

# What's AZEC?



What is the Asia Zero Emission Community?

アジア・ゼロエミッション共同体とは？

English





Sihanoukville Port, Cambodia

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## Introduction

The “Asia Zero Emission Community” (AZEC) has held four high-level meetings since its inception, resulting in joint statements, over 200 memoranda of understanding (MoUs), the establishment of a new research center, and a 10-year action plan.

In particular, the MoUs announced at each high-level meeting represent agreements between Japan and the partner countries’ participating entities (companies and public agencies). These MoUs reflect how the AZEC participants intend to pursue and materialize business opportunities through AZEC.

In this report, we aim to answer the question “What’s AZEC?” based on publicly available information and to analyze the MoUs signed under the AZEC.

### Executive summary

AZEC was proposed in 2022 by then Japanese Prime Minister Fumio Kishida and was launched in March 2023 as a platform to promote cooperation towards carbon neutrality/net-zero emissions in Asia. AZEC has 11 participating countries, which include nine member states of the Association of Southeast Asian Nations (ASEAN), Australia, and Japan.<sup>1</sup>

It is part of the Green Transformation (GX) Strategy, a key element of Japan’s industrial strategy. As stated by former prime minister Kishida when proposing AZEC, its particular emphasis is placed on using Japanese technologies, systems and know-how in areas like hydrogen and ammonia.<sup>2</sup>

From March 2023 to October 2024, a total of 217 MoUs<sup>3</sup> have been signed under AZEC, all of them involving Japanese public agencies<sup>4</sup> or companies. Among partner countries, Indonesian public agencies or companies show the highest engagement, participating in 40% of MoUs (82 MoUs).

1 Ministry of Economy, Trade and Industry (METI) [website](#)

2 Prime Minister’s Office of Japan [website](#) January 17, 2022

3 In this report, “MoU” includes MoU and other cooperation agreements under AZEC. In general, MoU is a document that records the details of an agreement between two companies or organizations, which has not yet been legally approved.

4 In this report, “public agencies” is a broader term that encompasses various public-sector entities, including national and local governments (e.g., ministries and departments), government organizations, and international organizations. In contrast, “government organizations” refer to entities that operate under the umbrella of the national government to carry out specific mandates, such as resource development, financing, and technology advancement (see [1-5\(1\)](#)).

About 30% (67 MoUs) of all MoUs are for cooperation on fuels such as hydrogen and ammonia, biomass and biofuel, liquefied natural gas (LNG), and e-fuel. Among these, hydrogen and ammonia, including for use in the thermal power sector, represent the largest number of MoUs (29 MoUs). Other significant cooperation areas include general relationship building, agro-ecosystem management, renewables, greenhouse gas (GHG) accounting, carbon credits, and carbon capture, utilization and storage (CCUS). In contrast, the area with the fewest MoUs is energy efficiency (3 MoUs).

Among Japanese entities, government organizations accounted for the largest share (43 MoUs), followed by energy companies (35 MoUs). More than 10 MoUs were signed by corporate entities in each of the energy, GHG accounting / carbon credits, construction and infrastructure, general trading, and machine manufacturing sectors. These MoUs show that Japanese government organizations are taking the initiative to sign MoUs directly with partner countries' entities in areas of high business risk for Japanese companies and are facilitating the development of cooperative projects involving Japanese companies particularly in the power and energy sectors. This indicates that, under the active leadership and support of the government, Japanese companies across sectors are seeking to expand their business activities through AZEC. On the other hand, among the participating entities of partner countries, energy companies stand out with 90 MoUs (41%), indicating that Japan is particularly interested in energy investment in these countries.

Among Japanese companies, those in the GHG accounting and carbon credit sector rank second after energy companies in terms of MoU participation. Many of the MoUs signed by these companies pertain to generating carbon credits through agro-ecosystem management, GHG accounting in the manufacturing sector, or carbon credit trading. This suggests that Japan is aiming to acquire carbon credits through agro-ecosystem management projects in partner countries, while also seeking to enter the GHG accounting and carbon trading business. In contrast, projects related to renewables or energy efficiency make up less than 10% of the total, indicating that these areas are currently lower priorities.

In addition, several joint statements include references to nuclear energy. Although no MoUs related to nuclear energy have been signed to date, this suggests that participating countries, including Japan, have an interest in incorporating nuclear energy as a potential area of future cooperation.

The MoU analysis suggests that Japan's primary interest lies in building supply chains



for various fuels in AZEC participating countries and exporting Japanese technologies—most notably hydrogen and ammonia co-firing in the thermal power sector. Projects related to fossil fuels or thermal power raise questions about their contribution to emission reduction in line with the Paris Agreement. Thus, these projects require close evaluation regarding their emission reduction impact and cost-effectiveness.

For Japan to foster fair and constructive partnerships with AZEC partner countries and make a meaningful contribution to decarbonization in Asia through its efforts towards carbon neutrality, it is essential to assess whether AZEC projects and initiatives align with both the development pathways of partner countries and net-zero emission pathways. Support should be focused on cost-effective technologies in reducing emissions, such as renewables and energy efficiency. Additionally, greater transparency is needed through the disclosure of financial support for AZEC and progress updates on supported projects.



Indonesia, Suralaya Coal-fired Power Plant

# 01 What is AZEC?

## 1-1 The launch of AZEC

AZEC was first publicly proposed by then Prime Minister Fumio Kishida in his inaugural policy speech to the Diet in January 2022. In this speech, he emphasized Japan's commitment to contribute to Asia's decarbonization by leveraging Japanese technologies, systems and know-how in areas like hydrogen and ammonia.<sup>5</sup> Based on this proposal, AZEC was officially launched in March 2023 at the first AZEC Ministerial Meeting, with 11 participating countries.

Figure 1: AZEC partner countries



Prepared by Climate Integrate from [website](#) of METI (in Japanese)

<sup>5</sup> Ibid [footnote 2](#)

## 1-2 AZEC as Japan's GX strategy

AZEC has been promoted by the Japanese government as part of its industrial policy known as the Green Transformation (GX) strategy.<sup>6</sup> GX is an initiative launched by the government in 2022 to “transform our industrial and social structures centering around fossil energy sources, long established since the Industrial Revolution, into ones based on clean energy.”<sup>7</sup> The most recent version of this strategy, the “GX 2040 Vision,” states that the promotion of GX through practical and diverse approaches can help bridge energy access challenges in the Global South. To support the realization of GX in Asian countries, the strategy further emphasizes Japan’s commitment to establishing rules for creating markets that value decarbonization technologies and services.<sup>8</sup>

Consistent with GX strategy, AZEC has been highlighting the importance of achieving a common goal of “net-zero emissions through various pathways” and a triple breakthrough of simultaneously achieving “decarbonization, economic growth, and energy security” as AZEC principles.<sup>9</sup>

## 1-3 Leaders' and ministerial meetings

### (1) Overview

Since its official launch at the first ministerial meeting in March 2023, AZEC has held four meetings — two ministerial and two leaders' meetings (Figure 2) — with a joint statement issued at each meeting (Table 1). The first Leaders' Meeting in December 2023 led to a proposal to establish the Asia Zero Emission Center within the Economic Research Institute for ASEAN and East Asia (ERIA) ([Box 1](#) (p.14)). In August 2024, the second Ministerial Meeting launched the Asia Zero Emissions Center and three sectoral initiatives. Subsequently, the second Leaders' Meeting in October 2024 adopted a 10-year action plan,<sup>10</sup> which focuses on advancing AZEC solutions, AZEC sectoral initiatives, and Japan/Australia-led projects. The third Ministerial Meeting is scheduled for September 30, 2025,<sup>11</sup> and the third Leaders' Meeting for October 28, 2025.<sup>12</sup>

6 As Japan's GX strategy, the “[Basic Policy for the Realization of GX](#)” was first formulated in February 2023. It was later revised in July 2023, alongside the enactment of the GX Promotion Act, into the “[Strategy for the Promotion of a Decarbonized Growth-Oriented Economic Structure](#)” (GX Promotion Strategy) (in Japanese). In February 2025, the “[GX 2040 Vision](#)” (in Japanese) was released as a revised version of the GX Promotion Strategy. All versions of the GX strategy position AZEC as a key component of Japan's international deployment strategy.

7 METI “[Basic Policy for the Realization of GX](#)” February 10, 2023 (in Japanese)

8 METI “[GX 2040 Vision](#)” February 2025 (p.19) (in Japanese)

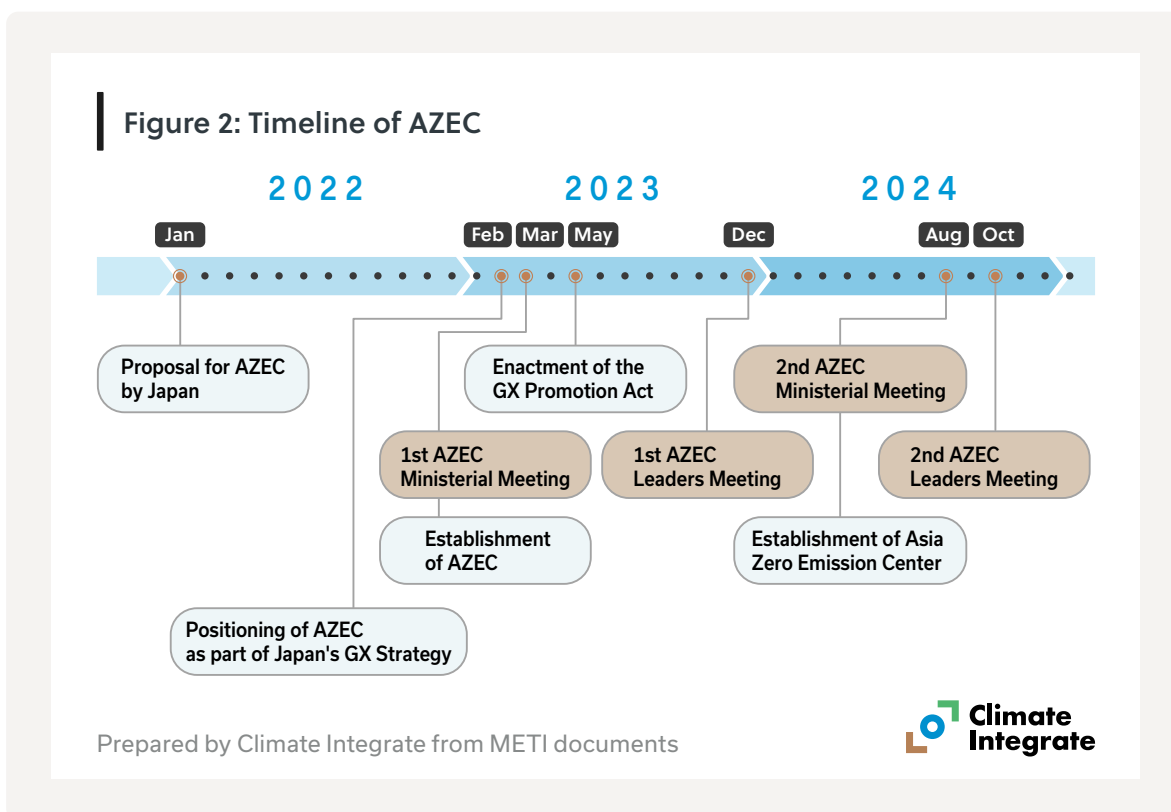
9 METI [Press release](#) December 18, 2023

10 AZEC “[AZEC Leaders' Joint Statement: Action Plan for the Next Decade](#)” October 11, 2024

11 ASEAN MALAYSIA 2025 [website](#)

12 ASEAN MALAYSIA 2025 [website](#)





## (2) MoUs

As the meetings progressed, the number of MoUs increased (28 at the first meeting, 121 at the fourth), reaching a total of 217 MoUs. At each of the first three meetings, a list of newly signed MoUs was presented. However, at the fourth meeting (the second Leaders' Meeting, October 2024), the list of 121 cooperation agreements presented included 68 MoUs that had already been signed at the previous second Ministerial Meeting, plus new MoUs, letters of intent and other cooperation agreements, including an agreement to organize the next regular conference (6th ASEAN-Japan Smart Cities Network High-Level Meeting). A detailed analysis of AZEC MoUs is provided in "[02. MoUs under AZEC](#)" section of this report.

## (3) Technology areas referenced in AZEC joint statements

The AZEC joint statements cover various technology areas. Table 2 shows that the range of technology areas mentioned in each joint statement has expanded over time. Among them, six technology areas have appeared consistently in all four meetings: hydrogen and ammonia; bioenergy and biofuel; CCUS (carbon capture, utilization and storage) and carbon recycling; energy efficiency; renewables; and natural gas and LNG.

The joint statements are considered to reflect areas of cooperation that are of particular

**Table 1: Key outcomes of each AZEC meeting**

Meeting	Date and location	Key outcomes	No. of MoUs
<b>1st Ministerial</b>	Mar. 2023, Japan	<ul style="list-style-type: none"> <li>• AZEC officially launched</li> <li>• Joint statement with three concepts:                             <ol style="list-style-type: none"> <li>(1) Carbon neutrality/net-zero while ensuring energy security</li> <li>(2) Energy transition while achieving economic growth</li> <li>(3) Various and practical pathways toward carbon neutrality/net-zero</li> </ol> </li> </ul>	28
<b>1st Leaders'</b>	Dec. 2023, Japan	<ul style="list-style-type: none"> <li>• Formalized "one goal, various pathways" and "triple breakthrough" as AZEC principles</li> <li>• Invited ERIA to set up Asia Zero Emission Center to conduct information sharing and policy research, and develop roadmaps for AZEC partners</li> <li>• Launched AZEC Advocacy Group by ASEAN Business Advisory Council (ASEAN-BAC), Japan Business Federation (Keidanren) and ERIA</li> <li>• Released AZEC Progress Report 2023</li> </ul>	68
<b>2nd Ministerial</b>	Aug. 2024, Indonesia	<ul style="list-style-type: none"> <li>• Established Asia Zero Emission Center in ERIA</li> <li>• Launched AZEC sectoral initiatives (Zero Emission Power, Sustainable Fuel Markets, and Next-Generation Industry)</li> </ul>	68
<b>2nd Leaders'</b>	Oct. 2024, Laos	<ul style="list-style-type: none"> <li>• Adopted Action Plan for Next Decade with three pillars:                             <ol style="list-style-type: none"> <li>(1) Advancing "AZEC solutions"</li> <li>(2) Promoting AZEC sectoral initiatives and Asia Zero Emission Center</li> <li>(3) Promoting projects led by Japan or Australia</li> </ol> </li> </ul>	121 (incl. 68 MoUs from 2nd Ministerial)

Prepared by Climate Integrate from [AZEC outcome documents](#)

interest to some or many AZEC participating countries. MoUs have been signed for all technology areas mentioned in the joint statements, except for nuclear energy. While several joint statements include references to nuclear energy, no MoUs related to it have been signed to date. Given that MoUs have been signed for all technology areas except nuclear energy, participating countries including Japan, appear to have an interest in potentially incorporating nuclear energy into future cooperation.

**Table 2: Technology areas referenced in AZEC joint statements**

Technology area	1st Ministerial	1st Leaders'	2nd Ministerial	2nd Leaders'	MoU
Hydrogen and ammonia	✓	✓	✓	✓	✓
Bioenergy and biofuel	✓	✓	✓	✓	✓
CCUS and carbon recycling	✓	✓	✓	✓	✓
Energy efficiency	✓	✓	✓	✓	✓
Renewables	✓	✓	✓	✓	✓
Natural gas and LNG	(✓)	✓	✓	✓	✓
Nuclear energy		✓	✓	✓	
e-fuel and e-methane		✓	✓	✓	✓
Zero and low-emission vehicles		✓	✓	✓	✓
Grid reinforcement and flexibility		✓	✓	✓	✓
Thermal power	(✓)		✓	✓	✓
Hydropower and hybrid dams	(✓)		✓	✓	✓
Solar (perovskite)	(✓)	✓		✓	✓
Wind (offshore)	(✓)	✓		✓	✓
Waste-to-energy			✓	✓	✓
Carbon neutral ports			✓	✓	✓
Sustainable aviation fuel (SAF)		✓		✓	✓
Heat pumps		✓		✓	✓
Geothermal	(✓)			✓	✓
Agriculture and forestry				✓	✓
<b>Total</b>	<b>5 (11)</b>	<b>14</b>	<b>14</b>	<b>20</b>	

\* For the first ministerial meeting, technology areas indicated with parentheses are mentioned only in the Chair's summary (not the joint statement).

\* Technology areas for the second ministerial meeting and second leaders' meeting also include items referenced in attachments to the respective joint statements.

Prepared by Climate Integrate from [AZEC outcome documents](#)

## 1-4 International initiatives

To date, AZEC joint statements have mentioned a total of 26 initiatives led by either Japan or Australia (Table 3), indicating both countries' strong interest in the ASEAN region. Among these, five AZEC initiatives, as well as others such as the JCM, Asia CCUS Network, and AJTP, have clearly defined roles in the AZEC joint statements. However, the roles of many other initiatives within AZEC and their relationships with AZEC remain unclear.

## 1-5 Key players

### (1) Japanese government organizations

Japanese government organizations play key roles in AZEC, by providing various forms of support for Japanese companies as well as companies and public agencies of partner countries.<sup>13</sup>

- Support for Japanese companies
  - Financial support (incl. loans, guarantees, and insurance) by JBIC and NEXI
  - Technical assistance (incl. subsidies for capacity building) by AOTS
  - Funding support for feasibility studies (F/S) and demonstration by NEDO
  - Advice and business environment analysis by JETRO
- Support for companies/public agencies of AZEC partner countries
  - Loans and investments by JBIC
  - Official Development Assistance (ODA) (loans and capacity building) by JICA
  - Capacity building on energy policy by ECCJ/IEEJ
  - Joint research by JOGMEC

\*Full names of Japanese government organizations:

**AOTS** (Association for Overseas Technical Cooperation and Sustainable Partnerships)

**ECCJ** (Energy Conservation Center, Japan)

**IEEJ** (Institute of Energy Economics, Japan)

**JBIC** (Japan Bank for International Cooperation)

**JETRO** (Japan External Trade Organization)

**JICA** (Japan International Cooperation Agency)

**JOGMEC** (Japan Organization for Metals and Energy Security)

**NEDO** (New Energy and Industrial Technology Development Organization)

**NEXI** (Nippon Export and Investment Insurance)

13 ERIA and secretariat of AZEC "[AZEC Progress Report 2023](#)" December 18, 2023 (p.35–58)



**Table 3: International initiatives mentioned in AZEC joint statements**

	Initiative	Start year	Mentioned in joint statement			
			1st M	1st L	2nd M	2nd L
AZEC	<a href="#">Asia Zero Emission Center</a>	2024		○	○	○
	<a href="#">AZEC Zero Emission Power Initiative</a>				○	○
	<a href="#">AZEC Sustainable Fuel Initiative</a>				○	○
	<a href="#">AZEC Next-Generation Industry Initiative</a>				○	○
	AZEC Advocacy Group	2023		○	○	
Other multi-lateral initiatives led by Japan	Asia GX Consortium	2024				○
	ASEAN-Japan MIDORI Cooperation Plan	2023				○
	Strategic Program for ASEAN Climate and Environment (SPACE)	2023				○
	Asia Energy Transition Initiative (AETI)	2021		○	○	○
	<a href="#">Asia Green Growth Partnership Ministerial Meeting (AGGPM)</a>	2021		○	○	
	Asia Transition Finance Study Group (ATF SG)	2021		○	○	○
	Asia CCUS Network	2021				○
	<a href="#">Clean Energy Future Initiative for ASEAN (CEFIA)</a>	2019		○	○	○
	ASEAN-Japan Smart Cities Network High Level Meeting	2019				○
	<a href="#">ASEAN-Japan Transport Partnership (AJTP)</a>	2003				○
Bilateral initiatives with Japan	AZEC Japan-Philippines High-Level Coordination Dialogue	2024			○	
	AZEC Japan-Indonesia Joint Task Force	2023		○	○	
	AZEC/GX Promotion Working Team in Vietnam	2023		○	○	
	Working Group on Cooperation between the Ministry of Energy (Thailand) and METI	?			○	
	<a href="#">Joint Crediting Mechanism (JCM)</a>	2011		○	○	○
Australia-led initiatives	Southeast Asia Investment Financing Facility	2024				○
	Climate and Clean Energy Window under the Southeast Asia and Australia Government-to-Government Partnerships Program	2024				○
	Quad Clean Energy Supply Chain Diversification Program	2023				○
	IPEF Hydrogen Supply Chain Initiative	2023				○
	Aus4ASEAN Futures Initiative	2022				○
	Partnerships for Infrastructure (P4I)	2021				○
Total			0	9	14	20

Prepared by Climate Integrate from [AZEC joint statements](#)

### Box 1: ERIA and Asia Zero Emission Center

The Economic Research Institute for ASEAN and East Asia (ERIA) is an international organization founded in 2008 in Jakarta, Indonesia.<sup>14</sup> It was initially proposed in 2006 by Japan's then Minister of Economy, Trade and Industry, Toshihiro Nikai, who pledged over 10 billion yen (USD 86 million)<sup>15</sup> in funding over 10 years to ERIA.<sup>16</sup> It serves as a think tank for ASEAN and East Asia and conducts research to support economic integration and sustainable development in the region. It currently has 16 member countries.<sup>17</sup>

Since its establishment, the President of ERIA has been appointed from METI. Thus, ERIA holds an important position in AZEC under the leadership of Japan. It has published materials related to AZEC such as the AZEC Progress Report 2023 (Box 2 (p.22)),<sup>18</sup> and inaugurated the AZEC Advocacy Group with ASEAN-BAC and Keidanren in 2023.<sup>19</sup> ERIA also hosts the Asia Zero Emission Center, established in August 2024.<sup>20</sup>

The Asia Zero Emission Center focuses on three research pillars: decarbonization roadmap, sector specific actions (power, mobility, and industry) and market enablers.<sup>21</sup> While renewables are considered an important technology area in sector-specific actions, it is not included in the current research programs (see table below). Moreover, ERIA aims not only to engage in individual projects but also to be involved in the development of decarbonization roadmaps and carbon markets, influencing the policies of AZEC partner countries.

### Research programs of the Asia Zero Emission Center

Decarbonization roadmap		• Decarbonization roadmap development	
Sector specific actions	Power	• Power grid	• Hydrogen and ammonia • Biofuel/Biomass
	Mobility	• Future mobility	• Natural gas
	Industry	• Energy efficient equipment	• CCUS/Carbon recycling • Critical minerals
Market enablers		• Green/Transition finance • Carbon market	

Prepared by Climate Integrate from [ERIA's report \(p.22\)](#)

14 ERIA [website](#)

15 Exchange rate in 2006: 1 USD = 116.3 yen (OECD "[Exchange rates](#)")

16 ERIA [website](#)

17 ERIA "[Annual Report 2024](#)" 2025.6.16 (p.4)

18 Ibid [footnote 13](#)

19 ERIA [Press release](#) August 20, 2024

20 ERIA "[Asia Zero Emission Center](#)"

21 ERIA "[Realising Asia Zero Emission Community](#)" August 21, 2024 (p.22)

## (2) Economic organizations

At the first AZEC Leaders' Meeting, the ASEAN Business Advisory Council (ASEAN-BAC), Keidanren, and ERIA jointly launched the AZEC Advocacy Group to promote the formation of tangible projects in AZEC partner countries.<sup>22</sup> At the second Ministerial Meeting (August 2024), the group submitted a recommendation emphasizing the importance of leveraging technologies like low carbon hydrogen and ammonia, and CCUS along with energy efficiency and power grid development.<sup>23</sup> Prior to the meeting, Keidanren also released its recommendation for advancing AZEC, presenting its expectations and recommending policy coordination and the establishment of a process to promote tangible projects under the platform.<sup>24</sup>

## (3) Parliamentary Association of AZEC

In December 2024, the Parliamentary Association of AZEC was established under the Japanese Liberal Democratic Party to further promote the platform. The association is chaired by Ken Saito, former minister of METI, with former prime minister Kishida, serving as its Supreme Advisor. In May 2025, Kishida visited Indonesia and Malaysia to strengthen diplomatic ties and advance AZEC cooperation.<sup>25</sup>

## 1-6 Funding

Publicly available information on AZEC's funding sources is limited, with only fragmented information currently being disclosed. The available information is as follows:

- AZEC outcome documents show that funding for one of its initiatives (Asia Zero Emission Center) was provided by the governments of Japan and Australia.<sup>26,27</sup>
- 18 AZEC-related projects supported by the Japanese subsidy program (Subsidy for global south future-oriented co-creation project) were presented at the second AZEC Ministerial Meeting.<sup>28</sup> These consist of 7 large-scale demonstration projects and 11 feasibility studies, covering technology areas such as hydrogen and ammonia, sus-

<sup>22</sup> Keidanren [website](#) December 16, 2023

<sup>23</sup> AZEC "[Joint Recommendation by AZEC Advocacy Group Round Table](#)" August 2024

<sup>24</sup> Keidanren [website](#) July 16, 2024

<sup>25</sup> MOFA [website](#) May 6, 2025

<sup>26</sup> AZEC "[Terms of Reference of the "Asia Zero Emission Center"](#)" August 21, 2024

<sup>27</sup> Ibid [footnote 10](#)

<sup>28</sup> AZEC "[List of the AZEC related Projects in the Global South Future-Oriented Co-Creation Project in Japan](#)" August 21, 2024

tainable aviation fuel (SAF), energy efficiency, and renewables.

- METI budget documents in FY2023-FY2025 list six AZEC-related projects, totaling 324 billion yen (USD 2.1 billion).<sup>29,30,31,32,33,34</sup> However, it is unclear how much of this total is directly allocated to AZEC (Table 4).

**Table 4: METI's AZEC-related programs (FY2023–FY2025)**

Program title	Year	Budget amount
Global south future-oriented co-creation project	2023–2024	290 bil yen (USD 1.9 bil)
Project to support strengthening relations with resource-rich countries to secure resource rights and stable supply	2024–2025	11.1 bil yen (USD 73 mil)
Asia's fair energy (decarbonization) transition acceleration project	2023–2024	8.3 bil yen (USD 55 mil)
International collaboration project for the development of carbon neutral realization scenarios	2023–2025	6.7 bil yen (USD 44 mil)
International demonstration project of Japanese technologies contributing to decarbonization/energy transition	2023–2025	6.5 bil yen (USD 43 mil)
Contribution to ERIA	2023–2025	1.4 bil yen (USD 9 mil)

\* Exchange rate 1 USD = 151.4 JPY (OECD Development Assistance Committee's official 2024 exchange rate: [website](#)).

\* "Global south future-oriented co-creation project" budget includes debt incurred by the national treasury in multiple fiscal years from FY2024 onward.

Prepared by Climate Integrate from METI documents



29 METI "[Key Points of the FY2022 Supplementary Budget and FY2023 Initial Budget](#)" March 28, 2023 (in Japanese)

30 METI "[Key Points of the FY2023 Supplementary Budget \(PR material\)](#)" December 28, 2023 (in Japanese)

31 METI "[Key Points of the FY2024 Initial Budget \(PR material\)](#)" March 28, 2024 (in Japanese)

32 METI "[Key Points of the FY2023 Supplementary Budget and FY2024 Initial Budget](#)" March 28, 2024 (in Japanese)

33 METI "[Key Points of the FY2024 Supplementary Budget](#)" December 25, 2024 (in Japanese)

34 METI "[Key Points of the FY2025 Initial Budget](#)" March 31, 2025 (in Japanese)



## 02 MoUs under AZEC

We analyzed 217 MoUs announced to date at AZEC leaders' and ministerial meetings, from three perspectives: by country, by cooperation area, and by entity.

### 2-1 By country

In all AZEC MoUs, Japanese public agencies or companies were involved as signatories. Among other partner countries, Indonesia has the highest number of AZEC MoUs (82 MoUs)—40% of all MoUs or more than twice that of any other country—followed by Thailand (30), Vietnam (30), and Malaysia (22) (Figure 3).

While cooperation areas of MoUs vary by country, the most prominent area in Indonesia, Malaysia, Australia, Singapore, and Laos was hydrogen and ammonia. The most prominent areas of the other countries include greenhouse gas (GHG) accounting (Thailand), renewables (Vietnam), and general relationship building (Philippines).

One of the MoUs between Japan and Singapore designates India as the project site for green ammonia production, which indicates that project locations can extend beyond AZEC member countries.

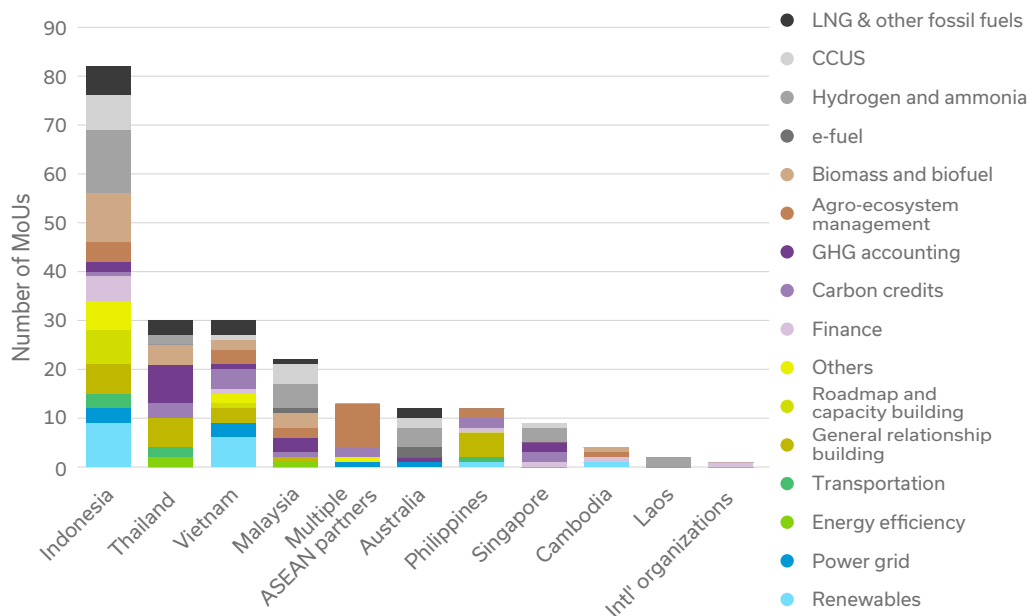
### 2-2 By cooperation area

Among all cooperation areas of AZEC MoUs, the hydrogen and ammonia category is the largest (29), within which a notable portion is designated for use in the thermal power sector (Figure 4).

Other prominent areas include general relationship building, agro-ecosystem management, and biomass and biofuel, followed closely by renewables, GHG accounting, carbon credits, LNG and other fossil fuels, and CCUS. 17 MoUs have been signed on renewable energy, broken down as follows: geothermal (6), solar (6), wind (4), and hydro (1). The category with the fewest MoUs is energy efficiency (3).

Overall, about 30% (67 MoUs) are related to fuels, including hydrogen and ammonia, biomass and biofuels, and LNG.

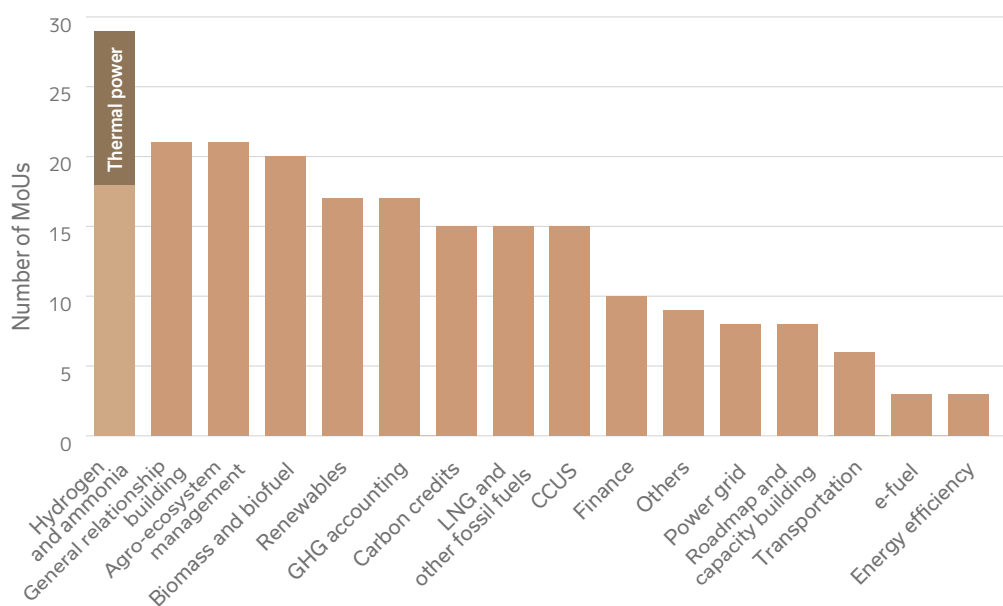
**Figure 3: Number of AZEC MoUs (By country)**



Prepared by Climate Integrate from [AZEC outcome documents](#)



**Figure 4: Number of AZEC MoUs (By cooperation area)**



Prepared by Climate Integrate from [AZEC outcome documents](#)



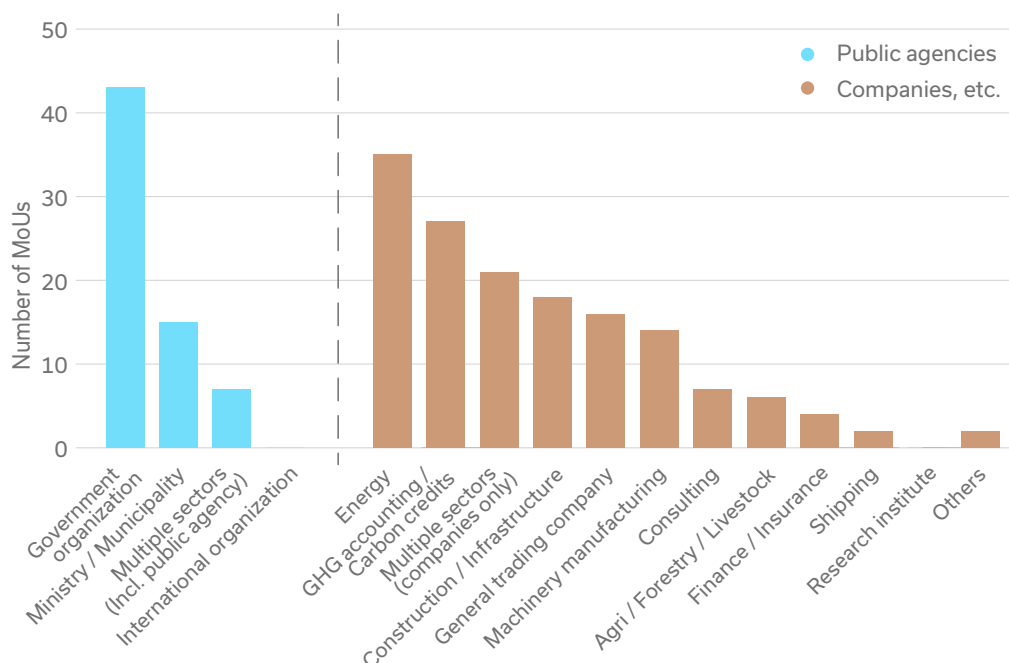
## 2-3 By entity

### (1) Japanese entities

Among the Japanese participants in AZEC MoUs, government organizations (43) account for the highest number within all sectors of entities. More than 10 MoUs were signed by corporate entities in each of the energy (35), GHG accounting / carbon credits (27), construction and infrastructure (18), general trading (16), and machine manufacturing (14) sectors (Figure 5).

MoUs signed by government organizations indicate the roles of each organization in AZEC. Seven MoUs signed by JOGMEC (10) were related to CCUS; six by JBIC (9) were on finding or materializing cooperative projects involving Japanese companies; all by JIRCAS (8) were on agro-ecosystem management; all by NEDO (7) were for strengthening relationships with technology development agencies in partner countries; all by NEXI (5) were on loan insurance in the power or energy sector. This shows that Japanese government organizations are taking the initiative to sign MoUs directly with partner country entities in areas considered to be high business risk for Japanese companies and are supporting the realization of cooperative projects involving Japanese companies, particularly in the power and energy sectors.

**Figure 5: Number of AZEC MoUs by sector of entity (Japan)**



\* "Multiple sectors (incl. public agency)" means that a single MoU was signed jointly by multiple entities in different sectors including a public agency.

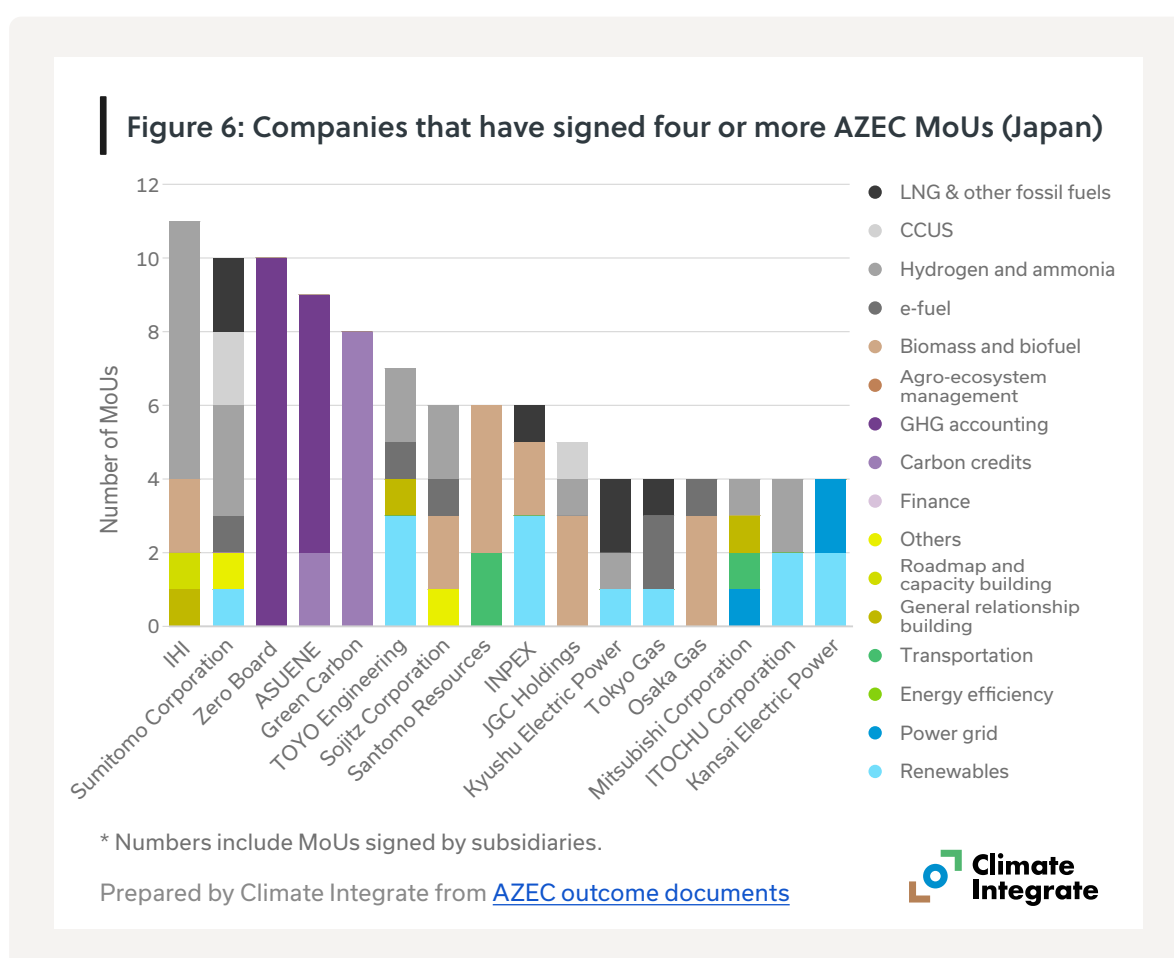
\* "Multiple sectors (companies only)" means that a single MoU was signed jointly by multiple companies in different sectors.

Prepared by Climate Integrate from [AZEC outcome documents](#)

This analysis demonstrates that, under strong government leadership and support, Japanese companies in a wide range of sectors are seeking to expand their business activities through AZEC.

The Japanese company that has signed the most MoUs is IHI, with a total of 11 MoUs. The majority of IHI's MoU projects focus on hydrogen and ammonia. This is followed by Sumitomo Corporation and Zeroboard, each with 10 MoUs (Figure 6).

Other companies with a relatively high number of MoUs include Asuene, Green Carbon, Toyo Engineering, Sojitz, Santomo Resources, INPEX, and JGC Holdings. Their main areas of cooperation include GHG accounting, carbon credits, biomass/biofuels, and renewables.

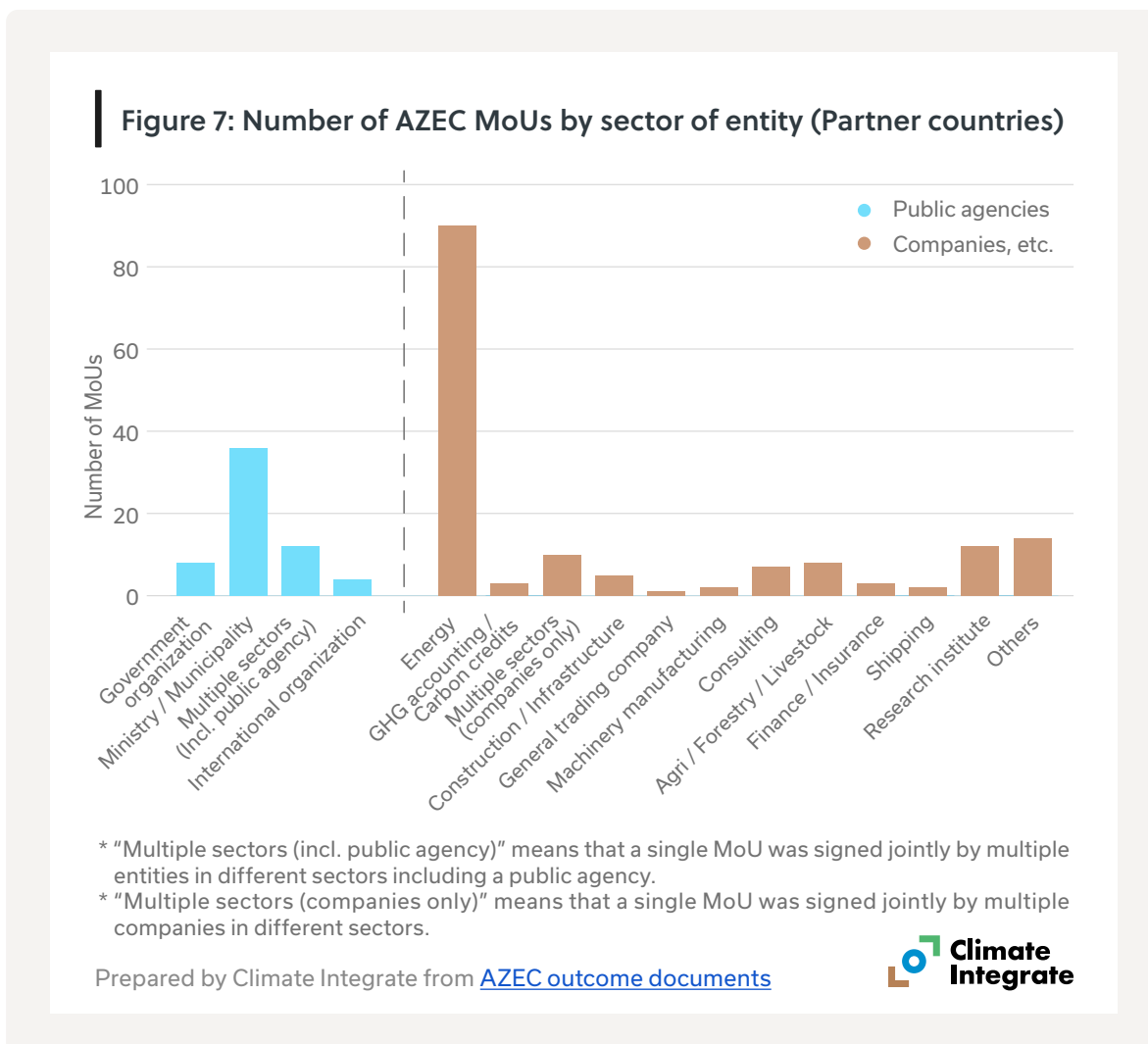


## (2) Partner country entities

Among partner country entities, energy companies stand out, having signed 90 MoUs—41% of the total (Figure 7). This is in contrast to the diverse range of sectors represented by Japanese participants (Figure 5). This is likely due to the fact that many MoUs were related



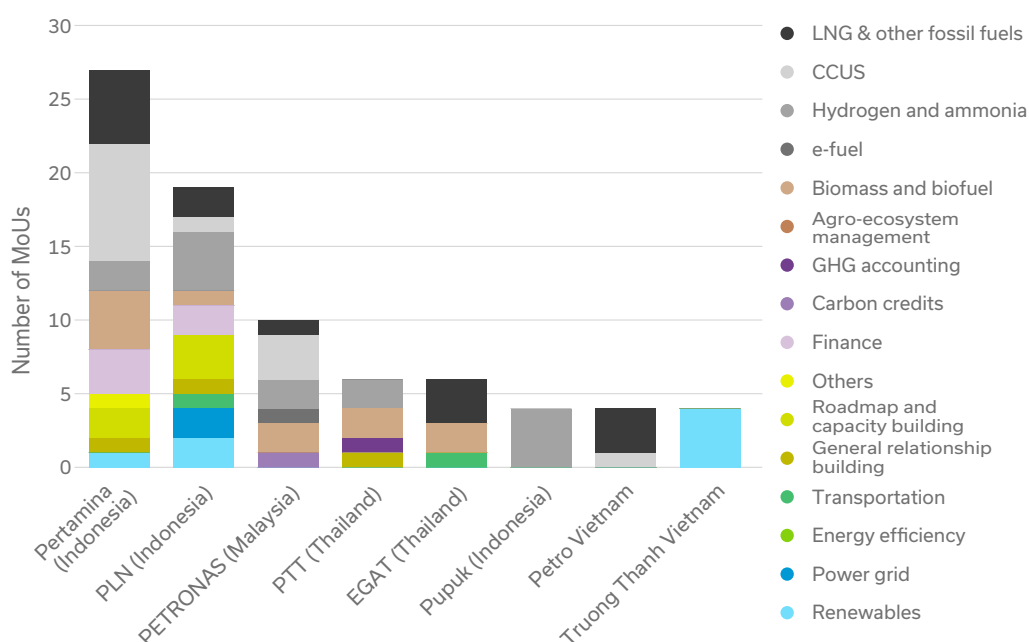
to fuels in partner countries, including fossil fuels, hydrogen and ammonia, biomass, and biofuel. Besides energy companies, ministry /municipality entities (36) and research institutes (12) stand out with more than 10 MoUs each.



Looking at the companies involved from partner countries, five companies—Pertamina (Indonesia), PLN (Indonesia), PETRONAS (Malaysia), PTT (Thailand), and EGAT (Thailand)—account for a large share of the MoUs (Figure 8). This contrasts with the ten Japanese companies that signed five or more MoUs each (Figure 6).

Pertamina stands out with over 27 MoUs, primarily centered on CCUS, LNG and other fossil fuels. PLN and PETRONAS follow, with MoUs spanning diverse areas such as hydrogen and ammonia, CCUS, or roadmap and capacity building. PTT and EGAT are involved in various areas such as biomass and biofuel, LNG and other fossil fuels, and hydrogen and ammonia.

**Figure 8: Companies that have signed four or more AZEC MoUs (Partner countries)**



\* Numbers include MoUs signed by subsidiaries.

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### Box 2: Projects listed in the AZEC Progress Report 2023

The AZEC Progress Report 2023,<sup>35</sup> published by ERIA in December 2023, presented 224 projects (of which 175 are JCM projects) as “projects supported by the Japanese government” in AZEC partner countries. However, these projects represent support provided by the Japanese government to AZEC countries between FY2013 and FY2023 (\*AZEC was launched in March 2023) and are listed separately from AZEC MoUs.

It is unclear how these past support projects relate to the AZEC MoUs. While it is not known whether the list in the report is comprehensive or only a partial selection, the main cooperation areas for these projects are renewables and energy efficiency.

In contrast, the AZEC MoUs analyzed in “[02 MoUs under AZEC](#)” section are in diverse cooperation areas, with the largest share dedicated to hydrogen and ammonia, while share of renewables and energy efficiency is low (Figure 4).

<sup>35</sup> Ibid [footnote 13](#)

## 2-4 Insights from the analysis of AZEC MoUs

- With a strong support by not only government organizations but also the ruling Liberal Democratic Party and Keidanren, AZEC MoUs have been signed by Japanese companies across a wide range of sectors. This indicates a strong interest among Japanese entities in promoting cooperation and business through AZEC.
- By country, Indonesia has signed more than twice as many MoUs as any other partner country. Of these, 35% are related to fuels such as ammonia, hydrogen and LNG, suggesting Japan's particular interest in Indonesia as a resource rich country.
- Across 217 AZEC MoUs, about 30% are related to fuels—including hydrogen and ammonia, biomass and biofuels, and LNG. Among these, a significant portion of the hydrogen and ammonia-related MoUs are to be used in the thermal power sector. This suggests that Japan's primary interests lie in developing supply chains for diverse fuels in AZEC participating countries and in exporting Japanese technologies such as hydrogen and ammonia co-firing in the thermal power sector to partner countries.
- Among the Japanese companies, those in the GHG accounting and carbon credit sector are the second most numerous after energy companies. Many of the MoUs signed by them are focused on generating carbon credits through agro-ecosystem management, GHG accounting in the manufacturing sector, or carbon credit trading. This implies Japan is aiming to acquire carbon credits through agro-ecosystem management in partner countries, while also seeking entry into the GHG accounting and carbon trading business. On the contrary, MoUs related to renewables or energy efficiency account for less than 10% of all MoUs, indicating they are not a high priority.
- Among the partner country companies, energy companies stand out, having signed 41% of all MoUs. Notably, MoUs involving Pertamina and PETRONAS have a large focus on CCUS. This suggests that Japan sees potential in CCUS projects in Indonesia and Malaysia as a means to store CO<sub>2</sub> emissions generated in Japan.

As outlined above, Japan's cooperation under AZEC covers diverse areas, with a central focus on fuels such as hydrogen and ammonia, GHG accounting, carbon credits, and CCUS. In particular, technologies related to fossil fuels or thermal power raise questions about their contribution to emission reduction aligned with the net zero goal and thus require close evaluation of their emission reduction impact and cost-effectiveness.

As Japan plans to expand its support for broader decarbonization efforts in AZEC partner countries—such as by developing decarbonization roadmaps and carbon markets, going beyond individual projects—it will be increasingly important to ensure that such support aligns with emission reduction pathways aligned with 1.5°C goal of the Paris Agreement.

## 03 Looking ahead

This report aimed to answer the question “What’s AZEC?” based on publicly available information. However, information on AZEC related projects and funding sources is limited, making it difficult to fully understand them and assess their current status.

Over recent years, the technology areas and initiatives referenced in joint statements have expanded, suggesting that the scope of AZEC is gradually becoming more vast.

Going forward, as it is led by the Japanese government with public funding, AZEC will need to enhance transparency by tracking and assessing the effectiveness and validity of its projects and initiatives. One approach could be creating a website that lists all MoU projects and initiatives with regular progress updates, accompanied by information on financial support.

To foster a fair and constructive partnerships with AZEC participating countries and to ensure meaningful contributions to decarbonization efforts in Asia through Japan’s efforts towards carbon neutrality, the following points are important:

- Evaluate whether each AZEC project and initiative aligns with the development pathways of partner countries while also aligning to net-zero pathways consistent with 1.5°C goal under the Paris Agreement.
- Prioritize support on cost-effective technologies in emission reduction, such as renewables and energy efficiency.
- Disclose information on financial support for AZEC and the progress of related projects.

### What's AZEC ?

What is the Asia Zero Emission Community?

Climate Integrate | July 2025

Written by: Hiroaki Odawara

Kimiko Hirata

Ragini Sarmah

Yukimi Yamazaki

Layout and design: Yasuyuki Sasaki

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