bank (ADB) has estimated that the Asia and the Pacific region will need to invest $1.7 trillion per year in infrastructure, including housing, until 2030 to maintain growth momentum, tackle poverty, and respond to climate change. These financing needs have likely increased since the coronavirus disease (COVID-19) pandemic, with government budgets reallocated to urgent relief efforts at the expense of planned infrastructure investment. The World Bank estimates that in a baseline scenario that COVID-19 will push an additional 71 million people into poverty, and this could rise to as many as 100 million people in a downside scenario. Increasingly, there is an urgent incentive to mobilize private, institutional, and commercial sources of investment—especially the capital markets—at scale across developing Asia and the Pacific.

The need for sustainable housing. Globally, buildings used for housing are one of the largest sources of greenhouse gas emissions (Figure 1). Developing countries like Thailand are realizing an opportunity for governments to mobilize private sector funds through capital markets for social purposes such as affordable housing for low-income residents. There is growing recognition in Asia that its rapid economic growth will challenge governments to not only meet the demand for affordable housing, but to do so in a sustainable manner as they strive to achieve the United Nations (UN) Sustainable Development Goals (SDGs) and the global climate change commitments made under the Paris Agreement and the Glasgow Climate Pact.

The SDGs were adopted by all UN Member States in 2015 and contain 17 goals to achieve a better and more sustainable future for all by 2030 (Figure 2). SDGs 1, 7, 10, 11, and 13 are directly relevant to achieving sustainable and affordable housing in Asia, and rapid mobilization of housing finance has the potential to contribute significantly to each one.

The Paris Agreement has been the driving force for many state-based laws to limit greenhouse gas emissions and set net-zero emission targets. Although the Paris Agreement is a state-based agreement, investors, asset owners, and asset managers are increasingly looking to align their portfolios with its goals and to monitor and limit greenhouse gas emissions. In some cases, they are required to align their portfolios with changes in state-based legislation.

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Figure 1: The Share of Buildings in Global Greenhouse Gas Emissions (CO₂ equivalent)

- Transport: 23%
- Industry: 32%
- Other: 17%
- Non-residential buildings: 11%
- Residential buildings: 10%
- Buildings construction industry: 7%

CO₂ = carbon dioxide.

Figure 2: The United Nations Sustainable Development Goals

II. The Emergence of Thematic Bonds

Bonds and other capital market instruments have a proven ability to quickly tap into global pools of institutional and pension funds, including social impact and insurance funds, projected to be worth between $45 trillion and $60 trillion globally. The bond market has seen significant growth in thematic instruments with a plethora of terms and labels. Along with the prominence over the last decade of the Paris Agreement and the SDGs, there has been an increase in the use of green bonds, social bonds, sustainability bonds, and transition bonds to raise financing. There are now more than 30 different names for bonds and other debt issuances that contain an environmental, social, or governance (ESG) component. Some thematic bond issuances—e.g., green bonds, blue or water bonds, and forest bonds—address environmental concerns. Others are named after the sector for which the financing is being raised, such as housing, education, or gender. Still others are known as sustainability or SDG-linked bonds, to signal a commitment by the issuer to specific themes. In the context of public offerings on international markets, it is important to define the underlying economic rationale of each type of bond, since bonds require detailed disclosure with respect to the types of products offered. It is critical to have a clear understanding of the express or implied risks associated with representations made regarding the scope of these themed financial products. The more common thematic bond categories emerging in the global marketplace are described below.

**Social bonds** are use-of-proceeds bonds that raise funds for new and existing projects including affordable basic infrastructure such as affordable housing, employment generation, food security, and socioeconomic advancement.

**Sustainability bonds** are any type of bond instrument where the proceeds will be exclusively applied to finance or refinance a combination of green and social projects and are usually aligned with the International Capital Market Association’s (ICMA’s) Sustainable Bond Guidelines or the Sustainability Bond Principles.

**Green bonds** were created to fund projects that have positive environmental outcomes or that contribute to climate change mitigation and adaptation. They are frequently oversubscribed, and there is some evidence of a demand-driven “greenium” for bond issuers in the form of a cheaper cost of capital for green bonds compared to conventional “vanilla” bonds.

**Environmental, social, and governance bonds** generally refer to any issuance with an ESG aspect (including green bonds or social bonds). They are typically linked to an issuer’s overall sustainability credentials. There are no restrictions on how proceeds from these bonds can be used, which helps explain their growing popularity.

**SDG bonds** are defined by referencing one or more of the 17 SDGs. Investors can implement investment strategies that explicitly target SDG themes and sectors.

Immediately after the COVID-19 pandemic started, the green bond market was overshadowed by social and sustainability bonds; this trend was driven by an increasing need for financing inclusive and poverty alleviation projects, and to meet the SDGs. Climate-related green bonds are now once again emerging as one of the keys to stimulating a green recovery.

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Figure 3: Growth of Issuances of Green, Social, and Sustainability Bonds from 2015 to 2020


Thematic Bonds for Green Housing in the Asia and Pacific Region

The housing sector represents a growing and significant market for thematic bonds. Housing demand in Asia is on the upswing as Asia experiences faster income growth and urbanization than any other region in the world. There is growing potential in the development of housing bonds to finance the rapidly growing demand for homes as countries in Asia urbanize. Developing a market for housing bonds in Asia and the Pacific would increase access to home loans at a time of rising demand and would diversify housing finance, which is traditionally provided by commercial banks. The emerging thematic bond market for housing is already starting to help countries in the region raise funds to build more housing units, meeting the increasing housing demand with more energy and other resource-efficient designs, while also contributing to sustainable economic development through green job creation. The experiences described below in the case of Thailand, as well as the Republic of Korea and New Zealand, are instructive for the development of sustainable and affordable housing across the Asia and the Pacific region.

Thailand’s National Housing Authority: A Leader in Sustainable, Affordable Housing. With ADB assistance, Thailand’s National Housing Authority (NHA) seeks to meet its Paris commitments and contribute to the SDGs by mobilizing capital market investments to finance safe, affordable, and sustainable housing for its low-income citizenry. For example, the NHA recently issued a Sustainability Bond—the first such bond issued by any state-owned enterprise (SOE) in ASEAN.

Thailand’s National Housing Authority

The National Housing Authority vision. Thailand’s National Housing Authority is a state-owned enterprise with a mandate to develop affordable housing for low-income households in Thailand. Since its establishment, the NHA has adopted the Sufficiency Economy Philosophy developed by King Bhumibol Adulyadej, which is based on the fundamental principles of Thai culture: moderation, prudence, and social immunity, using knowledge and virtue as guidelines for living, and emphasizing how intelligence and perseverance are key to real happiness. In its Strategic Plan, the NHA aims to achieve the vision of being “a high-performance organization for urban housing and community development for people particularly from low income households, to help them have a better quality of life and living environment.”

To realize this vision, the NHA is carrying out the following activities:

• Providing more housing, especially for low-income households;
• Redeveloping urban communities for a better living environment, together with developing new towns to serve urban growth; and
• Developing communities to be cohesive and capable of self-management.

Providing affordable housing within cohesive communities will also help reduce the impact of COVID-19 and increase resilience to future pandemics, which will be felt most devastatingly in poor and densely populated urban areas where overcrowding also makes it difficult to follow recommended measures such as social distancing and self-isolation (footnote 10).

The NHA will provide financial assistance to about one-third of the targeted group of 2.27 million households (approximately 650,000 households) that cannot access housing financing from regular financial institutions. During the next 5 years (2022–2026), the NHA plans to raise B134 billion (about $4 billion) to fund 16 projects across the country.

National Housing Authority housing projects in Thailand. A range of affordable housing units at NHA developments in Thailand. During the next 5 years (2022–2026), the NHA plans to raise $4 billion to fund affordable housing projects across the country, and many of these housing units will be more energy-efficient green housing.

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From social to sustainability bonds. In recent years, the NHA has been focused on integrating sustainable urban housing concepts and approaches into their assets, including energy efficiency measures, eco-housing concepts, and national energy efficiency labels for buildings.

In 2020, the NHA initiated an effort to raise capital in the domestic bond market through the issuance of social bonds. In August 2020, with support from ADB, the NHA successfully raised $200 million through its maiden social bond. ADB assisted the NHA in the development of its social bond framework, with the issuance of a second-party opinion from the international assurance and risk management company, DNV. The NHA bonds will refinance the development of housing projects to serve low- and middle-income people, who will be able to either buy or lease housing units. The NHA issued a subsequent social bond for $100 million in March 2021, with ADB assistance. The bond issuance is expected to benefit 13,569 households or 54,000 people. The bonds are divided into three tranches: 5-year maturity totaling B1 billion, 10-year maturity totaling B2.8 billion, and 15-year maturity totaling B3 billion. The 5-year bonds carry a coupon rate of 1.02% per annum, the 10-year bonds are 1.64% per annum, and the 15-year bonds are 1.90% per annum.

The NHA Sustainable Financing Framework. In September 2021, the NHA announced a new framework called the NHA Sustainable Financing Framework. It lays out principles and guidelines to ensure that the affordable housing and basic services provided by the NHA are accessible by all gender groups and are aligned with the SDGs.

Green housing in NHA’s sustainability bond. The NHA successfully issued a sustainability bond of B1.1 billion ($32 million) in September 2021. The three main areas of focus outlined in the NHA’s 2021 sustainability bond are affordable housing, socioeconomic advancement and empowerment, and green buildings (Table 1). This was the first sustainability bond issued by an SOE in Southeast Asia. The issuance of the sustainability bond required the NHA to include evidence of eligible green assets that meet the Association of Southeast Asian Nations (ASEAN) and international standards for green buildings or affordable housing which can be included as the basis for their bond issuance, in addition to the usual social assets.

Table 1: Alignment of Thailand National Housing Authority’s Affordable Housing and Socioeconomic Empowerment Goals with the United Nations Sustainable Development Goals

<table>
<thead>
<tr>
<th>Eligible Categories</th>
<th>Sample Eligible Projects</th>
<th>UN SDG Alignment and Commitments/Contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affordable Housing</td>
<td>• Increase in number of affordable and decent homes available for target populations</td>
<td></td>
</tr>
<tr>
<td>Socioeconomic Advancement and Empowerment</td>
<td>• Empowering target populations especially women to capable to generate income for their living and paying for affordable housing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Good community environmental management</td>
<td></td>
</tr>
<tr>
<td>Green Building</td>
<td>• Increase in number of energy and water efficient homes available for target population</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Contribution toward a net zero carbon society through reduction of greenhouse gas emissions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Increase number of eco-friendly construction products and/or appliances to market</td>
<td></td>
</tr>
</tbody>
</table>

SDG = Sustainable Development Goal, UN = United Nations.
**Building ratings and energy savings in the NHA green housing units.** Energy and sustainability labeling for buildings plays a major role in establishing the credibility of green and sustainable bonds (Box 1). As the NHA was developing its sustainability bond in 2021, ADB supported an assessment of different national and international green building labels, which covered several aspects including applicability, methodology, impact, additional investments, and credibility (Table 2). The assessment showed that the internationally acclaimed Leadership in Energy and Environmental Design (LEED) certification cannot be practically applied to Thai low-income housing, while a national rating system called Electricity Generating Authority of Thailand (EGAT) Label No. 5 is more appropriate for Thai conditions. This valuable building rating system rewards energy-efficiency construction practices such as the use of aerated concrete as a construction material, tinted glazing, external overhang shading, sufficient thermal insulation under the roof, and energy-efficient air-conditioning. ADB experts recommended using EGAT Label No. 5 for this bond issuance.

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**Box 1: Global Environment Facility Grant for Green Housing**

In May 2021, the Global Environment Facility (GEF) approved a $3.1 million grant to accelerate the National Housing Authority’s (NHA’s) green housing effort, including (i) an energy efficient green home design and labelling scheme, (ii) incentive mechanisms for promoting energy efficient green homes, and (iii) awareness raising and capacity building for promoting energy efficient green homes. The NHA will utilize these inputs to enhance the sustainability of 130,000 new buildings planned for construction by 2027.


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**Table 2: Comparison of Green Labels and Standards in Thailand**

<table>
<thead>
<tr>
<th>Label/Standard</th>
<th>Certification Levels</th>
<th>Mandatory</th>
<th>Homes</th>
<th>Methodology</th>
<th>Additional construction costs</th>
<th>Certification Body</th>
<th>International Prestige</th>
<th>Energy</th>
<th>Materials</th>
<th>Water</th>
<th>Well-being</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thai Building Energy Code</td>
<td>Certified</td>
<td>✓</td>
<td>*</td>
<td>BEC Calculation</td>
<td>Medium Auditors</td>
<td>Internationally low, locally well-known</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TREES</td>
<td>Certified, silver, gold, platinum</td>
<td>✓</td>
<td>✓</td>
<td>BEC Calculation</td>
<td>Medium TGBI</td>
<td>Low locally well-known</td>
<td>X X     X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eco Village</td>
<td>Certified, silver, gold, platinum</td>
<td>*</td>
<td>✓</td>
<td>Perspective (checklists)</td>
<td>Low *</td>
<td>Low, even locally</td>
<td>X X     X X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Label No. 5</td>
<td>Certified</td>
<td>*</td>
<td>✓</td>
<td>BEC Calculation</td>
<td>Medium EGAT</td>
<td>Locally well-known, but not for buildings (yet)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDGE</td>
<td>Certified</td>
<td>*</td>
<td>✓</td>
<td>Online Calculation Tool</td>
<td>Low Auditors Medium</td>
<td>X X     X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEED</td>
<td>Certified, silver, gold, platinum</td>
<td>*</td>
<td>✓</td>
<td>Energy Star</td>
<td>High USGBC</td>
<td>High X X     X X X</td>
<td></td>
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</tbody>
</table>


The ADB experts compared the performance of NHA’s “business-as-usual” building design to the NHA homes that have been built to the EGAT Label No. 5 standard. The analysis found that the Label No. 5 houses achieve improved energy savings of 25% on average, with a range from 21% to 32% across the different housing types. Going forward, ADB suggests adoption of the international EDGE certification standard for future bond issuances, since this is a well-known international standard that can be applied to the NHA housing stock. The EDGE standard considers not only the environmental impact of energy demand, but also the impact of construction materials and water demand.

In its September 2021 sustainability bond issuance, the NHA included nearly 3,000 households (15% of the asset pool), which were certified as meeting the EGAT Label No. 5 standard. These energy-efficient households reduce energy consumption of the asset pool by 2,400 megawatt hours (MWh) a year, or 117,900 MWh over the lifetime (50 years) of the housing assets. This translates into a value of B413 million ($12.1 million), with the benefits being enjoyed by the thousands of families living in NHA housing.

Some examples of international practices can be found in Boxes 2 and 3.

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**Box 2: Profile of the Korea Land & Housing Corporation**

The Korea Land & Housing Corporation (LH) is a government-owned entity responsible for the development, maintenance, and management of land and housing in the Republic of Korea. LH develops public housing, administers housing welfare programs, and oversees the construction of towns, low-carbon cities, and industrial zones. In 2018, LH decided to develop a Korea Land & Housing Corporation Social, Green and Sustainability Bond Framework (the Framework) under which it issues multiple green, social, and sustainability bonds and uses the proceeds to finance and refinance, in whole or in part, existing and future projects that advance LH’s sustainability goals and promote the United Nation’s (UN’s) 2030 Agenda for Sustainable Development. The LH Framework is in alignment with the widely accepted guidance from the International Capital Market Association’s (ICMA’s) Social Bond Principles 2018, Green Bond Principles 2018, and Sustainability Bond Guidelines 2018.

The LH Framework defines three areas for the use of net bond proceeds.

(i) **LH Social Bond** proceeds are allocated for housing welfare projects, including its public build-to-rent program, public buy-to-rent program, and a deposit-based (Jeonse) rent program.

(ii) **LH Green Bond** proceeds are allocated for eco-friendly housing projects, including green buildings, energy efficiency, and clean transportation. Green buildings must meet the following standards to be eligible for LH green bonds:

- Construction of energy saving eco-friendly houses must meet international (equivalent of minimum Leadership in Energy and Environmental Design [LEED] Gold) and national standards (level 1+ or higher for the Building Energy Efficiency Certification; or level 2 or higher for G-SEED certificates).
- In addition to international and national standards, LH properties must reduce energy consumption by a minimum of 15% and could include installing light-emitting diode (LED) lighting system and LED street lamps and improving ventilation systems.

(iii) **LH Sustainability Bond** proceeds are allocated for projects that have a combination of green and social benefits such as renewable energy, waste management, and water management. In general, net proceeds shall be allocated for the financing and/or refinancing of existing projects (with a 3-year look-back period) or of new projects that provide these benefits.

Box 3: Profile of Housing New Zealand Corporation

The Housing New Zealand Corporation and its subsidiaries including Housing New Zealand Limited (together, HNZ) provide housing services for people in need. In 2019, HNZ decided to develop a Sustainability Financing Framework to further embed environmental and social considerations into its processes and practices across core HNZ business activities. The purpose of the HNZ Framework is to demonstrate HNZ’s intention to support Sustainability Financing Transactions (SFT), with proceeds earmarked to finance, or refinance, projects that will generate positive outcomes in environmental and social well-being.

Regarding housing, all proceeds raised from each SFT from HNZ will be utilized for new construction of the retrofit of existing social housing, as well as for providing key housing-related services that produce social and well-being outcomes such as HNZ’s Intensive Tenancy Management service. SFT proceeds will not be used for financing other categories of housing required by the Government of New Zealand’s priorities such as emergency, transitional, affordable, and market housing.

Under the framework, HNZ may issue Green Bonds, Social Bonds, Green Loans, Sustainability Bonds, or Well-being Bonds, which are Sustainability Bonds that are also aligned with New Zealand’s Living Standard Framework. The bonds issued under the Framework will be aligned, as appropriate, for the type of bond issued, with the International Capital Market Association’s (ICMA’s) Green Bond Principles (GBP) 2018, Social Bond Principles 2018, Sustainability Bond Principles 2018, or any of these as they may be subsequently amended.

With respect to Green Bonds issued under this Framework, in addition to alignment with the GBP, HNZ may also choose to seek certification of Green Bonds in compliance with the requirements of the Climate Bonds Standard Version 2.1, or as they may be subsequently amended, subject to the availability of specific technical criteria for the applicable sector.

To be eligible for HNZ’s green bond or loan, new construction and/or retrofit of social housing has, or will receive, a minimum 6-Star Homestar rating. Launched in 2010 by the New Zealand Green Building Council, Homestar is an independent rating tool that assesses the health, efficiency, and sustainability of New Zealand homes. A Homestar rating is a score out of 10, where 1 is significantly below par and 10 meets current international best practices.

III. Looking Ahead

The ASEAN sustainable finance market has maintained rapid growth despite the negative impacts of COVID-19, focusing attention on the need for a sustainable economic recovery. A keen awareness of environmental threats has permeated the global financial sector, while the rise of financial instruments with a social and sustainability theme has mobilized more private sector funding and expanded its scope to a broader range of environmental and social benefits. Mirroring this trend, the issuance of green, social, and sustainability (GSS) bonds in ASEAN has also grown rapidly. The overall sustainable finance market performed strongly in 2020 despite COVID-19, with $12.1 billion of GSS bonds issued in 2020 in ASEAN (Figure 4). The cumulative issuance of GSS bonds in ASEAN now stands at $29.4 billion.

With a combined gross domestic product (GDP) of $3.11 trillion in 2020, ASEAN is among the fastest-growing regions in the world. However, its member countries are also highly vulnerable to the adverse effects of climate change, making transitioning to a sustainable and resilient economy a necessity. In recent years, with supportive market regulations in place, a buoyant green finance sector has emerged. Various themes have been adopted by issuers who have increasingly used distinct thematic debt instruments, including COVID-19 and post-pandemic, recovery-related bonds, to open a path toward more sustainable development in ASEAN countries.

One of the main challenges in scaling-up the issuance of thematic bonds for affordable and sustainable housing is the preparation involved. This process includes assessing and improving issuer credit ratings and governance aspects; the underlying quality of subprojects; adherence to green, sustainability, or related principles; market sizing; and the timing of issuance. In the longer term, it will be critical for issuance of such bonds to extend to SEOs and local governments, requiring greater financial rigor and discipline within such entities. At the same time, much more needs to be done to de-risk the process of thematic bond issuances and to ensure that this support is part of a wider national approach to foster an enabling policy and regulatory ecosystem, including road maps for sustainable finance for affordable housing.

ADB provides a range of technical support and assistance for public and private sector clients who are issuing bonds. The support includes activities such as initial discovery and scoping; designing and reviewing their Thematic Bond Frameworks; development of a project selection and governance process; alignment with international best practices and standards for green, social, and sustainability bonds; coordination with external reviewers; support for third-party certification; support for post issuance reporting (e.g., allocation and impact reporting); participation in the bond launch team alongside lawyers, bookrunners, and bankers; de-risking and credit enhancement mechanisms; and embedding the bond transaction in a wider sustainable finance agenda.
Over the past several years, ADB has supported several landmark issuances of thematic sovereign and private sector bonds in ASEAN, including the first certified climate bond in Asia and the Pacific in 2016 (for AP Renewables in the Philippines); the first green bond issued by a Thai energy company (B. Grimm in 2018); the first green bond for wind power in Thailand (Energy Absolute in 2019); and the first sustainability bond issued by a state-owned enterprise in ASEAN (Thai National Housing Authority in 2021).

ADB and ASEAN Catalytic Green Finance Facility (ACGF) can help in a number of these areas through technical assistance and lending products. Their support to Thailand’s NHA to access capital markets to finance affordable and sustainable housing for its low-income citizens exemplifies this approach.

Acknowledgments
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For more information on ADB support and the ACGF, please e-mail Anouj Mehta at amehta@adb.org.

In this publication, “$” refers to United States dollars, unless otherwise stated.

ADB recognizes “Korea” as the Republic of Korea.
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The Asian Development Bank (ADB) and the Association of Southeast Asian Nations (ASEAN) Catalytic Green Finance Facility (ACGF) are providing technical assistance to help Thailand’s Ministry of Finance and the National Housing Authority (NHA) design green, social, and sustainability bonds, laying the groundwork for similar issuances throughout the Asia and Pacific region to help finance a post-COVID-19 green recovery.

About the Asian Development Bank

ADB is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. Established in 1966, it is owned by 68 members —49 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

About the ASEAN Catalytic Green Finance Facility

The ASEAN Catalytic Green Finance Facility (ACGF) is an innovative finance facility under the ASEAN Infrastructure Fund dedicated to accelerating green infrastructure investments in Southeast Asia. It supports ASEAN governments to prepare and source public and private financing for infrastructure projects that promote environmental sustainability and contribute to climate change goals. The ACGF is owned by the 10 ASEAN member states and ADB, which also administers the facility.