

## Accelerating Decarbonization in Southeast Asia: Commercial and Industrial Sector Captive Coal Fired Power Plants are the Low-Hanging Fruit Too Many are Ignoring

Key words: Energy Transition, Transition Finance, Coal, Renewable Energy, Captive Power, Energy Efficiency, Southeast Asia, Fossil Fuels, Climate Change

Co-authors: Kanchuya Sukdheva, Senior Advisor, and Farzana Hoque, Senior Advisor

Captive power plants play a significant role in the electricity sector of many emerging and developing economies, which rely on small to mid-sized installations for industrial processes or captive power. To date, the Asia-Pacific region hosts the largest captive power market globally<sup>1</sup> and, according to Global Energy Monitor, captive power plants are “a major driver of new coal plants worldwide,” including in some parts of Asia.<sup>2</sup> While some companies have begun to integrate renewable energy into their captive energy systems, this has not yet achieved widespread adoption within the region, particularly for coal-dependent heat related processes.

This paper aims to inform stakeholders within the energy transition ecosystem, with a particular focus on local banks, about opportunities in Asia’s commercial and industrial (C&I) energy transition. **The key takeaway is that while technological innovations, global trade requirements and other international forces are catalyzing C&I captive power energy transition in Asia, this is yet to scale due to the need for more financing support.**

### What is “Captive Power”?

“Captive power” in the context of energy refers to the generation of power to produce electricity, heating, cooling, and steaming by an entity or a facility for its own consumption, rather than relying solely on the main grid for power supply. It involves the production of power for on-site use, typically by commercial and industrial sector establishments, rather than being supplied by an external utility.

<sup>1</sup> Mordor Intelligence, “Captive Power Plant Market Size & Share Analysis - Growth Trends & Forecasts (2024 - 2029), accessed March 12, 2024, <https://www.mordorintelligence.com/industry-reports/captive-power-plant-market/market-size>.

<sup>2</sup> Energy Monitor, “Weekly data: how captive coal plants are driving global coal growth,” November 21, 2023, <https://www.energymonitor.ai/policy/market-design/weekly-data-how-captive-coal-plants-are-driving-global-coal-growth/?cf-view>.

This approach provides these companies with greater control over their energy supply, helps ensure a reliable power source, and may offer potential cost savings, especially in regions where grid reliability or energy costs are concerns. Captive power systems can use a variety of energy sources, including fossil fuels, renewable energy, or a hybrid combination of different technologies.

## Captive Power in Asia: An Untapped Opportunity

Asia-Pacific accounts for the largest captive power market globally,<sup>3</sup> driven by rapid industrialization, development of commercial projects in emerging and developing economies, and its role as a manufacturing hub, especially for key industrial metals (e.g., steel, nickel, aluminum, and copper), cement, chemicals, textiles, and paper industries.

China had the largest captive power generation market in the region in 2021.<sup>4</sup> However, China has aimed to curb the construction of new captive coal plants citing their failure to meet the latest efficiency and emissions standards and their exemption from the standard government fees imposed on public coal plants operated by power generation companies.<sup>5</sup>



On the other hand, India's captive power generation market stands out as the most rapidly expanding market in the Asia-Pacific region.<sup>6</sup> The country's installed capacity of captive power plants has grown substantially from 588 MW in 1950 to 78,508 MW in 2021 and continues to expand.<sup>7</sup> The metals and minerals segment is the largest consumer of captive power generation in India. A shift toward renewable energy is the primary trend shaping India's market growth,<sup>8</sup> and renewables now comprise approximately 6-8% of total captive capacity.<sup>9</sup>

In Southeast Asia, aggregate national-level information about the captive power market is scarce, except for Indonesia, which stands out due to its significant and expanding market. Indonesia comprises a major share of the captive power market with 22,746 MW of capacity, with around 60% of this capacity generated by coal-fired power plants (CFPPs).<sup>10</sup> See Figures 1 and 2. The growth of new captive coal plants globally is largely attributed to Indonesia,

---

<sup>3</sup> Mordor Intelligence, "Captive Power Plant Market Size & Share Analysis - Growth Trends & Forecasts (2024 - 2029), accessed February 5, 2024, <https://www.mordorintelligence.com/industry-reports/captive-power-plant-market/market-size>.

<sup>4</sup> KBV Research, "Asia Pacific Captive Power Generation Market Size," accessed February 22, 2024, <https://www.kbvresearch.com/asia-pacific-captive-power-generation-market/>

<sup>5</sup> Global Energy Monitor, "Weekly data: how captive coal plants are driving global coal growth," November 21, 2023, <https://www.energymonitor.ai/policy/market-design/weekly-data-how-captive-coal-plants-are-driving-global-coal-growth/>.

<sup>6</sup> Market Research Future, "India's captive power generation market stands out as the most rapidly expanding market in the Asia-Pacific region" (2024), <https://www.marketresearchfuture.com/reports/captive-power-generation-market-10446>.

<sup>7</sup> Sarthak Law, "Captive Power Generation in India and its Inherent Challenges," accessed February 22, 2024, <https://www.sarthaklaw.com/captive-power-generation-in-india-and-its-inherent-challenges/>.

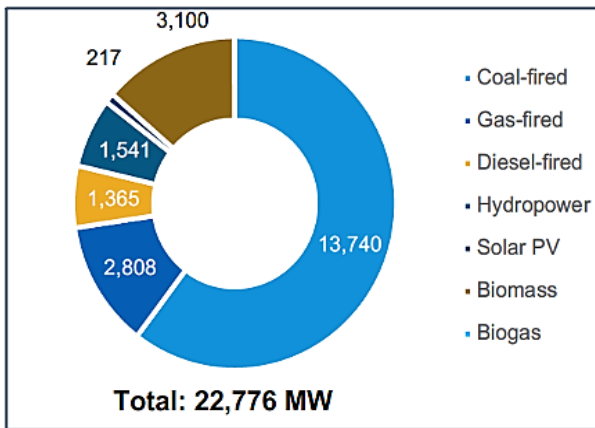
<sup>8</sup> Technavio, "India Captive Power Generation Market by End-user and Fuel Type and Ownership - Forecast and Analysis 2024-2028" (2024), <https://www.technavio.com/report/captive-power-generation-market-industry-in-india-analysis>

<sup>9</sup> Argus Media, "India to have 500GW of renewables before 2030: Minister," September 26, 2023, <https://www.argusmedia.com/en/news-and-insights/latest-market-news/2492927-india-to-have-500gw-of-renewables-before-2030-minister>.

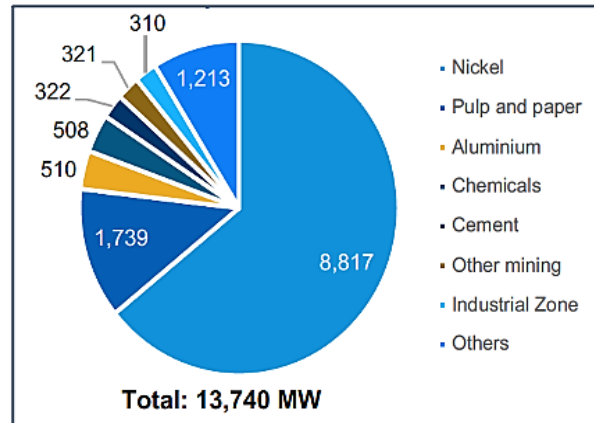
<sup>10</sup> Asian Development Bank, "Accelerating the Clean Energy Transition in Southeast Asia," July 2023, [https://www.adb.org/sites/default/files/project-documents/55124/55124-001-tacr-en\\_0.pdf](https://www.adb.org/sites/default/files/project-documents/55124/55124-001-tacr-en_0.pdf).

where 30 new plants are currently under construction.<sup>11</sup> The nickel sector ranks as the largest consumer of captive power generation.

**Figure 1: Indonesia’s Captive Power by Type**



**Figure 2: Indonesia’s Captive Coal Consumption In the C&I Sector**



Source: Asian Development Bank

From our analysis and current engagement with other countries in Southeast Asia – Thailand, the Philippines, and Vietnam, we have found that these markets also have opportunities for captive power decarbonization and energy transition. Sector opportunities include, but are not limited to – iron and steel, cement, pulp and paper, food and beverage, seafood processing, packaging, and textiles and garments. Heating and cooling utilize over 50% of power consumption in the captive power market. Captive C&I power consumption is of concern and an important area to address because it has mostly relied on inefficiently sized coal-fired power plants (CFPPs) or expensive diesel power plants.

Based on our conversations with captive power asset owners, challenges to be addressed before operationalizing asset-level energy transitions can be categorized into policy, technology, and financial considerations. For example, government and regulatory policies on coal phase down, renewable energy generation, and other environmental and social regulations are not set in stone and are subject to change. From a technology view, the lower capacities (>2 MW) of units may make deployment of transition technologies more difficult than in larger scale utilities.<sup>12</sup> On the financial side, the limited participation of local banks financing energy transition projects for C&I companies, particularly those that are in hard to abate sectors, is one of the challenges.

Acknowledging these challenges, trends from the national to global level are still shifting the momentum towards C&I captive power energy transition. In the following sections, we discuss the technology innovations available, international forces catalyzing the transition, the role of local bank participation in this sector, as well as alternative sources of capital available.

### Technology Innovations: The Solutions Are Already Available

Technology considerations and options for C&I decarbonization and energy transition include energy efficiency, hybridization, grid integration and microgrids, onsite demand management, and renewable energy technologies. A

<sup>11</sup> Global Energy Monitor, “Weekly data: how captive coal plants are driving global coal growth,” November 21, 2023, <https://www.energymonitor.ai/policy/market-design/weekly-data-how-captive-coal-plants-are-driving-global-coal-growth/>.

<sup>12</sup> Information based on Climate Smart Ventures analysis and stakeholder discussions.

preliminary analysis of existing renewable technologies being adopted in the C&I sector suggests that most optimal solutions are achieved through integration of renewable energy into thermal power generation and heating based industrial processes. These hybridization solutions are already available and used in real applications globally and in Southeast Asia. Moreover, companies have found hybridization and transition to be commercially feasible and profitable. With increasing costs of power from on-grid applications, particularly for locations far from urban city centers, hybridization will be essential to manage cost of production. Actual case studies are listed below:

- Thailand-based Siam Cement Group (SCG) has transitioned from being coal/thermal captive power reliant to using solar energy, biomass, refuse-derived fuel (RDF) technology, and waste heat recovery power generation (WHRPG). This has resulted in the company achieving alternative fuel use at 40% and greenhouse gas (GHG) emissions reduction of 12.1% from 2020.
- Cement company Semen Indonesia Group (SIG) used a similar approach as SCG, transitioning from being coal/thermal captive power reliant to using solar energy, biomass, RDF technology, and WHRPG. Using these strategies, SIG achieved a 16.7% carbon intensity reduction, 69% clinker factor reduction, and 7.2% thermal substitution rate.
- TPI Polene Power (TPIPP) is a 70% subsidiary of TPI Polene Public Company Limited (TPIPL), Thailand's third largest cement manufacturer. TPIPP has power purchase agreements (PPAs) with TPIPL as the offtaker. Initially, TPIPP only sold energy from CFPPs to TPIPL. The transition strategy involved modifying and expanding the power plants selling power to TPIPL. TPIPP converted 220 MW CFPPs to municipal solid waste power plants, and it also built a new 40 MW waste heat recovery power plant. A subsequent agreement between the two entities involves TPIPL selling waste heat from cement production processes to TPIPP, while TPIPP sells generated power to TPIPL. TPIPL's current capacity of 440 MW is at 65% renewables and it uses 25% waste fuel instead of coal in cement production. It also treats municipal solid waste and has monetized waste heat.

Diverse technology innovations are available, but a technical analysis is required to assess feasibility on a case by case basis. Nonetheless, our analysis of energy transition in C&I sectors beyond cement, including iron and steel, textiles and garments, pulp and paper, and food and beverage, have also shown successful use of clean technologies to reduce carbon emissions and improve environmental impact.

## **National to Global Forces Catalyzing C&I Energy Transition**

Recent developments from the national to global levels are also creating new motivations for C&I captive power energy transition. Here are a few of the drivers.

### **1. Governmental Policy and Regulations**

Nationally Determined Contributions, net zero commitments, and country-level regulations to reduce sector-specific GHG emissions are broadly incentivizing the public and private sector to transition to renewable energy technologies. Indonesia's and Vietnam's Just Energy Transition Partnership (JETP) commitments and India's Renewable Generation Obligation for coal and other thermal plants are examples of national-level initiatives aiming to encourage decarbonization. It is worth noting that while the Indonesian government has opted to exclude captive coal plants from its JETP investment plan, it will instead conduct a study and roadmap for decarbonizing its captive power systems. Each country in the region approaches regulation of captive power plants differently, warranting regular attention to this aspect.



## 2. Global Trade Requirements

Companies in the C&I sector will in many cases need to reduce emissions in response to global trade requirements, such as the EU's Carbon Border Adjustment Mechanism (CBAM). With CBAM, importers in the EU will need to address their Scope 3 emissions resulting from suppliers' operations. During CBAM's current transition phase, which began in October 2023 and lasts through December 2025, exporters must submit emissions reports to their importing partners, including the embedded emissions of their goods. CBAM will be fully implemented in 2026, when EU importers will be required to purchase certificates reflecting the domestic carbon price, for specific goods based on their embedded GHG emissions.<sup>13</sup>

## 3. Sustainable Supply Chain Commitments

The C&I sector is also influenced by the sustainability commitments of multinational corporations (MNCs), particularly in the textile, garment, and consumer goods sectors, that are also seeking to address their Scope 3 emissions. MNCs such as Adidas, H&M, and Unilever have committed to emissions reductions targets in line with the Science Based Target initiative (SBTi) as well as to sourcing goods from developing countries.<sup>14</sup> This provides impetus for C&I suppliers to adjust their operations to align with the sustainable supply chain commitments of MNCs.



## 4. Demand for Renewable Energy Certificates (RECs)

In Southeast Asia, demand for Renewable Energy Certificates (RECs) has seen significant growth due to the demand of corporate electricity consumers seeking to meet their renewable energy targets.<sup>15</sup> Issued by independent third-party organizations, RECs are tradeable, market-based instruments that create a financial incentive for energy producers to generate renewable energy. RECs represent "proof that 1 megawatt-hour (MWh) of electricity was generated from a renewable energy source and added to the grid."<sup>16</sup> Energy producers that have earned an REC can sell it to another party to generate revenue, but in this process, they give up the right to make claims to the renewable energy they generated for that certificate.<sup>17</sup>

## 5. Market Leader Trends in Captive Power Decarbonization

The C&I sector in Southeast Asia can benefit from lessons learned from other market leaders engaged in captive power decarbonization. For example, automotive companies including Tesla, Tata, and BYD have invested in solar power generation systems in addition to their EV manufacturing plants, while tech giants like Facebook, Google, and Amazon are investing in captive power for data centers to lower their overall levelized cost of electricity.

<sup>13</sup> Earth.org, "The Implications of the EU Carbon Border Adjustment Mechanism on the Environment and Global Trade," August 4, 2023, <https://earth.org/the-implications-of-the-eu-carbon-border-adjustment-mechanism-and-for-the-environment-and-global-trade/>.

<sup>14</sup> Note: In March 2024, SBTi dropped the net zero commitments of 239 companies, including Unilever. All three companies mentioned here (Adidas, H&M, and Unilever) have near term targets maintained with SBTi. Learn more here: <https://sciencebasedtargets.org/companies-taking-action#what-is-the-difference-between-near-term-long-term-and-net-zero-targets>.

<sup>15</sup> Asia Pacific Energy Research Centre (APERC), "Renewable Energy Certificates (RECs) in Six APEC Southeast Asia Economies," July 2023, [https://aperc.or.jp/file/2023/7/19/Renewable\\_Energy\\_Certificates-RECs-in\\_Six\\_APEC\\_Southeast\\_Asia\\_Economies.pdf](https://aperc.or.jp/file/2023/7/19/Renewable_Energy_Certificates-RECs-in_Six_APEC_Southeast_Asia_Economies.pdf).

<sup>16</sup> STACS, "Powering Sustainability: Renewable Energy Certificates (RECs) in Driving Asia's Clean Energy Transition," accessed February 5, 2024, <https://stacs.io/guide-to-renewable-energy-certificates/>.

<sup>17</sup> US Environmental Protection Agency, "Renewable Energy Certificate Monetization," accessed February 5, 2024, <https://www.epa.gov/greenpower/renewable-energy-certificate-monetization>.

## Local Banks: From the Sidelines to Center Stage

Some Southeast Asian C&I companies have pursued energy transition initiatives over the past 10-15 years to minimize their cost of capital, but they often labeled these activities as cost and energy efficiency exercises, not as energy transition.<sup>18</sup> Similarly, a number of local banks in Southeast Asia state that they fund energy efficiency and/or renewable energy projects as part of sustainable finance programs, but they usually don't use the term "transition finance" or reference "energy transition."

The following are a few examples, and more can be found at the end of this report in the Appendix: Local Bank Financing and Services for Energy Transition-Related Projects:

- Bank Rakyat Indonesia's sustainable financing covers energy efficiency, renewable energy, eco-efficient production technologies and processes.
- VietCombank finances renewable energy, green energy, and environmental protection projects.
- Bangkok Bank provides loans for the production and transmission of electricity from renewable energy sources such as solar power plants, wind power plants and hydropower plants. It also provides loans for energy conservation and loans linked to sustainability performance.

Additionally, some banks state that such financing is for small and medium enterprises (SMEs) or only for green and sustainable companies. In these cases, banks should expand their scope to provide financing for energy efficiency and renewable energy projects for larger commercial and industrial companies, including those that are hard-to-abate such as steel and aluminum and with captive power systems.

On the other hand, a few local banks are taking the lead and explicitly addressing energy transition and transition finance, such as the following in Figure 3.

**Figure 3: Examples of Local Banks with Transition Finance Initiatives**

BDO Unibank - Banco de Oro	<p>BDO Unibank, based in the Philippines, funds renewable energy projects and provides energy efficiency financing as part of its sustainable finance program. BDO also established a 2022 Energy Transition Finance Statement, available <a href="#">here</a>, describing its energy transition financing policies.</p> <p>It states: "BDO will support its customers' transition to reduced carbon emissions by providing access to capital so they may invest in innovative technologies that will lessen their greenhouse gas emissions, or adapt their business to renewable energy alternatives."</p>
-------------------------------	---

<sup>18</sup> Information based on Climate Smart Ventures staff conversations with companies.

<p>Malayan Banking Berhad (Maybank)</p>	<p>In 2023, Malaysia based Maybank published a comprehensive Transition Finance Framework (TFF), accessible <a href="#">here</a>. Eligible activities for transition finance include energy efficiency, renewable energy, and retrofitting existing facilities for sectors including cement, aluminum, and steel manufacturing.</p> <p>For example, with aluminum manufacturing, eligible activities for transition finance include retrofitting of existing facilities that result in an emissions intensity lower than 4.108 tCO<sub>2</sub>e/t23 through the following measures, including but not limited to: improvement in the thermal efficiency, novel anode technologies, use of renewable energy for smelting, and retrofitting of old smelters. Another category for transition finance is retrofitting of existing CFPPs to allow for: adoption of carbon capture, utilization and/or storage (CCUS) technology, co-firing with ammonia, co-firing with solid biofuels, and co-firing with hydrogen.</p>
<p>BPI - Bank of the Philippine Islands</p>	<p>BPI's Sustainable Development Finance Program's products and services extend to energy efficiency, renewable energy, and green buildings. BPI also established an Energy Transition Financing Facility, for which proceeds have been used to accelerate the decommissioning of a coal power plant and support renewable energy.</p>

At the international level, commercial banks such as DBS, Citi, and HSBC have also established transition finance programs targeted to C&I captive power energy transition.<sup>19</sup> See Figure 4 for details. These could also inform local bank strategy and participation.

**Figure 4: Examples of Global Banks with Transition Finance Initiatives**

<p>DBS</p>	<p>DBS launched the world's first Sustainable and Transition Finance Framework Taxonomy in 2020, accessible <a href="#">here</a>, to help its clients shift to more sustainable business models.</p> <p>The taxonomy outlines the way DBS manages transactions that are classified as “Green”, “Transition” and/or contributing to the United Nations Sustainable Development Goals (UN SDGs). The taxonomy also details the use of proceeds that are eligible for specific industries, including metals and mining, chemicals, food and agribusiness, and apparel, footwear, and textiles.</p>
<p>HSBC</p>	<p>In 2024, HSBC released its inaugural Net Zero Transition Plan, available <a href="#">here</a>, comprising a roadmap for financing and supporting its customers in their energy transitions. One of its focuses is to support existing industries to decarbonize their operations and processes.</p> <p>The plan includes information on sector transitions, such as heavy industry sectors including iron, steel, aluminum, cement, and chemicals. For example, for iron, steel, and aluminum, HSBC states that it supports producers with scaling investment into nascent technologies, such as clean hydrogen and carbon capture and storage.</p>

<sup>19</sup> DBS, “DBS launches world’s first sustainable and transition finance framework and taxonomy to help clients advance on sustainability agenda,” July 9, 2020, [https://www.dbs.com/newsroom/DBS\\_launches\\_worlds\\_first\\_sustainable\\_and\\_transition\\_finance\\_framework\\_and\\_taxonomy\\_to\\_help\\_clients\\_advance\\_on\\_sustainability\\_agenda\\_ID](https://www.dbs.com/newsroom/DBS_launches_worlds_first_sustainable_and_transition_finance_framework_and_taxonomy_to_help_clients_advance_on_sustainability_agenda_ID) and HSBC, “Partnering to scale finance for the transition at COP28,” December 8, 2023, <https://www.hsbc.com/news-and-views/news/hsbc-news-archive/partnering-to-scale-finance-for-the-transition-at-cop-28>.

Citi

One of the key pillars of Citi's Sustainable Progress Strategy is to finance the low-carbon transition. This includes mobilizing capital to support activities in energy efficiency, clean technology, renewable energy, and circular economy, among others.

The bank states that “Transition finance is a solution that banks like Citi are using to help facilitate climate solutions like renewable energy and clean technology. This includes working with clients in some of the highest emitting sectors that can help the global economy to reach net zero emissions.”

Given Asia’s energy transition imperative,<sup>20</sup> the technology innovations already available, and the transnational forces seeking to influence Asia’s C&I carbon footprint, now is the time for local banks to expand their financing scope to include decarbonizing C&I sector companies with captive power systems and to embrace the language of energy transition and transition finance. We encourage banks to broaden their support beyond existing sustainable enterprises and consider extending support to hard-to-abate companies, thus addressing broader sustainability challenges. Moreover, a few global and local banks have already taken the lead in establishing transition finance frameworks, which serve as useful examples for other local banks in establishing their own financing policies.

## Alternative Sources of Capital

In addition to international and local bank financing, other sources of capital applicable for C&I energy transition include blended finance and climate/transition funds. Recent options and mechanisms have emerged, showing promise for further development.

### Multilateral Development Banks and Blended Finance

Examples of blended finance options include Energy Transition Mechanisms (ETMs) and Just Energy Transition Partnerships (JETPs), among others as discussed in this section. The Asian Development Bank (ADB), which pioneered the concept of ETM in 2021, describes it as “an innovative model which [uses] blended finance to accelerate the retirement of coal power plants and develop green, renewable energy to replace it.”<sup>21</sup> ADB’s ETM program is currently active in five countries: Indonesia, the Philippines, Vietnam, Kazakhstan, and Pakistan. In 2022, the ADB signed a Memorandum of Understanding with the government of Indonesia and independent power producer Cirebon Electric power to refinance and prematurely retire a CFPP in Indonesia, Cirebon-1.<sup>22</sup> This was the first agreement under ADB’s ETM. Progress has since been made, with a nonbinding framework agreement signed between the partners in December 2023.<sup>23</sup>

In a separate initiative, the ADB along with Global Energy Alliance for People and Planet (GEAPP) and the Monetary Authority of Singapore (MAS) in 2023 announced their plan to establish a blended finance partnership to support energy transition in Asia. The memorandum of understanding (MOU) signed between the three aims to “to set up an energy transition acceleration finance partnership to mobilize concessional capital from the philanthropic and public sectors, de-risk projects, and crowd-in private capital from around the globe to finance energy transition

<sup>20</sup> Climate Smart Ventures, “Asia’s Energy Transition Imperative: Shifting from Coal to Clean Energy,” accessed March 12, 2024, <https://climatesmartventures.com/asia-et-imperative/>.

<sup>21</sup> World Economic Forum, “Energy Transition Mechanism (ETM) for Southeast Asia: Partnership Launch,” November 3, 2021, <https://intelligence.weforum.org/monitor/latest-knowledge/de61c710b27945f6add9fe1e90f706e8>.

<sup>22</sup> Reuters, “Indonesia, ADB launch first coal power plant retirement deal,” November 14, 2022, <https://www.reuters.com/business/cop/exclusive-indonesia-adb-launch-first-coal-power-plant-retirement-deal-2022-11-14/>.

<sup>23</sup> Asian Development Bank, “New Agreement Aims to Retire Indonesia 660-MW Coal Plant Almost 7 Years Early,” <https://www.adb.org/news/new-agreement-aims-retire-indonesia-660-mw-coal-plant-almost-7-years-early>.



projects in Asia.”<sup>24</sup> Potential projects cited by the partnership include early phaseout of coal assets and replacement with renewable energy, as well as decarbonization projects in hard-to-abate sectors.<sup>25</sup> The partners also stated that this initiative will benefit from ADB’s broader ETM.

In 2021, ADB launched the Climate Innovation and Development Fund (CIDF), which has received \$25 million in philanthropic concessional capital from Bloomberg Philanthropies and Goldman Sachs. The CIDF has unlocked \$500 million in private sector and government investments for clean energy transition projects in South and Southeast Asia.<sup>26</sup>

The International Finance Corporation (IFC) is also supporting the energy transition in Southeast Asia. In January 2024, the IFC announced that it is investing USD 15 million in the Southeast Asia Clean Energy Fund II (SEACEF II).<sup>27</sup> Investments will target projects in Indonesia, Vietnam, and the Philippines, and companies with a regional footprint across Southeast Asia. The fund will invest equity in utility-scale renewables and support businesses with rooftop solar, energy efficiency, and grid management. IFC’s equity investment includes USD 5 million from the Finland-IFC Blended Finance for Climate Program (BFCP) and USD 10 million from IFC’s own account.

JETPs are a financing mechanism through which wealthier countries fund a coal-dependent country on its transition to clean energy, while addressing the social impacts of the transition. Multilateral development banks have also contributed. Since the concept was first developed in 2021, Indonesia, Vietnam, South Africa, and Senegal have each launched JETPs. Funding can be provided through grants, loans or investments.<sup>28</sup>

The Indonesia JETP, launched in 2022, is an agreement to mobilize USD 20 billion in public and private financing to support a just energy transition in Indonesia, using a mix of grants, concessional loans, market-rate loans, guarantees, and private investments. Indonesia’s investment focus areas include CFPP early retirement and managed phase-out, renewables expansion, and just transition components, among other areas.<sup>29</sup> As noted earlier in this report, the Indonesian government has opted to exclude captive coal plants from its JETP investment plan and will instead conduct a study and roadmap for decarbonizing its captive power systems.

Vietnam’s JETP, also established in 2022, agreed to a USD 15.5 billion energy transition deal. Initial plans for CFPP phaseouts have largely been scrapped, however. The investment plan states “CFPP phase-out at large scale in Vietnam is not feasible in the near-term, but some older CFPPs may be able to transition to alternative energy sources and uses, for which transactions could be piloted.”<sup>30</sup>

---

<sup>24</sup> Global Energy Alliance for People and Planet (GEAPP), “ADB, GEAPP and MAS to Establish Energy Transition Acceleration Finance Partnership in Asia,” December 5, 2023, <https://energyalliance.org/adb-geapp-and-mas-to-establish-energy-transition-acceleration-finance-partnership-in-asia/>.

<sup>25</sup> Ibid.

<sup>26</sup> Bloomberg Philanthropies, “Bloomberg Philanthropies and Goldman Sachs Catalyze ~\$500 Million of Investment in the Clean Energy Transition in South and Southeast Asia,” November 29, 2023, <https://www.bloomberg.org/press/bloomberg-philanthropies-and-goldman-sachs-catalyze-500-million-of-investment-in-the-clean-energy-transition-in-south-and-southeast-asia/>.

<sup>27</sup> International Finance Corporation, “IFC and partners invest in new equity fund to boost clean energy in Southeast Asia,” January 23, 2024, <https://pressroom.ifc.org/All/Pages/PressDetail.aspx?ID=27995>.

<sup>28</sup> Green Network Asia, “What is Just Energy Transition Partnerships?” March 2, 2023, <https://greennetwork.asia/news/what-is-just-energy-transition-partnerships/>.

<sup>29</sup> JETP Indonesia, “What is the approach used in allocating JETP funding?” Accessed March 8, 2024, <https://jetp-id.org/about/what-is-the-approach-used-in-allocating-jetp-funding>.

<sup>30</sup> Government of Vietnam, “Resource Mobilization Plan: Implementing Vietnam’s JETP” (2023), [https://climate.ec.europa.eu/system/files/2023-12/RMP\\_Viet%20Nam\\_Eng\\_%28Final%20to%20publication%29.pdf](https://climate.ec.europa.eu/system/files/2023-12/RMP_Viet%20Nam_Eng_%28Final%20to%20publication%29.pdf).

This overview of multilateral development bank engagement in Southeast Asia energy transition demonstrates some of the growing pains of establishing effective blended financing mechanisms for the transition. Moreover, the C&I sector and captive power are often not primary targets of these types of multilateral financing.

**Climate and Transition Funds**

Investment banks and global alternatives managers have recently launched funds targeting energy transition. Some of these focus on industrial decarbonization and include Asia in their geographic target. See Figure 5 for some examples.

**Figure 5: Examples of Global Funds with Energy Transition Themes**

abrdn	abrdn's Climate Transition Bond Fund invests in debt and debt-related securities issued worldwide, including in emerging markets, that support the transition to a low carbon economy and adaptation to climate change.
Apollo Asset Management	In 2022, Apollo launched a sustainable investing platform aiming to deploy \$100 billion to energy transition and decarbonization of industry. The new platform will invest across asset classes, and will span Apollo's equity, hybrid and yield businesses.
Blackrock	BlackRock has launched an ESG equity fund that targets carbon transition in the materials sector. The BlackRock Global Funds Brown to Green Materials Fund seeks to invest in carbon-intensive companies that have a transition strategy and/or companies that supply the materials for transition. The "brown to green materials" theme spans companies in sectors including chemicals, steel, construction materials, and metals and mining, among others.
Brookfield Asset Management	Brookfield Asset Management and ALTÉRRRA, the world's largest private markets climate vehicle launched at the 2023 World Climate Action Summit, announced the creation of a multi-billion dollar Catalytic Transition Fund (CTF). CTF's mandate is to raise and deploy capital exclusively for emerging and developing markets and includes a focus on industrial decarbonization, energy transition, and climate technologies. Brookfield Global Transition Fund II is Brookfield's flagship fund focused on the energy transition.
Franklin Templeton Investments	Franklin Templeton launched an energy transition alternatives fund in 2023. Its aim is to meet investor demand for exposure to companies associated with energy transition, and its geographic range includes the Asia Pacific region. In 2024, the firm launched a climate fund for venture capital and private equity, with a \$300 million fundraising target. The firm will target areas including industrial decarbonization, energy, resource efficiency, and circular economy.
Goldman Sachs Asset Management	Goldman Sachs' Global Environmental Transition Equity Fund invests in companies worldwide and aims to support the environmental transition by investing in companies with a heavy environmental footprint that are transitioning to a lower one. The majority of investments are currently in North America and Europe, with a much smaller Asia footprint.
KKR	KKR announced in December 2023 that it is seeking to raise up to \$7 billion for its first global climate fund, which would include investments in decarbonizing conventional power and infrastructure.

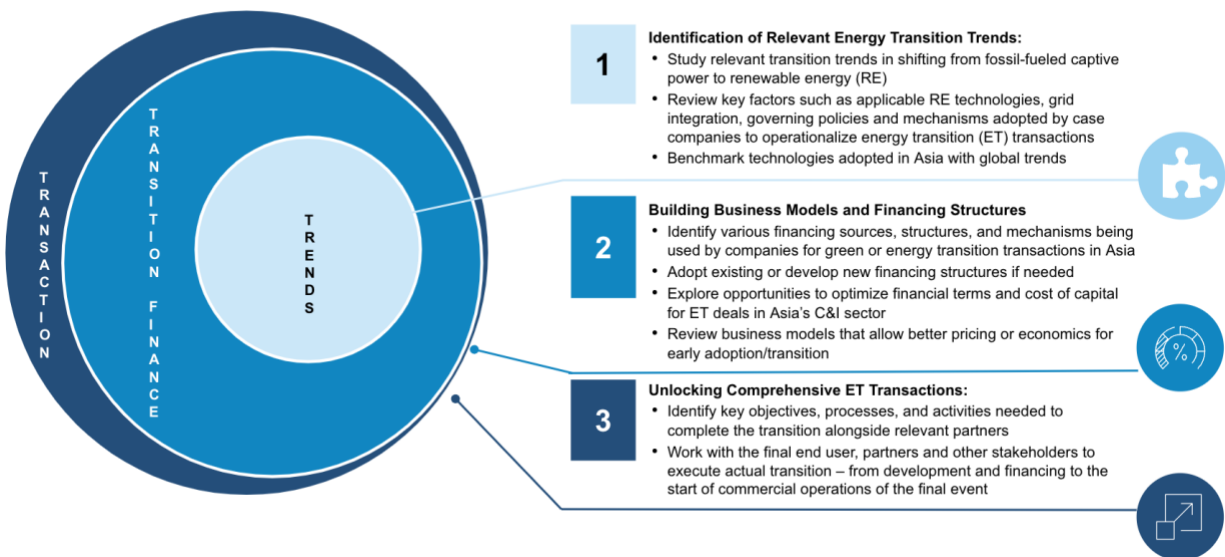
Morgan Stanley's Calvert Sustainable Climate Transition Fund invests in companies whose business models either have a current, direct impact on lowering carbon emissions or are investing significant capital in Property, Plant, and Equipment (PP&E), technology, and processes that will help facilitate lower carbon emissions in the future. The fund invests in global listed real assets with most investments in the United States and Europe.

## Unlocking C&I Energy Transition

Asia's C&I sector needs increased support to transition away from traditional technologies like coal-fired power generation and heating. This support is essential for accelerating large-scale decarbonization efforts in the region. Local banks, international banks, global funds, and blended finance mechanisms all have a role to play. Leading banks at the local and global levels with sophisticated transition taxonomies and detailed financing policies provide valuable frameworks for other capital providers to leverage.

Climate Smart Ventures delivers creative funding solutions maximizing existing frameworks and financing structures to accelerate the retirement of fossil fuel-fired power generation while replacing them with renewables to deliver a just and managed transition suited for Asia's growth. Our firm has been mobilizing C&I sector captive power energy transition through a comprehensive approach, along these following steps – identification of relevant energy transition trends, building business models and financing structures, and unlocking comprehensive energy transition transactions. See Figure 6 for more information on our process.

Figure 6: Unlocking C&I Captive Power Energy Transition



Collaboration, creativity, and optimism are cornerstones of our work as we continue to engage with power asset owners, local banks, and other stakeholders. The early foundations have been established for C&I sector energy transition, as well as the opportunity to build on this important work.

**Appendix - Local Bank Financing and Services for  
Energy Transition-Related Projects**

<b>Philippine Banks</b>	
BDO Unibank - Banco de Oro	<p>As part of its Sustainable Finance program, BDO funds renewable energy (RE) projects and provides energy efficiency (EE) financing.</p> <p>BDO established a 2022 Energy Transition Finance Statement, available <a href="#">here</a>, describing its financing policies. It states: “BDO will support its customers’ transition to reduced carbon emissions by providing access to capital so they may invest in innovative technologies that will lessen their greenhouse gas emissions, or adapt their business to renewable energy alternatives.”</p>
BPI - Bank of the Philippine Islands	<p>BPI's Sustainable Development Finance Program's products and services extend to energy efficiency, renewable energy, and green buildings.</p> <p>BPI's also established an Energy Transition Financing Facility, for which proceeds have been used to accelerate the decommissioning of a coal power plant and support RE.</p>
China Banking Corporation (China Bank)	<p>In 2018, China Bank issued a \$150 million green bond, for which the proceeds were allocated to finance climate-smart projects, including renewable energy, green buildings, energy efficiency and water conservation.</p>
Metrobank - Metropolitan Bank and Trust Company	<p>Metrobank states that it will consider the provision of transition finance to borrowers to support their sustainability journey.</p>
<b>Indonesian Banks</b>	
Bank Central Asia (BCA)	<p>BCA focuses on "green financing" including RE, EE, green buildings and eco-efficient products.</p> <p>The bank aims to increase financing to businesses engaged in developing new and renewable energy, producing less pollution, energy efficiency, and waste management.</p> <p>BCA applies an ESG policy for financing the cement and basic steel industry sector. The bank doesn't state specific activities financed, such as RE or EE, for these sectors.</p>
Bank Mandiri	<p>Bank Mandiri's Sustainable Credit Policy extends to financing RE, including but not limited to solar, wind, geothermal, and hydropower.</p> <p>For the construction of a new coal-fired power plant, the bank considers the suitability of the financing period with the government’s energy transition timeline.</p>
Bank Negara Indonesia (BNI)	<p>BNI's sustainable loan portfolio includes financing renewable energy projects.</p>
Bank Rakyat Indonesia (BRI)	<p>BRI's sustainable financing covers EE, RE, eco-efficient production technologies and processes, and green buildings.</p>
Panin Bank	<p>Panin Bank extends loans to businesses that are tied to sustainability, such as those that are engaged in renewable energy, clean energy, energy efficiency, and eco-efficient manufacturing.</p>

Vietnamese Banks	
Asia Commercial Bank (ACB)	ACB is developing a green financing framework, involving RE, green buildings and efficient resources management.
BIDV	BIDV's "Green Credit" packages support clients in the renewable energy and clean energy sectors, as well as industries with low carbon emissions and climate change adaptation. BIDV also finances energy efficiency projects.  BIDV's Sustainable Loan Framework outlines qualifying activities to guide the development and issuance of thematic loans and sustainability-linked loans.
Techcombank	Techcombank implements programs and policies to encourage lending to 'green', eco-friendly projects. Some of its business development activities in key economic sectors are oriented towards renewable energy projects such as wind, solar and biomass power.
VietCombank	VietCombank finances RE, green energy, and environmental protection projects.
VietinBank	Vietin's Green Up Green Financial Package supports businesses in their journey towards net zero emissions. It finances plans and projects including green energy, green exports (textiles, fabrics, footwear, coffee, rice, wood, seafood), and green buildings.  In December 2023, the Japan Bank for International Cooperation (JBIC) signed a Memorandum of Understanding (MOU) with VietinBank on support for Vietnam's decarbonization and energy transition activities.
VPBank	VPBank's Green Finance Loan Framework's eligible use of proceeds includes RE, EE, eco-friendly and/or circular economy adapted products, production processes and technology, and green buildings.
Thai Banks	
Bangkok Bank	Bangkok Bank provides loans for the production and transmission of electricity from renewable energy sources such as solar power plants, wind power plants and hydropower plants. The bank also provides loans for energy conservation and loans linked to sustainability performance.
Bank of Ayudhya (Krungsri)	In the commercial sector, Krungsri aims to increase financing for energy-saving projects such as solar rooftops and renewable energy. The bank offers a wide range of sustainable finance products and services, including sustainability linked bonds and loans.  The bank will also focus on transition financing to assist corporate clients in transition into low-carbon businesses.
Kasikornbank (KBank)	KBank finances EE and RE projects in existing commercial buildings.  KBank also provides financial products for EE and RE through the 'K-Energy Saving Guarantee Program' loan program, which helps businesses to implement energy-saving projects with guaranteed energy savings contracts by registered Energy Services Companies (ESCOs).



Krung Thai Bank (KTB)	KTB provides credit facilities to the solar power plant industry or friendly alternative energy with the environment.
Siam Commercial Bank (SCB)	<p>SCB finances alternative energy and provides sustainability linked loans.</p> <p>The bank aims to facilitate the transition to a low-carbon economy for all customer segments by providing a range of sustainable finance solutions.</p>
<b>Malaysian Banks</b>	
CIMB Bank	CIMB has established a "Low Carbon Transition Facility" that provides capital expenditure and working capital financing to businesses to facilitate the adoption of sustainable and low carbon practices. These include the installation of solar power systems and improved process efficiency to reduce waste, among other project areas.
Hong Leong Bank	<p>Hong Leong Bank's sustainable financing supports renewable energy, with solar, biogas, and small hydropower identified as the key focus areas. It states that it plans to pursue EE and continue supporting businesses transition towards a low-carbon economy.</p> <p>Proceeds from its green bond issuances go towards EE and RE projects, among other environmentally friendly projects.</p>
Malayan Banking Berhad (Maybank)	<p>Maybank has developed a Transition Finance Framework (TFF), accessible <a href="#">here</a>. It states in its TFF: "Recognising that each company and sector has its unique pathway to decarbonise, a "one-size-fits-all" approach is therefore deemed inappropriate."</p> <p>One of the objectives of the TFF is to "guide the development of credible transition finance solutions within the bank based on internationally accepted guidelines and principles."</p> <p>Eligible activities for transition finance include energy efficiency, renewable energy, and retrofitting existing facilities for sectors including cement, aluminum, and steel manufacturing.</p> <p>For example, with aluminum manufacturing, eligible activities for transition finance include retrofitting of existing facilities that result in an emissions intensity lower than 4.108 tCO<sub>2</sub>e/t<sub>23</sub> through the following measures, including but not limited to: improvement in the thermal efficiency, novel anode technologies, use of renewable energy for smelting, and retrofitting of old smelters.</p> <p>Another category for transition finance is retrofitting of existing CFPPs to allow for: adoption of carbon capture, utilization and/ or storage (CCUS) technology, co-firing with ammonia, co-firing with solid biofuels, and co-firing with hydrogen.</p>

Indian Banks	
HDFC Bank	<p>HDFC Bank's green finance may be allocated to energy efficiency projects and technologies - "Investments, expenditure and financing related to projects and technologies that are designed to enable energy and emissions reductions that aim to achieve at least 20% energy savings."</p> <p>Financing may also be allocated to renewable energy, including solar and wind. However, the bank stated that while it will finance solar and wind captive power plant projects for manufacturing facilities, it excludes "any facilities from fossil fuel or hard-to-abate sectors."</p> <p>Other areas financed include hydropower, geothermal energy, biogas energy, and production of biofuels from waste sources and non-waste biomass.</p>
State Bank of India (SBI)	<p>SBI's ESG Financing Framework makes financing available for EE, RE, and clean energy projects.</p> <p>Under the energy efficiency category, SBI may finance or refinance projects and technologies that are designed to achieve at least a 20% reduction in energy use according to specific applications and criteria, such as battery storage for renewable energy sources.</p> <p>RE and clean energy projects include solar power, wind energy, hydropower, geothermal energy, waste-to-energy projects, and electricity generation from biomass.</p>
Yes Bank	Yes Bank mobilizes climate finance for RE projects.

**Publication Date: March 2024**

Co-authors: Kanchuya Sukdheva, Senior Advisor, and Farzana Hoque, Senior Advisor  
 Contributors: Matthew Carpio, Head of Transaction Advisory, Bhavya Puri, Associate, Katrina Abenojar, Associate, and Evano Djatmiko, Analyst

**About Climate Smart Ventures**

Climate Smart Ventures (CSV) is an advisory firm advancing the energy transition in Asia. Our expertise and projects span coal to clean utility-level energy transition, industrial decarbonization, grid transformation, transition finance, and government-level policy recommendations. We also provide ESG and sustainability advisory services, focused on decarbonization and management of environmental and social impacts. Ecosystem building and collaboration are key elements of our firm, which partners closely with the region’s leading corporates and power portfolio owners, investors, off-takers, and others. For more information, visit our website <https://climatesmartventures.com> or send us a message at [contact@climatesmartventures.com](mailto:contact@climatesmartventures.com).