

Getting *AZEC* right

HOW CAN THE ASIA ZERO EMISSION COMMUNITY HELP ITS MEMBERS MEET RENEWABLE ENERGY OBJECTIVES

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The AZEC initiative, Japan's flagship regional energy diplomacy vehicle, has set out to support the member countries' economic growth, energy security and emission reductions. However, despite many positive elements, the initiative could better prioritise concrete clean power projects, energy efficiency and enabling infrastructure in alignment with the partner countries' energy transition goals.

Analysis of AZEC agreements released in ministerials and summits from 2023 to 2024 shows early progress with AZEC-connected renewables projects in some member countries. However, such projects are still limited – or even absent – other countries.

However, the inclusion of fossil energy projects overshadows AZEC's support for zero-emissions energy solutions. With thoughtful course correction, clean energy projects under AZEC could provide mutual benefits to host countries and Japan alike, and contribute to improved energy security in the region.

Next steps for AZEC

To ensure that financial and other support provided through AZEC can efficiently deliver its objectives, the initiative should:

- ▶ Prioritise support for clean solutions that are demonstrably aligned with countries' energy transition targets and AZEC's emission reductions goals.
- ▶ Continue to develop its institutional structures and practices.
- ▶ Set climate guardrails for the projects its supports.

AZEC: a platform for cooperation towards net zero emissions

The Asia Zero Emission Community (AZEC) initiative has quickly established itself as one of the key frameworks in the Southeast Asia energy diplomacy landscape. Proposed in 2022 by then Prime Minister Kishida of Japan and co-launched with Indonesia, AZEC now includes a total of 11 member countries: two OECD countries (Japan and Australia), and nine ASEAN member countries (Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand and Viet Nam).

Many of the Southeast Asian country members have pressing needs to meet energy demand growth, ensure affordability of energy and improve energy security. The majority are also strongly committed to decarbonisation: six of AZEC's ASEAN countries plan to reach net zero emissions by 2050, and a further two in 2060 and 2065.¹ Half of AZEC's ASEAN country members have signed on to the Global Renewables and Energy Efficiency Pledge² to triple the global capacity of renewable energy; all have goals to increase the role renewables play in their power sectors (Table 1, page 5).

The opportunity for renewables in Southeast Asia is vast, but so too is the scale of transformation. In 2022, renewables supplied around 29% of the region's power generation according to the ASEAN Centre for Energy (ACE); however, with supportive policies, **renewables could expand to make up approximately 90% of the region's power supply by 2050**, according to scenarios by the International Energy Agency (IEA; Announced Policies Scenario), ACE (Carbon Neutrality Scenario), and IRENA and ACE (1.5°C Scenario).³ But the task ahead is pressing: in the next ten years, renewable energy solutions – wind, solar, geothermal and modern bioenergy – will need to expand much faster than the pace seen today simply to keep up with the projected annual 4% growth in electricity demand in the region up to 2035, according to IEA's Stated Policies Scenario.⁴ To help ensure national energy needs and renewables targets are met, initiatives like AZEC must focus on enabling accelerated renewables deployment.

AZEC's climate objectives and energy transition track record so far

AZEC has connected its mission to global climate targets. In the 2024 Leaders' Joint Statement, the *Action Plan for the Next Decade*, the AZEC countries jointly acknowledged the need for emissions reductions in line with 1.5°C pathways and reiterated their commitments to the energy transition objectives set out at COP28, including the global efforts to triple renewable energy capacity and transition away from fossil fuels.⁵

AZEC made an encouraging start in supporting renewable solutions in its first years. Our analysis finds that approximately **9%** of the AZEC agreements in ASEAN-AZEC countries involve promotion of renewable energy projects – solar, wind, geothermal, hydro and sole use of green hydrogen or ammonia – in power generation or captive energy use (Figure 1,

page 6). Another approximately 15% of the agreements relate to other aspects of promoting renewable energy. Within these agreements, our review identified 17 defined renewable power or energy use projects across AZEC countries (Table 1).

However, there are concerns that other aspects of Japan's energy technology promotion through AZEC may be misaligned with its stated climate goals and its members' clean power pathways. For instance, a 2024 report⁶ found that one-third of the AZEC Memoranda of Understanding (MOUs) include promotion of technologies related to fossil fuels; Climate Integrate⁷ found that hydrogen and ammonia are the most common cooperation areas, often involving their use in the power sector alongside fossil fuels. Our analysis identified fossil-fuel-related power and energy projects in five of the ASEAN-AZEC countries: Indonesia, Thailand, Viet Nam, Malaysia, and Singapore. These projects include a range of upstream fuel production, new fossil-based power production, and efforts to reduce emissions from existing fossil power plants – however, there are several risks associated with this strategy (see page 10).

Going forward, AZEC can best ensure its value by focusing on its members' self-determined clean energy priorities with the most growth potential, as well as the grid and storage infrastructure necessary to enable them. Southeast Asian countries' current policies, aggregated in IEA's Stated Policies Scenario, already show an intent to cover most new power capacity additions up to 2035 and 2050 by solar, wind and hydro. Replacing fossil fuels even faster, in alignment with the countries' announced climate goals, would cut the region's fossil fuel import bill to one-third of what is expected under current policies, and significantly improve energy security.⁸ To ensure AZEC's activities are consistent with these goals, **various steps to strengthen its support to clean solutions are needed.**

The support offer – financing and confidence-building through AZEC

Meeting the Southeast Asian countries' climate and energy transition objectives will require annual clean energy investments to rise to \$190 billion in 2035, nearly six times the current level.⁹ AZEC could play an important role in bridging this gap; however, limited information disclosure so far has made its funding offer difficult to assess.¹⁰

The AZEC initiative is closely tied to Japan's activities on transition finance in Asia.¹¹ Though the expected scale of this finance remains unclear, the channels for AZEC financing will be familiar to partner countries. According to Japan's Ministry of Economy, Trade and Industry (METI), financing for AZEC will be channelled through its public institutions including JBIC, NEDO, NEXI, JICA, JETRO and JOGMEC* – suggesting various types of support will be available, including export finance and insurance, development assistance, and support for pilots and innovations.¹² In addition, carbon credits are mentioned as a funding

* Japan Bank for International Cooperation, New Energy and Industrial Technology Development Organization, Nippon Export and Investment Insurance, Japan International Cooperation Agency, Japan External Trade Organisation and Japan Organization for Metals and Energy Security.

mechanism in several of the agreements analysed. Going forward, more transparency is needed about the funding, its terms, and how potential project partners can access it.

In addition to direct financial support, getting named as an AZEC project can bring about other benefits, for example by increasing investor confidence and accelerating important business and financial decisions.¹³

AZEC structures and core activities

During AZEC's first couple of years of operation, institutional structures and practices have been set up, including annual meetings and more regularly convening working groups. For an overview of AZEC's institutional structures, see the Annex.

AZEC encourages cooperation among its members by promoting high-level activities such as relationship building between relevant stakeholders, policy formulation and dialogues, roadmap creation and research cooperation. The initiative strongly emphasises sector-specific initiatives, including power, industry, transport and fuel value chains, along with lesser focus on agriculture and forestry.

At its core, AZEC has a strong emphasis on promoting tangible projects involving Japanese companies. Information about these projects, alongside the more high-level cooperations, has been published as MOUs or other agreements on METI's website. To date, the website lists 280 agreements in total,¹⁴ though removal of duplicates brings the number to just under 220.¹⁵ METI's other AZEC materials talk about over 350 cooperation projects, indicating the AZEC MOUs only capture part of Japan's initiatives in the region.¹⁶

Renewable energy projects under AZEC

Our analysis of AZEC projects focuses mainly on the approximately 190 bilateral MOUs between Japan and ASEAN-AZEC countries signed in 2023 and 2024. Multi-country and other multilateral agreements have not been analysed at this stage. In the Indonesia case study on page 7, we offer a more detailed analysis of the power and energy use projects found in the AZEC MOUs signed between Japan and Indonesia. The 12 MOUs between Japan and Australia are analysed on page 12.

Table 1 offers an overview of ASEAN-AZEC countries' national renewable energy objectives and the concrete renewable energy projects identified in the MOUs. For Indonesia, we also included upcoming projects described as being related to AZEC in media articles and official statements. In addition to power projects, we have included examples of captive renewable energy use. Renewable-energy-related fuel supply agreements are excluded given uncertainties about their end-use purposes. For example, while use cases in hard-to-abate sectors may positively contribute to decarbonisation, co-firing in the power sector is a problematic strategy.

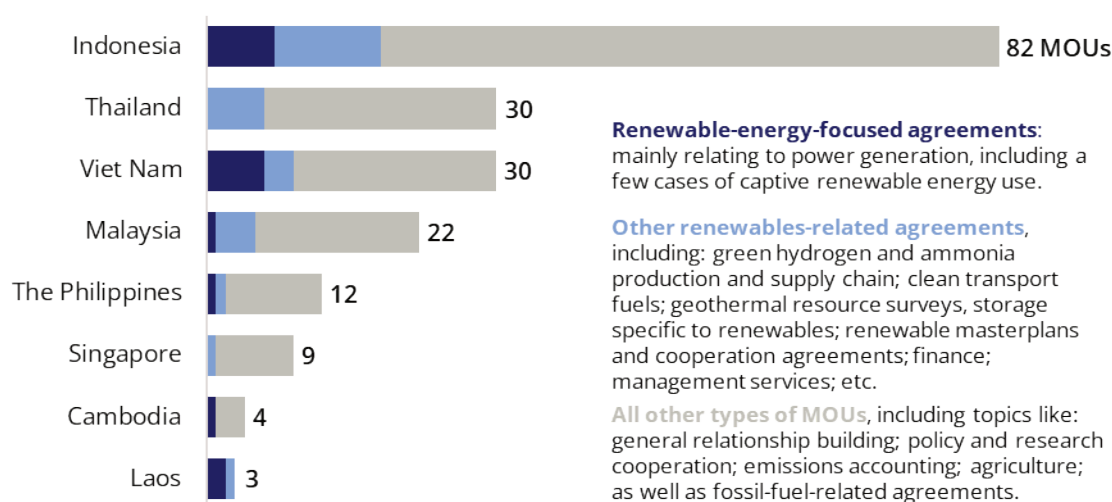
Table 1: Renewable energy projects between Japan and ASEAN-AZEC countries identified in bilateral MOUs and other sources.

Country	National renewable energy objectives	Renewables-focused AZEC projects
Indonesia	Increase the share of RE to 35% of the total power mix by 2034 . Over the next ten years, 60% of new capacity from utility will come from RE, led by solar and hydro, followed by geothermal and wind. ¹⁷	2 solar projects 3 geothermal projects 1 hydro project in scoping phase 2 industrial park renewables projects
Thailand ✓	Increase the share of RE to 51% of the power mix by 2037 , led by solar. ¹⁸	No concrete renewable power projects, but RE mentioned as potential future solution in several MOUs.
Viet Nam	Increase solar capacity to 46–73 GW , on- and nearshore wind to 26–38 GW , offshore wind by 6 GW , by 2030 . ¹⁹	2 near- and offshore wind projects 1 solar sharing project 1 industrial park project including solar and biomass power among others
Malaysia ✓	Increase RE to 40% of installed capacity mix in 2040 , and further to 70% in 2050 . ²⁰	1 green hydrogen mono-firing demonstration project
The Philippines ✓	Increase RE to 35% of the power mix by 2030 , and 50% in 2040 . ²¹	1 onshore wind project
Singapore ✓	Increase solar to 2 GW-peak by 2030 . Import 6GW low-carbon electricity, mostly from renewables to cover one-third of power supply, from the region by 2035 . ²²	No concrete renewable power projects.
Cambodia	Increase RE to 72% , or conditionally up to 80% of the installed capacity mix by 2035 , with focus on solar and wind. ²³	1 solar project
Laos	Increase hydropower to 13GW by 2030 , and conditional on assistance, increase solar and wind by 1GW , and biomass energy by 300 MW by 2030 . ²⁴	1 floating solar project for electricity export 1 green hydrogen project to replace fossil fuel power in coffee roasting
Brunei Darussalam ✓	Increase RE to 30% of the installed capacity mix by 2035 . Expand solar capacity to 200 MW by 2025 . ²⁵	None; no country-specific MOUs yet

✓ signifies countries that have signed the Global Renewables and Energy Efficiency Pledge.²⁶

Source: E3G analysis from multiple sources, including METI's AZEC publications, and ASEAN Center for Energy, February 2025, [ASEAN Energy in 2025](#).

Breakdown of AZEC MOUs per country



Source: E3G analysis of AZEC MOUs published in AZEC ministerials and summits in 2023 and 2024. No MOUs with Brunei were included in the analysed MOU lists.

Figure 1: A minority of AZEC agreements between Japan and ASEAN countries involved renewable energy projects, and their prevalence varies across the countries.

Overall, **9% of the AZEC agreements in ASEAN-AZEC countries involve promotion of renewable energy projects** – solar, wind, geothermal, hydro and sole use of green hydrogen or ammonia – in power generation or captive energy use. A further approximately 15% of the agreements relate to other aspects of promoting renewable energy, such as resource surveys and alternative fuel supply chains, or cooperation on roadmaps and financing. Projects specific to biomass combustion have not been included.

Figure 1 shows there is some variation in how strongly renewables feature in each member country. Based on the AZEC agreement lists from 2023 and 2024, three countries – Thailand, Singapore and Brunei Darussalam – were still without renewable power projects. Meanwhile, in Laos, all agreements are related to renewable energy. Indonesia (eight projects) and Viet Nam (four projects) have the largest number of renewables projects in absolute terms (see Table 1).

To some extent, the variety in the types of projects reflects national differences. For example, AZEC's first wind projects are located in the countries with the best offshore wind potential: Viet Nam and the Philippines.²⁷ The concentration of geothermal projects in Indonesia reflects its large geothermal resources. Meanwhile, although solar potential is strong across the region, solar-specific projects are found in just four countries so far: Indonesia, Viet Nam, Cambodia and Laos. However, additional projects may be under way through agreements that mention renewable energy as a future solution without specifying a source of energy, or upcoming new agreements.

Given the limited amount of information the published MOU lists provide, as well as the projects often being in early phases, it is not always certain that projects will progress into concrete investments.

Case study: AZEC in Indonesia

Indonesia hosts by far the largest number of AZEC projects: 40% of the agreements being between Japan and Indonesia. This reflects its status as the region's largest economy with the largest energy demand,²⁸ as well as Japan's ongoing prioritisation of Indonesia as the main target country in Asia for its bilateral public financing in the energy sector.²⁹

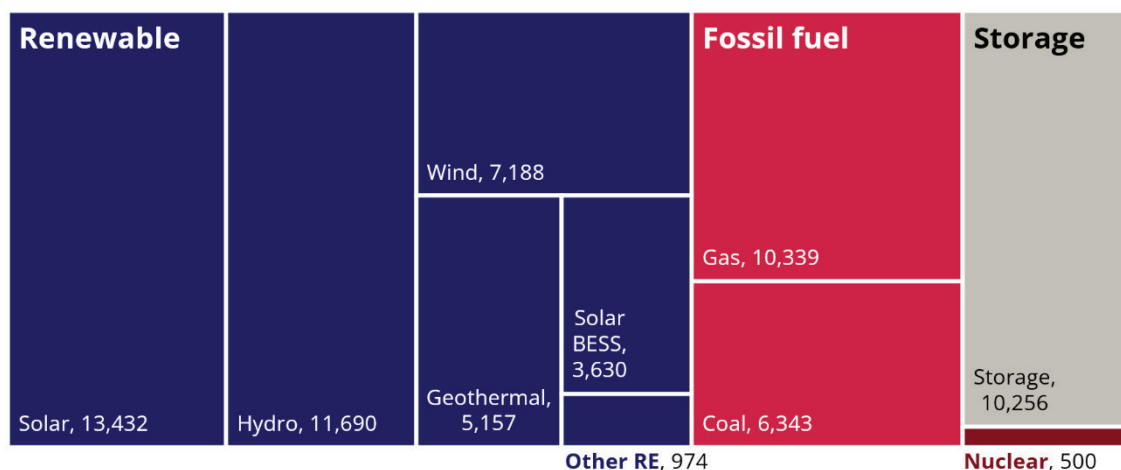
Indonesia has played an important role in the initiative since its beginning. AZEC's launch was jointly announced by Japan and Indonesia on the sidelines of Indonesia's G20 Summit in Bali,³⁰ and it was the first country after Japan to host an AZEC ministerial in 2024.

Indonesia is also well ahead in creating and supporting institutional structures for AZEC. The Indonesian Coordinating Minister for Economic Affairs (CMEA) has established the Asia Zero Emission Community Indonesia Taskforce, aiming to materialise MOUs and their implementation.³¹ As a bilateral effort, Japan and Indonesia have set up a Joint Task Force in Indonesia, with participation from Indonesian ministries, national electricity utility (PLN) and other companies, as well as Japan's ambassador to Indonesia, METI, JBIC, along with other relevant ministries and companies. In addition, Indonesia hosts the Asia Zero Emission Center in Jakarta.

Indonesia has a goal to reach net zero emissions by 2060. President Prabowo has also announced an ambitious goal to phase out fossil fuels and achieve a fully renewables-based power sector by 2040.³² While the current power development plan does not yet fully correspond to these statements, it continues to target large-scale renewable energy deployment, aiming for a 35% renewable energy share in the power mix by 2034.³³

With this target in place, the PLN 2025 plan envisions around 60% of new power capacity to come from renewables within the next ten years (Figure 2), indicating \$83.9 billion in private investment. AZEC is well positioned to help bridge the financing gap in Indonesia's renewables agenda and upgrade technical capacity to increase renewables uptake. During AZEC's launch, Japan made an initial commitment to extend support of \$500 million to Indonesia for implementing energy transition program, and to expand cooperation to facilitate public-private decarbonisation initiatives.³⁴

Planned additional power generation capacity in Indonesia, 2025–2034 (MW)



Source: Ministry of Energy and Mineral Resources (MEMR), PT PLN, May 2025, [2025–2034 Electricity Supply Business Plan \(RUPTL\)](#)

Figure 2: Around 60% of Indonesia’s planned new generation capacity to 2034 is renewables-based.

It is important to note that AZEC activities in Indonesia do not represent all of Japan’s decarbonisation-related engagements with the country. According to the Netral Karbon Jakarta Japan Club and the JETRO Jakarta Office, as per February 2025, around 698 projects or initiatives are underway or in planning to support Indonesia’s decarbonisation agenda.³⁵

AZEC cooperation in Indonesia: positive start with renewable projects, but risky approaches with fossil fuel technologies

Within the approximately 80 AZEC MOUs with Indonesia so far, we found that approximately one-fifth of the projects had to do with proceeding or planned projects in power and energy use. Adding upcoming projects reported in the media to this list, we identified 17 projects that focus on developing new power generation, repurposing existing power facilities, and industrial energy projects (Table 2).

Concerningly, seven of the 17 power and energy use projects are related to fossil fuel technologies. Eight projects focus on renewable energy, while two projects involve waste-to-energy. However, regardless of the energy source, many of these projects are still in early stages, and it is not certain if all of them will be realised.

Agreements other than power and energy use are not included in the following table, but we discuss them briefly towards the end of this section.

Table 2: AZEC projects in Indonesia relating to new power generation, repurposing power facilities, and industrial energy.

Type of projects	Project information				
	Energy source / technology	Named project / facility	Capacity	Stage	Notes
Fossil-fuel related projects	Coal and ammonia co-firing	Labuan CFPP	600 MW	Planning and Development	Study done, investment starts in 2025
	Coal and biomass co-firing	Paiton CFPP	800 MW	Planning and Development	6% blend-rate implemented, aiming for 30% to 100%
	Thermal power CCS	Paiton CFPP	800 MW	Preliminary Study or Feasibility Study	Cooperation is subject to PLN NP's assets
	Gas and hydrogen or ammonia co-firing	Muara Karang Gas Power	2,129 MW	Preliminary Study or Feasibility Study	—
	Coal to gas conversion	N/A	N/A	Preliminary Study or Feasibility Study	—
	New gas power plant	N/A	N/A	Preliminary Study or Feasibility Study	—
	Coal and ammonia co-firing, ammonia mono-firing	Gresik CFPP	200 MW	Preliminary Study or Feasibility Study	Completed co-firing trial to unit 1 (100 MW) in 2022
Renewable energy projects	Geothermal	Sarulla II	260 MW	Early Exploration	Plan to expand existing plants
	Geothermal	Patuha II (2)	55 MW	Financial Close/EPC	Planned Commercial Operation Date (COD) in 2026
	Geothermal	Muara Laboh II	140 MW	Financial Close/EPC	Planned COD in 2028 and 2033
	Solar (housing)	N/A	N/A	Early Exploration	Non-utility scale projects. Joint venture has been developed
	Solar and battery	Universitas Hasanuddin	N/A	Operation	Non-utility scale projects for EV Charging Station
	Solar, biomass, and BESS	Nunukan Hybrid	11.4 MW	Early Exploration	Industrial Park
	Unspecified renewable power, biogas, solar	GIIC industrial park Deltamas City	100 MWp (Solar)	Preliminary Study or Feasibility Study (Solar)	Industrial Park
	Hydro power	Kayan	9,000 MW	Early Exploration	Stated in the national strategic project. Environmental permit finalised in 2015 with no updates
Other Projects	Waste-to-energy	Legok Nangka	18/40 MW	Early Exploration	Construction of the landfill ongoing
	Waste-to-energy	Bekarpur	N/A	Early Exploration	—

Source: E3G analysis based on various sources. Projects were identified in AZEC MOUs, except for Sarulla and Kayan which were identified in media articles. The stages of the projects were determined based on assessment of official government documents: PLN's Procurement Plan (RUPTL), National Hydrogen and Ammonia Roadmap, Annual Government Reports, etc.



It is concerning that the **number of projects related to fossil power and nascent emissions reduction technologies, such as co-firing projects, is quite large**. Although most of these projects aim to reduce emissions from existing power plants, reflecting both countries' interest in pursuing abatement technologies in the power sector, their implementation may present several risks to the achievement of decarbonisation targets.

1. High retrofitting and operational cost clash with the low-cost energy objectives.

Nascent emissions reduction technologies like CCS and co-firing remain highly costly. Indonesia's vertically integrated electricity market is subject to government regulation, particularly when electricity procurement costs increase. Numerous analyses warn that ammonia co-firing and CCS come with high Levelised Cost of Energy (LCOE), and are likely to remain more expensive than renewables, which continue to show a downward cost trend.³⁶ It is also important to consider the economic burden on Indonesia, as hydrogen and ammonia co-firing³⁷ and CCS require significant subsidies. This means these projects may face approval challenges or regulatory barriers, leading to delays or stagnation. One way to cover the high costs is by extending the operational lifetime of existing fossil fuel power assets, which raises concerns about the impact on absolute emissions reductions.

2. Emissions reductions may be limited. There is concern that fuel conversions and co-firing retrofits in existing power plants could lengthen their operational lifetimes, without delivering sufficient emissions reductions. For instance, in 2025, AZEC supported an ammonia co-firing trial at the Labuan coal plant in Indonesia. The trial, with a 3% green ammonia co-firing rate over 8 hours, indicated an insignificant annual reduction of approximately 70,640 tons of CO₂. This reduction is low compared to the plant's estimated total annual emissions of 3–4 million tons of CO₂ at a capacity factor of 60–80%.³⁸ Other issues contributing to the risk of limited emissions reductions have been explored in detail in other publications.³⁹

3. Limited contribution to energy security. Technologies such as co-firing and gas conversion may create new dependencies, especially on feedstock availability, which could undermine long-term energy security. In the case of gas, future supply and price outlook remain unsettled, and Southeast Asian countries have struggled with price volatility and supply challenges as LNG shipments have been diverted to other markets.⁴⁰ This supply concern also influenced Indonesia's 2025 decision to reduce the role of gas power in its future plans.⁴¹ Alternative fuels like clean hydrogen and ammonia could play a role in improving energy security and decarbonisation in the long term in countries like Indonesia that have the potential to produce them. However, many analyses suggest these fuels are more needed in sectors like industry, chemicals, and long-distance or heavy-duty transportation. This is expected to be the case in Indonesia as well.⁴² As such, prioritising the use of limited clean hydrogen and ammonia resources strategically will be important.

Looking at the renewable power projects, the picture is mixed, and there is room for much greater ambition. There is a notable gap between Indonesia's plans to increase renewable capacity through utility scale **solar** power deployment (13.4GW in current plans), and the plans in AZEC agreements constituting just two small-scale solar-specific projects, and two where solar is included in industrial park projects. The room for growth is huge, as solar holds by far the largest potential among renewable energy sources in Indonesia.⁴³ This potential becomes even more substantial when considering the President's ambition to install 100 GW of solar power.⁴⁴

On the other hand, several agreements to develop **geothermal** projects seem promising; in addition to the three projects further along in development, several were found to be in earlier survey phases. As development of next-generation geothermal is an interest area for Japan, this can provide an opportunity for mutual benefits. Going forward, it is important to ensure these and other projects, including hydropower and waste-to-energy, are conducted with appropriate transparency and consideration for social and environmental concerns.

Beyond the power sector projects, we found just under one-third of the projects in Indonesia focus on upstream energy projects and the fuel supply chain. These are most commonly biomass and biofuel projects, but also include LNG production, ammonia projects, and geothermal resource surveys. In many cases it is not clear yet what end-use sector these projects will end up serving.

Aside from power and upstream energy projects, other positive cooperations include the several agreements focusing on greenhouse gas visualisation and accounting, which can help identify investment opportunities for emissions reduction solutions in the future. There are also a few agreements focused on grid, transmission and battery storage, and building on these would benefit the growth of clean solutions.

Going forward, AZEC should strengthen the scalability of renewables in Indonesia, rather than focusing on emissions reduction projects tied to existing fossil fuel power plants, which are neither a priority in Indonesia's electricity planning nor aligned with its long-term strategies. Moreover, such projects risk contributing to a deeper lock-in of fossil fuel dependence in Indonesia's economy.

Prioritising renewables aligns with the views of Indonesian business leaders. A poll exploring corporate leaders' sentiments found 88% wanting to shift the country's electricity mix towards renewables and away from coal and other fossil fuels by 2035.⁴⁵

Recommendations

The AZEC projects and investments should be realigned with Indonesia's emissions reduction and energy transition targets, particularly making renewable energy capacity additions the main priority. Specifically, future AZEC cooperations should put stronger

emphasis on supporting Indonesia's priority objective to add significant solar capacity, as well as its storage and grid financing needs.

Japan and Indonesia could also establish climate guardrails to avoid emissions lock-in from fossil-fuel-related projects (see recommendations on this topic on page 16). In addition, it is important to strengthen coordination between AZEC and other initiatives related to power sector decarbonisation in Indonesia, such as the Just Energy Transition Partnership (JETP) and other multilateral energy transition programmes, to ensure strategic alignment.

Country snapshot: AZEC & Australia

As an OECD nation in AZEC alongside Japan, **Australia is well positioned to support the other member countries and play a role in co-defining the direction of the initiative**, in alignment with its aim of becoming a regional renewable energy superpower. In the 2024 document *Action Plan for the Next Decade* approved by AZEC leaders, a section on Australia-led projects highlights the financial contributions Australia has made to initiatives in the region, including through the Southeast Asia Investment Financing Facility, Aus4ASEAN Futures Initiative, Southeast Asia and Australia Government-to-Government Partnerships Program, and the Partnerships for Infrastructure (P4I), among others. The P4I for example has a strong focus on supporting renewable energy deployment in the region.⁴⁶

Australia also has bilateral AZEC-labelled projects with Japan, with a dozen MOUs and cooperations released so far (Figure 3). Several focus on clean fuel development, whether in the form of hydrogen, ammonia, e-fuel or sustainable aviation fuel, utilising Australia's rich renewable energy sources. A grid project to increase the connection capacity between mainland Australia and Tasmania will also support the country's energy transition. However, Australia's agreements also include cooperation on fossil gas, and in the case of some hydrogen and ammonia projects, the feedstock is not specified, making their emissions footprint unclear. Two projects that aim to transport CO₂ captured in Japan for storage in Australia are also likely to raise critical questions.

Recommendations

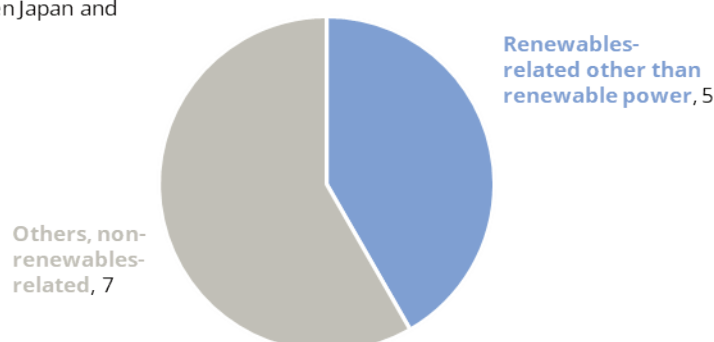
Australia should actively engage with AZEC to ensure it is structured to support its own and members' clean energy and emissions reduction ambitions. It should aim to ensure the direction and activities of AZEC are aligned with its regional strategies and international climate commitments, such as the clean energy collaboration priorities set out in Australia's Southeast Asia Economic Strategy to 2040⁴⁷ and the Clean Energy Transition Partnership⁴⁸ on transitioning international public support from the unabated fossil fuel energy sector to the clean energy transition.

Going forward, the solutions highlighted in Australia's forward-looking Future Made in Australia plan are expected to contribute to regional partners' decarbonisation as well; these include battery and solar manufacturing, renewable hydrogen and green metals.⁴⁹ Australia can use AZEC as an additional avenue to promote these solutions regionally.

Australia could also share its experiences of integrating independent science-based climate expertise into decision making with AZEC countries and encourage them to consider setting up or strengthening existing similar structures.[†]

Renewables in AZEC MOUs between Japan and Australia

There are currently no **renewable-power-focused agreements** between Japan and Australia.



Source: E3G analysis of AZEC MOUs published in AZEC ministerials and summits in 2023 and 2024.

Figure 3: 12 agreements between Australia and Japan have been released so far, several of which focus on clean fuel development.

Clean opportunities and mutual benefits

Encouraging economic growth is one of the key principles of AZEC alongside promoting emissions reductions and energy security. Efforts toward this objective are likely to be successful when they focus on matching solutions that its supporters have leadership and industrial interests in with those of their partner countries' needs.

A key area that would benefit from more focus under AZEC is **energy efficiency** and efforts to optimise energy consumption, especially considering the regional projected 4% annual growth of power demand discussed in the introduction. A particularly urgent issue is minimising emissions from **cooling**, which accounts for almost one-third of Southeast

[†] Among AZEC's current members, Australia and the Philippines are two countries with national, independent climate councils that are members of the [International Climate Councils Network](#).

Asia's growth in electricity use.⁵⁰ In addition to tackling this through policy shaping, regulation improvements and best practice sharing, Japan has a lot to offer in terms of efficient air conditioner technology, some of which uses artificial intelligence to optimise usage while cutting electricity use.⁵¹ Also, given the increasing power needs of the data centre industry, Japan could promote joint approaches to developing data centre efficiency standards, an issue it is currently working on nationally.

A positive example among ongoing AZEC activities is AZEC SAVE, an energy efficiency programme that is a partnerships between Japan and Thailand.⁵² Creating specialised programmes on efficiency with other member countries would help identify the most urgent needs and opportunities for energy efficiency investments in each country.

Another area AZEC could lean into more strongly are the opportunities in **grid investments**, which is an area ASEAN constantly emphasises as a focus, and where Japanese companies have competitive strengths. Japan has already indicated it is interested in supporting this field more in the future.⁵³

On the energy supply side, **geothermal** offers a particular opportunity with mutual benefits for both Japan and ASEAN-AZEC countries. While smaller in scale than solar and wind in terms of expected generation capacity, geothermal can provide a critical function in the power system as dispatchable power. Because of this, the IEA has recommended that governments support de-risking geothermal investments in Southeast Asia.⁵⁴ As Japan is also keen to develop its geothermal industry and is already supporting geothermal projects with Indonesia, this is an area AZEC could expand on.

Across Southeast Asia, **solar** is the most rapidly expanding power generation technology, and makes up the largest share of new power capacity additions in current plans.⁵⁵ To support its partner countries in this priority and to make the most of the investment opportunity, AZEC can support finding export opportunities for Japan's existing solar panel manufacturers and help facilitate pilot projects for emerging solar panel types, including perovskite panels and high-performance technologies.⁵⁶ Japan could also share its insights in circular manufacturing and recycling of used panels. Agrivoltaics is another interesting opportunity for many AZEC countries.

Developing its capabilities in the offshore **wind** industry is also an important priority for Japan domestically, one it has approached through cooperation with international partners. Leveraging these relationships, as well as Japan's own strengths in maritime industries, AZEC can build on the ongoing wind cooperation with Viet Nam and the Philippines. In addition to these countries, Thailand and Cambodia also possess good onshore wind resources that AZEC could help utilise.⁵⁷

Japan can also offer solutions for **decarbonisation in the transport sector**, building on its success in exporting electrified busses and commercial vehicles in the region⁵⁸ and its experience in supporting various countries in the region with public transport projects.

Conclusions and recommendations

The need for collaboration and support to realise a clean energy transition in Southeast Asia is clear. Japan and Australia's readiness to contribute to ASEAN-AZEC countries' efforts to improve energy security, reduce emissions and support economic growth is sure to be welcomed.

AZEC has made an encouraging start at fostering agreements that promote positive solutions, including concrete renewable energy projects, energy storage, grid improvements and greenhouse gas accounting systems, as well as climate-smart agriculture. These are areas AZEC can confidently build upon.

However, AZEC's first years have also caused concerns. The notable inclusion of fossil-fuel-related projects risks overshadowing the support for renewables and related solutions. Though the intention is often to bring about emissions reductions from existing power plants, these technologies come with many risks, including to economic and energy security.

To ensure AZEC efficiently supports its member countries' clean energy transition objectives and energy security needs while meeting its stated 1.5°C and zero emissions goals, the involved countries could consider the following recommendations.

Sectoral priorities

- ▶ **Prioritise support for clean solutions that are demonstrably aligned** with member countries' energy transition targets and AZEC's collective commitment to emissions reductions in line with 1.5°C pathways and tripling renewables capacity by 2030.
- ▶ **Build on positive early progress with projects focused on enabling infrastructure and services**, for example by accelerating cooperation on grid, transmission and storage solutions, as well as greenhouse gas accounting.
- ▶ **Provide support to advance the development of the ASEAN Power Grid** as jointly prioritised by ASEAN member countries.
- ▶ **Build on energy efficiency initiatives**, for example by replicating the AZEC SAVE programme in more partner countries, and promoting projects that utilise efficient technologies, for example in cooling. Promote joint approaches to developing data centre efficiency standards.
- ▶ **Expand AZEC's support for renewable energy solutions**, focusing especially on solar and wind as the solutions with highest expansion potential, supported with geothermal to provide flexibility.

Strengthening institutional structures and governance

- ▶ **Strengthen AZEC's institutional resourcing dedicated to renewables**, for example by establishing a renewable energy focused programme within existing AZEC-related institutions.
- ▶ **Develop coordination with other energy transition initiatives**. In countries where other international support programmes like Just Transition Partnerships are active, stakeholders should aim to ensure strategic alignment and efficient implementation.
- ▶ **Establish practices for independent external review**. To ensure efficient governance as AZEC's institutional structures and activities develop, consider establishing systems that involve experts from wide range of member countries, to provide expert review and advice on a range of issues, such as governance, reporting, assessing delivery of activities towards the initiative's objectives, and climate and sustainability assessment.
- ▶ **Improve transparency**. Develop clear and publicly accessible communications about the financing, agreements and projects being pursued under AZEC to enhance monitoring, assessing progress and supporting efficient implementation.
- ▶ **Access & inclusive participation**. Clarify how interested stakeholders can offer cooperation and solutions and access the support and opportunities offered by AZEC. Provide opportunities for actors beyond public institutions and corporations, such as civil society organisations, academia and independent experts to participate in discussing the initiative's direction.

Climate guardrails

- ▶ **Develop and clarify the criteria that projects must meet to be included in AZEC and receive public financial support**. These criteria should align with Japan and Australia's commitments towards phasing out fossil fuel finance through the G7, the Clean Energy Transition Partnership of which Australia is a member, and agreements or guidelines such as the OECD agreements. To protect the credibility of the initiative, fossil fuel projects without a demonstrable and clearly communicated pathway to alignment with the participating countries' emissions reduction targets, AZEC's stated climate objectives and the Paris Agreement should be excluded.
- ▶ **Establish climate guardrails for fossil-fuel-related projects**. Any already announced projects involving gas, LNG, or co-firing alternative fuels with fossil fuels, including emissions abatement in such facilities, should demonstrate alignment with emissions reduction pathways and meet robust climate requirements. These could include: sunset dates for the envisioned investments in cases of both new and existing facilities; requiring clarity on emissions implications of the alternative fuels throughout their supply chain; and whether these power plants will be used for baseload operation or to provide flexible generation.

Annex: AZEC structures and decision making

While the AZEC initiative does not have a formal decision making structure, it has established certain institutional frames through which it operates, including:

- ▶ **Annual Leaders' and Energy Ministers' meetings** set out high-level direction, currently organised side-by-side with ASEAN Summit and Ministerials
- ▶ **AZEC Leading Action Forum (AZEC LEAF)** convenes working-level officials to discuss policies, challenges and steps to realise AZEC initiatives.⁵⁹
- ▶ **Country-specific working groups** in Indonesia, Viet Nam, Thailand and the Philippines focus on policy discussions, project promotion, with participation of the partner country and Japanese ministries, private sector, and Japan's diplomatic mission in the country.
- ▶ **The Asia Zero Emission Center** serves as a knowledge hub and platform for policy dialogues; the Center operates in Jakarta, Indonesia

In Japan, the government has set up an AZEC Promotion Council under the cabinet, showing the importance placed on the initiative. Japan's public financial institutions also have specific structures for AZEC, such as the AZEC/GX Task Group within Japan Bank for International Cooperation (JBIC).⁶⁰ The Asia GX Consortium focuses on issues around transition finance for Asia, including through AZEC.⁶¹

Outside these institutions, groups that influence AZEC decision making include the AZEC parliamentarians' group within Japan's governing Liberal Democratic Party, as well as the AZEC Advocacy Group consisting of Japan's business association Keidanren and the ASEAN Business Advisory Council. In addition, a Japanese think tank, the Institute of Energy Economics, Japan (IEEJ) has participated in organising some of AZEC's activities.⁶²

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