ASIA TRANSITION FINANCE STUDY GROUP (ATF SG) ANNUAL REPORT

Unlocking Transition Finance in Asia

– Ensuring feasibility and bankability through risk management by public and private collaboration

September 2024

CONTENTS

LIST OF EXHIBITS

LIST OF CASE EXAMPLES

LIST OF ABBREVIATIONS

ACGF	ASEAN Catalytic Green Finance Facility
ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
ATF SG	Asia Transition Finance Study Group
BESS	Battery Energy Storage System
BTM	Behind The Meter
CAGR	Compound Annual Growth Rate
CCUS	Carbon Capture, Utilization, and Storage
CO_2	Carbon Dioxide
DNSH	Do No Significant Harm
EPCI	Engineering, Procurement, Construction and Installation
ESG	Environment, Social, and Governance
EU	European Union
FI	Financial institution
FTM	Front of The Meter
FX	Foreign Exchange
GCF	Green Climate Fund
GHG	Greenhouse Gases
GSMEF	Global SME Finance Facility
GW	Gigawatt
ICMA	International Capital Market Association
IEA	International Energy Agency
IFC	International Finance Corporation
kW, kWh, ΔkW	kilowatt, kilowatt-hours, delta/change in kilowatts
MDB	Multilateral Development Bank
MIGA	Multilateral Investment Guarantee Agency
O&M	Operation and Maintenance
OECD	Organization for Economic Co-operation and Development
PPA	Power Purchase Agreement
PV	Photovoltaic
R&D	Research & Development
SME	Small and Medium-sized Enterprises
STEPS	Stated Policies Scenario
TLP	Technology List and Perspectives for Transition Finance in Asia
UK	United Kingdom
UoP	Use-of-Proceeds

USD	United States Dollar

FOREWORD AND ACKNOWLEDGEMENTS

The Asia Transition Finance Study Group (the Study Group) is a private group led by financial institutions (FIs), mainly Asian and global banks. Its goal is to promote transition finance (TF)[1] in Asian countries. The Study Group developed guidelines for FIs and suggested support measures to relevant parties as the outcome of its 2022 sessions and published the 2023 Annual Report outlining progress in the TF landscape, including challenges and potential responses.

While FIs are its core members, the Study Group shares the practical challenges faced by FIs with other participants such as development banks, export credit agencies, financial and energy public authorities (Exhibit 1). By doing so, it serves as a forum to promote communication between the public and private sectors, enhancing mutual understanding of practical issues related to transition activities, including interoperability of taxonomies. In addition to exploring possible solutions to TF obstacles, the Study Group also exchanges information with corporates in the energy sector to gain knowledge and insights from energy and industry players in Asia.

In 2024, the Study Group held six peer learning sessions with its members and various guests from both the public and private sectors. The results of these events are summarized in this document, with the hope that they will lead to more transactions fostering the transition to a sustainable society in the future.

The reference documents resulting from the ATF Study Group discussions (*Asia Transition Finance Guidelines* in 2022, the *Asia Transition Finance SG (ATF SG) Annual Report 2023*, and the *ATF SG Annual Report 2024*) are non-binding and are intended to assist members in providing financing for transition activities. The final decision on whether to apply these deliverables to practical operations is at the discretion of each FI.

The *ATF SG Annual Report 2024* highlights the importance, challenges, and key enablers to ensure the feasibility and bankability of transition projects focusing on risk management through public and private collaborations, based on Study Group activities during the year. Additionally, the report outlines key challenges and enablers for net-zero transition of small and medium enterprises (SMEs), which was one of the key issues identified in the ATF SG 2023. As its name suggests, the *ATF SG Annual Report 2024* provides references regarding TF, but each FI must use its own case-by-case judgment on how to follow the guidance. There is no guarantee that in doing so will result in the financing being labeled as TF[2].

The Study Group would like to thank all those who assisted in the work of the Study Group and contributed to this report.

[1] The definition of transition finance used in this report can be found in the appendix

[2] Transition labels are certified through further assessments, which could include second party opinions. *ATF Guidelines*, issued in 2022, and case studies presented in this *ATF SG Annual Report 2023/2024,* do not determine whether projects merit financing.

Exhibit 1: The ATF Study Group members

(as of Sep 30, 2024)

(x) # of confirmed participants

Category		Participants		
Members	**Financial Institutions (20)**	**Asia FIs** • Bank Danamon • Bank Mandiri • Bank of Ayudhya • BDO Unibank • Kasikornbank • Maybank • Mizuho Financial Group • MUFG Bank • Power Finance Corporation • Security Bank • Sumitomo Mitsui Banking Corporation • Sumitomo Mitsui Trust Bank • VietinBank • First Abu Dhabi Bank • E.SUN Bank	**Global FIs** • Brookfield • Barclays Bank • Citi • HSBC • Standard Chartered Bank	
Partners & Guests	**Development banks, ECAs, and others (7)**	**Multilateral** • International Finance Corporation	**ECA** • Export-Import Bank of Thailand • Japan Bank for International Cooperation • Nippon Export and Investment Insurance	**Others** • Development Bank of Japan • DBS Bank • United Overseas Bank
	Public agencies and finance associations (15)	• ASEAN Taxonomy Board • Australian Government • Department of Energy, Republic of the Philippines • Financial Services Agency, Japan • International Capital Market Association	• Japanese Bankers Association • Japan International Cooperation Agency • Ministry of Economy, Malaysia • Ministry of Economy, Trade and Industry, Japan • Ministry of Energy and Mineral Resources, Indonesia	• Ministry of Energy, Thailand • Ministry of Finance, Indonesia • Ministry of the Environment, Japan • Ministry of Finance, Japan • Sustainable Finance Institute Asia
	Knowledge Contributors (4)	• DNV • Economic Research Institute for ASEAN and East Asia (ERIA) • Japan Credit Rating Agency Ltd. (JCR) • Moody's	ATF SG has invited energy/industry players as guest speakers	

ATF SG receives logistical support by ERIA as a secretariat. All decisions on agenda, direction, outputs are made solely by the ATF SG members. Outputs of the ATF SG do not represent any individual member's stance or point of view.

NOTES FROM THE SECRETARIAT

In 2024, daily global average temperature reached a record high[3]. The urgency to make energy transition is ever rising. Since the ATF SG was established, significant progress has been observed both within and outside of the study group. The ATF SG has continued discussing to make transition projects financeable. In Asia, many counties have committed to net-zero, launched roadmaps and taxonomies and have taken actions. However, transition finance is yet to scale. One of most important prerequisites to materialize transition projects is that all the stakeholders are motivated and confident about the business. Project design and business model always precede finance. Commercial feasibility is a key underlying presumption of bankability. Challenges for transition finance are not only financial but also business issues.

To move transition finance forward, the ATF SG this year has devoted itself to discussing how to make projects commercially feasible. The study group has identified risks which affect feasibility. Each transition project has a different risk spectrum. In addition to technological readiness, environmental, social, reputational and regulatory risks are significant in transition projects, as they may result in material adverse effects which exceed the private sector's capacity. Robust and stable rule making, including securing revenue stream, consistent approaches and requirements for license and permits, and clear boundaries of responsibility and liability is effective in managing risks so that transition projects can be commercially feasible.

Financing is a process to allocate and control risks associated with a project. Once a transition project has been deemed commercially feasible, the next step is to share the remaining risks among stakeholders and to assess the risks are well managed and controlled. To exercise risk mitigation and allocation, the study group this year applied CCUS and BESS for hypothetical case studies. CCUS is a key technology that enables decarbonization in hard-to-abate sectors. Technologies and projects which support transition are also essential. Load-following capacity, including BESS, is underlying infrastructure to scale renewable capacity.

Through the case studies and expert panels, the ATF SG highlighted the importance of collaboration across a broader range of stakeholders. Major findings for this year include the roles of insurance/guarantees and advisors. First, public insurance and guarantees are effective solutions to separate risk-taking from funding. They enable the leveraging of private funding while covering material adverse effects that exceed the risk capacity of the private sector. Second, advisors play a remarkable role in assessing risks. Having capable advisors who understand advanced technology and the Asian context helps project owners and financial institutions to mitigate and assess risks. They are invaluable in fulfilling the conditions precedent to financing transition projects.

Lastly, the ATF SG continues to explore blended finance. As widely discussed, blended finance is an effective solution to mobilize transition projects. Now, the question is not if but how to blend concessional and private capital. Also, public support is not necessarily financial. Non-financial arrangements such as a robust roadmap, a transparent regulatory framework, and clear risk boundaries form the solid foundation of transition projects.

Transition projects are never realized by a single stakeholder. Cooperation among stakeholders with different capabilities and capacities enables risk mitigation and allocation, which makes transition projects possible. Collaboration between the real economy and finance is essential not only in private companies but also in the public sector. The ATF SG is a unique agora that invites diverse members

[3] https://climate.copernicus.eu/new-record-daily-global-average-temperature-reached-july-2024

across the real economy/finance and public/private sectors. The study group sincerely believes that fair and open discussion enables a just and orderly transition in Asia.

Mizuho Financial Group and ERIA (Economic Research Institute for ASEAN and East Asia) on behalf of the ATF SG Secretariat

EXECUTIVE SUMMARY WITH KEY PROGRESS AND FINDINGS IN 2024

TRANSITION FINANCE RECAP

As the world experiences the impact of climate change, the need for capital to accelerate the shift to net zero/carbon neutrality has become heightened. In developing transition projects, financing can help unlock the scale needed to meet the high volume of projects required to move the region closer to carbon neutrality. In Asia, the development of sustainability-related financial products has been growing. For example, the volume of sustainable debt issuances in the Association of Southeast Asian Nations (ASEAN) reached approximately USD 60 billion in 2022, compared to approximately USD 7 billion in 2018[4]. However, the region has not yet seen the scale it needs to address the financing gap. The International Energy Agency (IEA) projects that annual clean energy investment needs in ASEAN will reach USD 180 billion by 2030 and USD 240 billion by 2035[5].

PAST ASIA TRANSITION FINANCE STUDY GROUP ACTIVITIES

The Study Group was established in 2021, led by private financial institutions (FIs), to foster a "just and orderly" transition in the region. Through much discussion and knowledge sharing, the Study Group has thus far identified key challenges to scaling TF in the region, including differing standards, unclear eligibility requirements, and a lack of local references. The Study Group also assessed how various stakeholders can support the growth of TF, including developing sector/country-level pathways to guide real economy players on their transition plans, ensuring the interoperability of taxonomies across the region, and developing risk management mechanisms for transition projects to ensure economic viability.

As outputs from its activities, the Study Group issued the ATF Guideline and suggested seven support measures in its Activity Report in 2022. In the 2023 Annual Report, the Study Group highlighted three key enablers to promote TF. Recently, the region has been progressing in a favorable direction, with initiatives across the region related to TF support measures and enablers, including the development of taxonomies and transition pathways.

THE ATF SG ACTIVITIES AND MAJOR FINDINGS IN 2024

In 2024, the Study Group focused on how to make transition projects feasible and bankable, which was the fundamental issue identified through discussions in 2022 and 2023. The Study Group held six learning sessions in 2024 to gain a multifaceted view of the challenges and opportunities in managing the risks of TF projects, including blended finance, insurance, and hypothetical case studies of risk management for Carbon Capture, Utilization, and Storage (CCUS) and Battery Energy Storage System (BESS) projects.

Through discussions, the Study Group found that an overarching theme relevant to scaling TF is the optimal allocation of risk between the public and private sectors. Some risks are best addressed by public sector stakeholders such as governments, regulators, and multilateral development banks (MDBs). Key tools the public sector has to help mitigate TF risk include ensuring a sound regulatory environment and scaling blended finance instruments. On the other hand, other risks can be borne

[4] IEA, Role of Sustainable and Transition Finance Instruments, October 2023, https://iea.blob.core.windows.net/assets/f4875516-8106-4413-997b-2433106bf7e2/ACE_EFC_IEAevent_clean.pdf

[5] IEA, Webinar on Sustainable Finance for Clean Energy in ASEAN, October 2023, https://www.iea.org/events/webinar-on-sustainable-finance-for-clean-energy-in-asean

and mitigated by private sector players, including project developers, lenders, investors, insurers, advisors, and contractors. By developing transition projects in an ethical manner and collaborating across sectors to build capabilities and ensure interoperability, the public sector can significantly contribute to unlocking further TF.

This Annual Report reflects these discussions by outlining the main risks of transition projects and how each risk can be addressed by the public and private sectors. To provide an illustrative example, the risk allocation and mitigation process is also examined through the lens of CCUS and BESS projects. It also delves into some of the key actors, including regulators, insurance and guarantee providers, and advisors. The report also reflects in-depth discussions the Study Group had on blended finance as an effective tool to combine the capital and capabilities of both the public and private sectors.

As an outcome of the discussions, the Study Group identified the following key elements to scale TF in a just and sustainable manner:

① Ample public sector support from governments and regulators through market-enabling activities such as robust and sound regulatory environments, clear country/sector-wide transition pathways, and financial support.

② Ethical project development and the effective usage of insurance and guarantees to enhance project feasibility and bankability.

③ Blended finance and its unique ability to catalyze private sector investment with the support of concessional capital provided by the public sector and donors.

④ Enhancing the capabilities of stakeholders through advisor support and collaboration via data and knowledge sharing.

GOING FORWARD

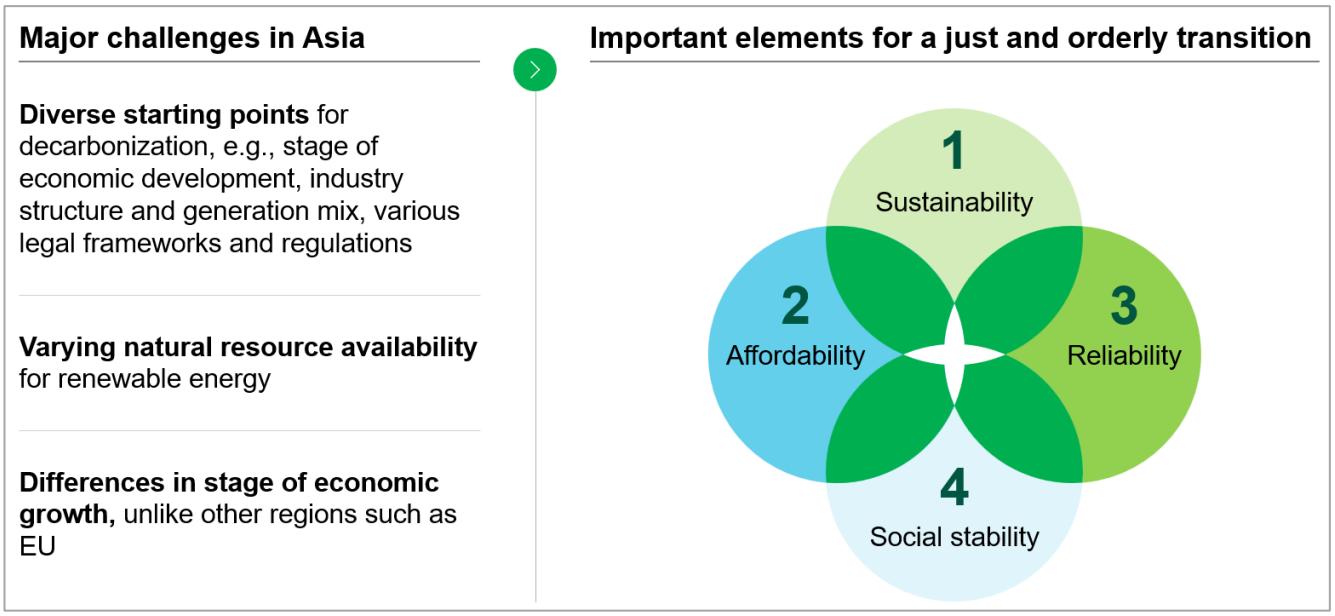
Faced with the increasing responsibility to manage financed emissions while supporting economic growth in Asia, FI members of the Study Group share a common concern about how to pursue a just and orderly transition. Building on the ATF Study Group's initiatives since 2021, the Study Group's discussions in 2024 have led to a more detailed examination of how transition projects can be scaled through effective risk management. Effective risk mitigation and allocation allow transition projects to become commercially feasible, providing comfort for equity investments from developers and investors. A more comprehensive risk management process leads to project bankability, thereby facilitating access to debt financing and advancing the scale required for the region's energy transition. Moving forward, the Study Group aims to continue knowledge sharing and discussions while translating these discussions into more concrete initiatives by outlining how various stakeholders in both the public and private sectors can collaborate for the development of economically viable and bankable transition projects to unlock TF in Asia.

1 INTRODUCTION

1.1 POSITIONING TRANSITION FINANCE AND ENSURING STABLE TRANSITIONS

Asia is at the center of the energy transition, accounting for the majority of global GDP, energy consumption, and emissions[6]. The region faces multiple challenges in its journey toward decarbonization, including diverse starting points such as a high dependency on coal, varying natural resource availability for renewable energy, and differences in stages of economic growth compared to other regions such as the European Union (EU). TF plays a pivotal role by aiding companies that are committed to reducing greenhouse gas (GHG) emissions as part of their long-term strategies aimed at achieving net-zero or carbon-neutral status. Furthermore, TF is essential for facilitating a just and orderly transition, which is crucial for Asia to meet the objectives outlined in the Paris Agreement. A just and orderly transition not only promotes climate sustainability but also ensures the reliability and affordability of energy supplies for governments and their citizens. At the same time, it maintains social stability by striking a delicate balance between sustainability, reliability, and affordability.

Exhibit 2: Essential elements for a just and orderly transition



Over the past four years, the ATF SG has explored the challenges and key enablers that stakeholders across the region see in achieving a balanced energy transition.

In September 2022, the Study Group published the *ATF Guidelines* and the *ATF Activity Report* as deliverables and presented them at the Asia Green Growth Partnership Ministerial Meeting (AG). The *ATF Guidelines* provided practical guidance, including how to use an interim approach when country-level or sector-level pathways and technology roadmaps for Asia are insufficient. The *ATF Activity Report* included the following seven suggested support measures:

[6] McKinsey & Company, Global Energy Perspective, October 2023, https://www.mckinsey.com/industries/oil-and-gas/our-insights/global-energy-perspective-2023/

Suggested Support Measures：

① Create sector-level or country-level pathways and technology roadmaps for Asia

② Consideration of a just and orderly transition in accelerating decarbonization

③ Financing or stakeholder support for transition finance/pilot cases in Asia

④ Promote the interoperability of regional and country taxonomies

⑤ Create guidelines on the role of carbon credits in transition finance

⑥ Development of transition support for SMEs

⑦ Promote acquisition and development of relevant skills to transition technologies

In 2023, the Study Group focused on deepening the understanding of the challenges that FIs face, as well as uncovering what needs to take place to enhance the continued evolution of these support measures. The Study Group conducted several learning sessions, one-on-one sessions, and a survey. In September 2023, the Study Group published *the ATF SG Annual Report* as a deliverable and presented it at the Asia Green Growth Partnership Ministerial Meeting. Among the challenges in unlocking TF, *the ATF SG Annual Report 2023* highlighted the following three key enablers to further promote TF:

Key Enablers:

① De-risking mechanisms to underpin economic viability of transition projects

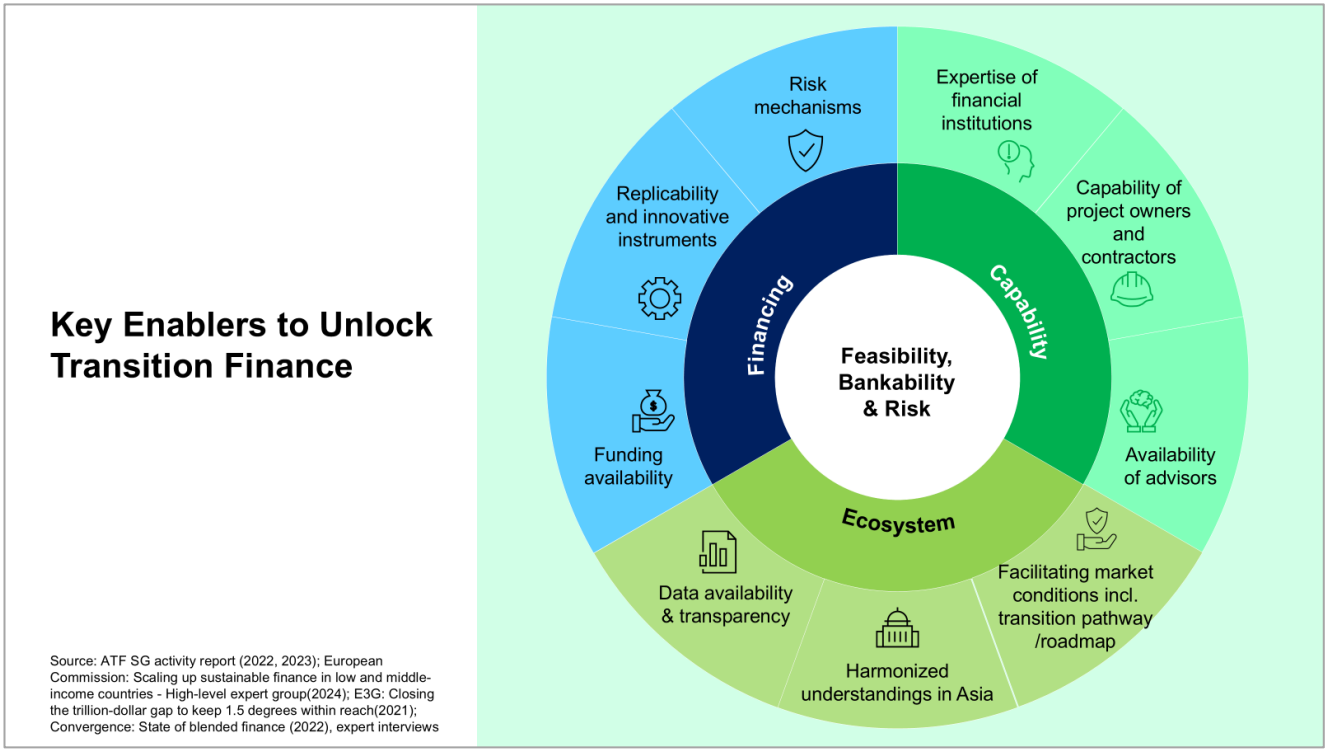
② Sectorial and/or national transition roadmaps/pathways, to clearly position the role of transition activities and cover enough sectors and technologies

③ Simplified and tailored TF guidelines and a data platform for SMEs to unlock their capability and capacity issues

1.2 CHALLENGES OF TRANSITION FINANCE

Based on the discussions so far, the Study Group categorized the key enablers to unlocking TF into capability, ecosystem, and financing as shown in Exhibit 3.

Exhibit 3: Key enablers to unlocking transition finance



Addressing the capability of FIs in providing funds, project owners and contractors utilizing these funds, and advisors offering analysis and support is crucial to scale TF. FIs face challenges due to uncertain business environments, nascent business models, and limited track records, with few case examples to reference when assessing or developing TF. Additionally, the insufficient capability of TF recipients to implement TF requirements in their daily practices poses a major challenge.

Empowering TF recipients, primarily project developers, to build transition plans is crucial for aligning projects with their overall strategy. However, companies often struggle to develop these plans without guidance from the public sector. The public sector plays an essential role in creating country, regional, or sectoral transition pathways and roadmaps, helping stakeholders prioritize projects and understand how to align them with wider regulatory and strategic frameworks. Ensuring a supportive ecosystem for TF requires public-private collaboration to facilitate market conditions, harmonize standards across Asia, and ensure data availability and transparency. The lack of sectoral transition roadmaps and pathways remains a significant challenge, as highlighted by the ATF SG. While some progress has been made in developing sector-level or country-level guidelines, clear guidelines and roadmaps issued by governments remain critical enablers for both TF providers and recipients, ensuring long-term predictability and informing their transition planning.

Also, differing standards were highlighted by the ATF SG. These differing standards create a situation where TF practitioners must cope with and navigate through various standards and taxonomies, delaying the implementation of TF. Additionally, the lack of localized references, with Asia being short of official national and sectoral pathways to climate neutrality that align with the Paris Agreement, is a challenge that needs to be overcome.

Finally, increasing funding availability for transition projects, developing replicable and innovative financial instruments, and revisiting risk mechanisms and managing risks related to transition projects are financial issues that must be addressed to further enhance TF. A major challenge in financing is the lack of de-risking mechanisms, as transition projects often pose high risks and low returns, limiting the appetite of FIs.

In 2024, the ATF SG continued the discussion of unlocking TF in Asia, collaborating with multiple stakeholders. One of the remarkable progresses the Study Group made this year is incorporating the perspectives of advisors and insurance/guarantee providers for the first time through their participation in SG discussions as guest speakers.

Although all the above elements are imperative to accelerate the TF in Asia, the ATF SG 2024 focused on risk reduction and allocation mechanisms, which is the fundamental issue we have identified through surveys, one-on-ones, and learning sessions. The lack of de-risking/risk allocation measures has been brought up as a significant reason among the many reasons why FIs have not been able to accelerate TF. From the perspective of FIs, it is not possible to provide loans to projects that are not feasible and bankable, often due to high risk.

In 2024, the Study Group conducted six learning sessions related to risk management, which are summarized in this report. Chapter 2 provides an overview of the risk landscape of TF projects, highlighting the importance of feasibility and bankability. It emphasizes the significance of appropriate risk allocation among stakeholders to achieve these two critical factors. Chapters 3 to 5 delve into how we can mitigate and allocate risks based on the insights gained through our discussions in the learning sessions. These chapters build on the foundational understanding from Chapter 2, highlighting the challenges and necessary unlocks for effective risk management in transition projects.

2 RISK LANDSCAPE OF TF PROJECTS

2.1 BARRIERS TO SCALING TRANSITION PROJECTS IN ASIA

Feasibility and bankability are key prerequisites to securing TF debt. In the ATF SG discussions, feasibility refers to a project's readiness for implementation, driven by a wide variety of factors including, but not limited to, its ability to generate cash flows and the fulfillment of key legal, environmental, social and technical prerequisites for its implementation. Bankability takes this a step further. Even if projects are feasible, they may not be able to attract debt funding, and may need to be fully funded by sponsor equity. Projects become bankable when lenders feel confident that they will generate sufficient cashflows to meet debt repayment obligations. Bankability is influenced by project- and context-specific factors, such as market structure, policy and regulatory environment, and risk levels.

It is important to note that transition projects can materialize without bankability if the projects can be funded fully by equity. The source of equity may include the balance sheet of project developers, equity investors, or government funds. However, supplementing equity financing with debt allows transition projects to be implemented at a much greater scale. Bank debt is crucial to scale industries as it provides leverage, enabling project developers to undertake larger and more numerous initiatives than equity financing alone would allow. This financial flexibility accelerates growth and facilitates the energy transition. Hence, the ATF SG discussions in 2024 have focused on ensuring the bankability of TF projects.

The concepts of feasibility and bankability are closely connected. Lenders require assurance of a project's feasibility before they delve into detailed discussions on its bankability. In essence, a project's feasibility lays the groundwork for its bankability. Ensuring both feasibility and bankability is crucial to secure debt, particularly from private FIs. However, most projects related to the energy transition are not feasible because they are exposed to multiple risks that can affect both feasibility and bankability. In this sense, transition projects face not only financial issues, but also business issues.

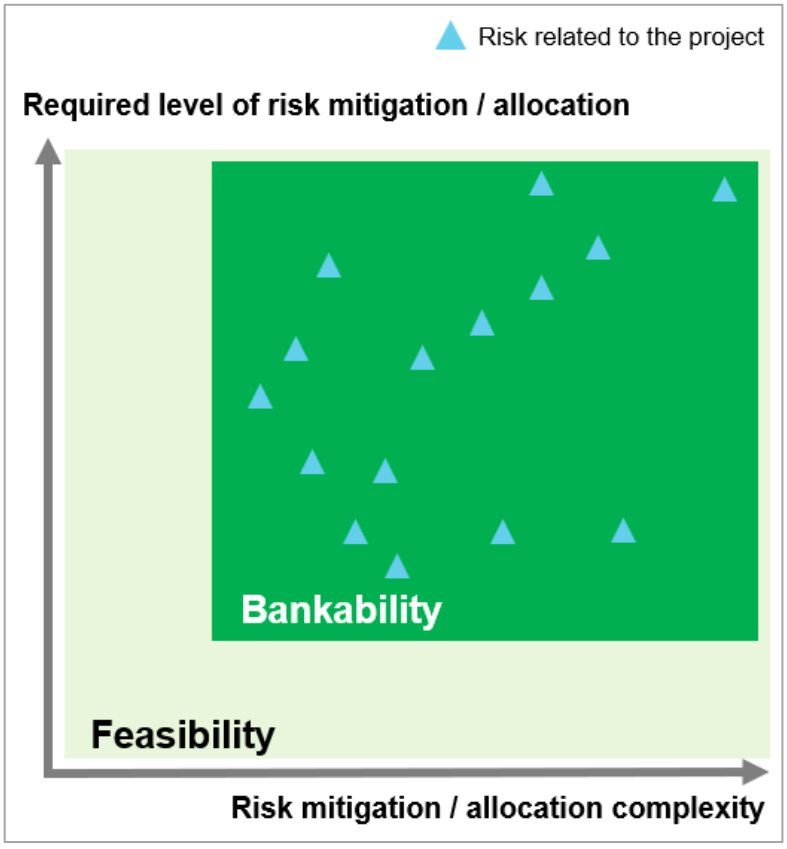
Although there are various ways to categorize risks, this year, the ATF SG has categorized the main risks, inter alia, as follows:

Risk	Definition
Credit risk	• Risk of stakeholders not carrying out their contractual duties, (e.g., debt repayment, purchasing electricity) • Stakeholders include offtakers, developers, and contractors
Cashflow risk	• Risk of insufficient cash inflows to cover expenses and debt obligations • Stems from volatility in revenue and costs
Development risk	• Risk of delays or cost overruns during the development phase • Covers planning and permitting activities
Construction risk	• Risk of delays or cost overruns during the construction phase
Operational risk	• Risk of disruptions or inefficiencies due to project operations and maintenance • Affected by processes, systems, external events, etc.
Technological risk	• Risk of technological failures or obsolescence impacting project performance

Risk	Definition
Environmental risk	• Risk of environmental damage, including pollution, radiation, noise, land use, biodiversity and climate change
Social risk	• Risk of negative social impacts on labor, the local community and other key stakeholders
Reputational risk	• Risk of damage to the project's reputation or public perception
Regulatory risk	• Risk of changes in policies, or unclear or inconsistent regulations impacting project viability
Political risk	• Risk of political instability, government intervention, or sovereign insolvency affecting the project
Currency/interest rate risk	• Risk of liquidity and fluctuations in foreign exchange and money markets affecting project stability

The risks outlined above need to be carefully assessed and managed to ensure both feasibility and bankability. The need for and complexity of risk mitigation and allocation may fluctuate depending on project location and the technology used. While all risks need to be managed, particular attention must be paid to those with high necessity and complexity based on the project's context. Potential approaches to risk management and the challenges therein are covered in detail in later sections.

Exhibit 4: Relationships between risks, feasibility, and bankability



Risk management is especially important for transition projects. Exhibit 4 is an illustrative example of how various project risks can be distributed. Some risks are higher for transition projects, such as CCUS, coal plant retirement, and sustainable fuel co-firing (Exhibit 5). This is owing to a variety of

factors, including uncertain revenue streams, unproven business models, uncertain regulatory environments, and relatively limited technological maturity.

Exhibit 5: Simplified mapping of key risks to selected climate technologies in Asia

Risk applicability: Strong | Partial | Limited

NOT EXHAUSTIVE	Zero-emission technologies				Transition technologies		
Risks	**Solar PV**	**Wind**	**BESS**	**Nuclear**	**CCUS**	**Coal plant retirement**	**Sustainable fuels co-firing**
Cash flow risk	Complex dependencies e.g., business model, weather, market conditions, regulatory structure				No/uncertain revenue streams		Demand for coal and gas power
Credit risk	Complex dependencies e.g., capital structure, credit rating of project owner				Business model not proven at scale		Demand for coal and gas power
Development risk	Long and unpredictable permitting process			Complex permitting	Emerging regulation	Permitting & planning	Emerging regulation
Construction risk	Emerging technologies and best practices			Complex technology	Immature technology	Remediation & demolition	Emerging technology
Operating risk	Dependency on weather and energy market		Degradation and flammability	Feedstock availability	Immature technology	N/A	Emerging technology
Transport and storage risk	N/A			Prevention and mitigation costs	Leakage and capacity risks	N/A	
Technological risk	Mature technology				Not yet proven at industrial scale	N/A	Evolving technology
Environmental risk	Infra ecosystem interference		Limited impact	Radiation risk	Infra ecosystem interference	Positive impact	Continued emissions
Social risk	NIMBY[2]		Limited impact	Potential societal health risks on HSE incidents		Labor force reduction	Fossil fuel burning health risks
Reputational risk	Neutral/positive societal perception			Potentially controversial	Neutral/positive societal perception		Greenwashing risk
Regulatory risk	Dependency on environmental, climate and energy policy and fiscal policy		Strong dependency on environmental, climate and energy policy, as well as energy security, social stability, and market development				
Political risk	Similar to regulatory risk		Similar to regulatory risk	Feedstock supplier	Similar to regulatory risk		
Currency and interest rate risk	Common risk						
Force majeure risk	Common risk			Magnifying potential	Common risk		
Legal risk	Common risk						

1. Risk mapping may change depending on nature of technology, country and market contexts, and objective of the financing
2. Not in my back yard

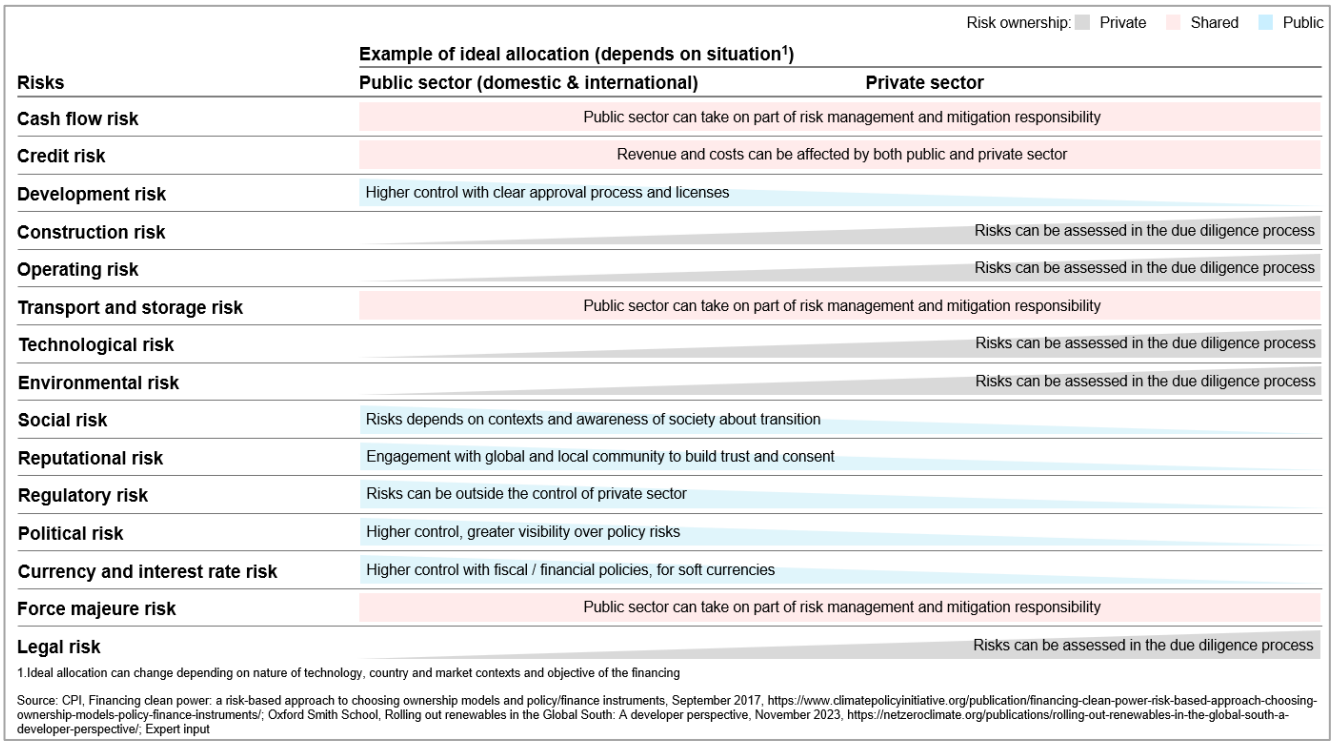
Source: CPI, Financing clean power: a risk-based approach to choosing ownership models and policy/finance instruments, September 2017, https://www.climatepolicyinitiative.org/publication/financing-clean-power-risk-based-approach-choosing-ownership-models-policy-finance-instruments/; Oxford Smith School, Rolling out renewables in the Global South: A developer perspective, November 2023, https://netzeroclimate.org/publications/rolling-out-renewables-in-the-global-south-a-developer-perspective/; Expert input

2.2 IMPORTANCE OF REALLOCATING RISKS

Risks related to transition projects can be managed in two key ways: (1) risk reduction or mitigation, and (2) risk allocation. Risk reduction or risk mitigation refers to the process of reducing the overall project risk to a manageable level. Robust policies and regulatory frameworks driven by the public sector are key in reducing overall risk, creating an environment that permits developers to take managed risks to implement transition projects. Also, effective project design, such as technology selection, and creating financial structures such as reserve and contingency accounts, are examples of risk reduction. Risk allocation, on the other hand, does not significantly impact the overall level of project risk. Rather, it is a process to divide risks among project stakeholders, reflecting the varying level of risk appetite and tolerance. An example of risk allocation is insurance products, whereby the purchaser of the insurance offloads some risks to the insurer. This report collectively refers to the two concepts as “risk management”.

Effective risk management in complex transition projects necessitates collaboration among stakeholders from both public and private sectors. Furthermore, given the relatively limited capacity of private FIs to take on risk, collaboration with stakeholders to better spread risk is crucial. Certain risks, such as development risk, reputational risk, regulatory risk, political risk, and currency and interest rate risk, can be managed effectively by public sector stakeholders. In contrast, risks such as construction, operating, technological, environmental, and social risks can be managed effectively by private sector stakeholders through the due diligence process. Some risks, such as cash flow, credit, transport and storage, and force majeure risks, require shared management by public and private sector stakeholders. (Exhibit 6)

Exhibit 6: Potential risk allocation for key transition project risks



Although Exhibit 6 provides a high-level overview of potential risk allocation between public and private sectors, effective risk allocation needs to be considered at a more granular level, focusing on individual stakeholders within each sector. For example, within the private sector, it is important to consider the risks that can be addressed by various stakeholders including FIs, project owners, and insurance providers.

The ATF SG's discussions in 2024 focused on how risks impact each stakeholder and project, and how best to allocate them among stakeholders. To further explore these critical aspects, the following chapters of this annual report will delve into the three perspectives that emerged from our discussions:

- **RISK MANAGEMENT FOR EXAMPLE TECHNOLOGIES (Chapter 3)**: This chapter will analyze the specific risks and challenges associated with example transition projects, and discuss potential approaches to effective risk management
- **COLLABORATION WITH BROADER STAKEHOLDERS (Chapter 4)**: This chapter will examine the necessity of involving a diverse range of stakeholders, including public sector entities (e.g., governments, Multilateral Development Banks (MDBs)) and private sector participants (e.g., FIs, insurance companies), to achieve comprehensive risk management
- **FINANCING INSTRUMENTS FOR RISK ALLOCATION (Chapter 5)**: The final chapter will focus on a key financing mechanism, blended finance, which can be employed to distribute risks among stakeholders and enhance the feasibility and bankability of transition projects

These chapters will provide a detailed examination of how we can collectively address the risks associated with TF in Asia, ensuring that both feasibility and bankability are effectively achieved to facilitate successful project implementation. The chapters will present insights and details based on the ATF SG's discussions in 2024, offering suggestions to navigate the complexities of TF in the region.

3 RISK MANAGEMENT FOR EXAMPLE TECHNOLOGIES

This chapter examines risk mitigation and allocation for transition projects within the context of scaling TF. It begins by identifying key risks associated with transition projects and discussing how they can be mitigated through strategic allocation to appropriate stakeholders, using tools such as insurance products, long-term offtake contracts, and public financial and regulatory support. It then goes on to illustrate the process using two examples: CCUS and BESS. Both have unique risks that must be addressed to secure financing. Insights are drawn from the ATF SG's learning sessions, which included discussions among commercial FIs, MDBs, insurers, governments, project developers, and advisors, providing a multidimensional view of risk management in TF.

3.1 RISK ASSESSMENT AND MANAGEMENT OVERVIEW

Transition assets such as CCUS and power storage systems often require heavy upfront investment. While some developers can fund such projects with equity using their balance sheets, debt funding could help more developers enter the space. To enable the development of more projects, debt financing is key. This chapter discusses how proper risk identification, mitigation and allocation can help unlock further opportunities.

3.1.1 Identification and allocation of key risks

A key challenge identified by the Study Group in scaling TF is the allocation of project risks among various stakeholders. Making a project bankable is a risk allocation exercise, cataloguing and mitigating risks until all key items are covered. During the learning sessions, the Study Group identified key risks associated with transition asset projects and mapped out how each of them can be appropriately reallocated to stakeholders best suited to manage the risk.

Key project risks and examples of reallocation and mitigating measures are listed below:

Risk	Definition	Relevant to/borne by	Example allocation and mitigating measures
Credit risk	• Risk of stakeholders not carrying out their contractual duties, (e.g., debt repayment, purchasing electricity) • Stakeholders include offtakers, developers, and contractors	• Providers of capital, including lenders and equity investors (project sponsors)	• Stringent due diligence of project stakeholders, including financial resilience and track record
Cashflow risk	• Risk of insufficient cash inflows to cover expenses and debt obligations • Stem from volatility in revenue and costs	• Providers of capital, including lenders and equity investors (project sponsors)	• Institutional mechanisms such as regulatory and financial support by governments to secure revenue and to recover costs and ensure fair returns • Financial terms and conditions (e.g. debt sizing and reserves) reflecting risks

Risk	Definition	Relevant to/borne by	Example allocation and mitigating measures
Development risk	• Risk of delays or cost overruns during the development phase • Development activities include planning and permitting	• Project sponsors who develop the project • Typically, not borne by lenders as project debt is largely provided after the development phase	• Adequate legal frameworks and permitting regulations to help de-risk project development activities • Retention of capable external advisors
Construction risk	• Risk of delays or cost overruns during the construction phase	• Engineering, Procurement, Construction and Installation (EPCI) contractors	• Lump sum contracts and turnkey contracts with contractors • Thorough technical due diligence • Adequate insurance to cover risks during the construction period • Retention of capable external advisors to examine risks
Operational risk	• Risk of disruptions or inefficiencies due to project operations and maintenance • Operations are affected by processes, systems, external events, etc.	• Operation and Maintenance (O&M) contractors	• Performance warranty clauses in O&M contracts • Thorough due diligence of project operators • Retention of capable external advisors to examine risks • Adequate insurance to cover risks during the operation period
Technological risk	• Risk of technological failures or obsolescence impacting project performance	• Relevant to all stakeholders, particularly EPCI contractors	• Quality assurance and warranty clauses in EPCI contracts • Thorough technical due diligence of hardware and software enabling the project • Retention of capable external advisors to examine risks
Environmental risk	• Risk of environmental damage, including pollution, radiation, noise, land use, damage to biodiversity, and climate change	• Relevant to all stakeholders, but directly affects residents and businesses located near the project site, who may be impacted	• Regulation and standards imposed by governments to ensure minimization of the environmental impact of projects • Rulemaking on environmental impact

Risk	Definition	Relevant to/borne by	Example allocation and mitigating measures
		by contamination, pollution, etc.	assessment and consensus building process • Clarification of the extent of liability borne by private stakeholders • Retention of capable external advisors to examine risks
Social risk	• Risk of negative social impact on labor, local communities, and other key stakeholders	• Relevant to all stakeholders, but directly affects people located near project sites, who may experience job losses or increased conflict within their communities	• Regulation and standards imposed by governments to ensure developers engage with the community throughout the project timeline • Rulemaking on social impact assessment and the consensus-building process • Clarification of the extent of liability borne by private stakeholders • Retention of capable external advisors to examine risks
Reputational risk	• Risk of damage to the project's reputation or public perception stemming from the level of social awareness about the energy transition	• Affects all project stakeholders • Can be a deal breaker due to material adverse effect	• Publicly commit to achieving energy transition • Transparent and stable policies • Government measures to enhance social acceptance of projects to avoid negative perceptions
Regulatory risk	• Risk of policy changes or unclear/inconsistent regulations impacting project viability	• Affects all project stakeholders • Can be a deal-breaker due to material adverse effect	• Use of sovereign risk insurance provided by development banks • Clarification of the extent of liability borne by private stakeholders
Political risk	• Risk of political instability, government intervention, or sovereign insolvency affecting the project		
Currency/interest rate risk	• Liquidity risks and foreign exchange and money market fluctuations affecting project stability	• Providers of capital, including lenders and equity investors (project sponsors)	• Use of currency insurance or swaps, when available • Financial market development

Exhibit 7: Example risk management for energy-related transition projects

ILLUSTRATIVE

Risk	Related to	Key public sector stakeholders: Governments	Key public sector stakeholders: Development Banks/ Public FIs/ ECAs	Key private sector stakeholders: Private FIs	Key private sector stakeholders: Sponsors	Key private sector stakeholders: Contractors	Key private sector stakeholders: Insurance Companies
		Example risk mitigation/ allocation methods					
Credit risk	Credit of project stakeholders (incl. offtakers, sponsors, contractors etc.)		Capacity building	Forming consortium Stringent due diligence of stakeholders			
Cash flow risk	Stability of revenue (price and volume) and costs (capex and opex)	Mechanism to secure revenue, recover costs and fair returns		Business model Financial structuring			
Development risk	Pre-construction activities (e.g., planning, permitting, stakeholder engagement)	Adequate legal frameworks and permitting		Project design Capable external advisors			
Construction risk	Delay or cost overrun of project construction			Rigid technical DD, warranty clause in contracts, lump sum & turnkey contracts, adequate insurance, capable external advisors, etc.			
Operational risk	Disruptions in operations due to thermal runaway, degradation of batteries, etc.						
Technological risk	Availability and maturity of technology necessary for the project						
Environmental risk	Uncertainties and negative impact on environment	Rulemaking including the extent of liabilities borne by the private sector, fostering social norms		Rigid environmental and social assessment, capable external advisors, project design, etc.			
Social risk	Negative effects to society (e.g., land acquisition, impact on local communities)						
Reputational risk	How initiatives are perceived by society and stakeholders						
Regulatory risk[1]	Inconsistency, incompleteness, and changes of regulatory frameworks	Clarifying the extent of liabilities borne by the private sector					
Political risk	Political uncertainty and volatility, sovereign solvency		Sovereign risk insurance				
Currency/ interest rate risk	Fluctuations of FX rate and base rate, and costs related to transferring of funds		Financial market development	Currency hedge, interest rate swap			

1. Regulatory risk is the key element for all other elements (e.g., development risk, currency risk)
2. National Promotional Banks, or institutions that use public funds to support the development of their own country's economy and businesses, not of other countries.

Source: CPI, Financing clean power: A risk-based approach to choosing ownership models and policy/finance instruments, September 2017, https://www.climatepolicyinitiative.org/publication/financing-clean-power-risk-based-approach-choosing-ownership-models-policy-finance-instruments/; Oxford Smith School, Rolling out renewables in the Global South: A developer perspective, November 2023, https://netzeroclimate.org/publications/rolling-out-renewables-in-the-global-south-a-developer-perspective/

As shown in Exhibit 7, key project risks can be allocated among various stakeholders, including governments, development banks, public FIs, export credit agencies, private FIs, project owners, contractors, and insurance companies. Allocating risks to appropriate stakeholders through means such as insurance products, guarantees, and well-designed contracts de-risks the project for lenders and can make projects bankable.

3.1.2 Technology List and Perspectives framework

When formulating large-scale projects, stakeholders have traditionally focused on risks directly linked to project cashflows, such as credit risk, construction risk, and operational risk. With the ever-growing focus on sustainability, environmental and social risk assessment has also become increasingly relevant for all parties. Adding to the complexity is the relatively nascent nature of transition technologies, which makes it challenging for stakeholders to share an understanding of the key risks in such projects. During the learning sessions, Study Group members discussed how the Technology List and Perspectives for Transition Finance in Asia (TLP)[7] published by ERIA in September 2022 could be used to assess technological, environmental, social, and other risks.

[7] Economic Research Institute for ASEAN and East Asia, Technology List and Perspectives for Transition Finance in Asia, September 2022, https://www.eria.org/research/technology-list-and-perspectives-for-transition-finance-in-asia/

Exhibit 8: Technology List and Perspectives for Transition Finance in Asia (TLP) framework

Taken from Technology List and Perspectives for Transition Finance in Asia, by ERIA

ILLUSTRATIVE

	Framework dimensions	Description	Reference
Technology characteristics	**Emissions impact**	GHG emissions intensity and/or reduction impact required to contribute to decarbonisation of a country or company	IPCCs, IEEJ
	Affordability	Estimated cost for technology	IEA, IEEJ, DEA, IRENA etc.
	Reliability/ maturity	Readiness for technology (e.g. commercial at scale, pilot, etc.).	Technology Readiness Level[1] by IEA (deep-dive page to follow)
Additional considerations	**Lock-in prevention considerations**	Eventual emissions reduction plan to reach zero or near-zero emissions.	EU Taxonomy and ASEAN Taxonomy for Sustainable Finance[2]
	DNSH considerations	'Do No Significant Harm' to environmental objectives other than GHG emissions.	
	Social considerations	Mitigate the negative effects of transition activities to the society, e.g. unemployment	

1. IEA, ETP Clean Energy Technology Guide
2. All the environmental objectives in EU taxonomy are covered in the 6 framework dimensions. All environmental objectives and essential criteria in ASEAN Taxonomy for Sustainable Finance are similarly covered in the 6 framework dimensions.

Exhibit 8 illustrates how the TLP facilitates discussion on transition projects by offering a common ground for FIs across Asia to make initial assessments of technological, environmental, and social risks. As explored in subsequent sections, transition projects come with unique technological, environmental, and social risks that need to be allocated to the appropriate stakeholders. Advisors who conduct thorough due diligence on the technological, environmental, and social impacts of projects can assist lenders in identifying and evaluating the extent of these risks.

The risk allocation process discussed in this section is inherently complex, given the involvement of multiple stakeholders and various layers of risk. Additionally, the key risks and mitigation strategies can vary significantly depending on the transition project in question. To facilitate a more concrete and detailed discussion, the Study Group focused on two major transition projects: CCUS and power storage systems. Subsequent sections dive into the specific risk management processes pertinent to each technology, providing a comprehensive analysis of the unique challenges and mitigation methods.

3.2 CASE STUDY 1: CCUS

3.2.1 CCUS: Overview and role in green transition

CCUS is a critical technology in energy transition, playing a key role in reducing carbon dioxide (CO_2) emissions from industrial and power generation sources. By capturing CO_2 at point-source facilities and either storing it underground or utilizing it in various applications, CCUS helps mitigate climate change and supports global efforts towards net-zero. This technology may be particularly vital for decarbonizing hard-to-abate sectors such as cement, steel, and chemical production, and for enabling the production of blue hydrogen.

> ***On the challenges of implementing CCUS projects:***
> *Since CO_2 inherently has no value, government support is crucial for making projects viable. Also, since project finance requires proper risk allocation, we need a system to cover risks that cannot be transferred out from project companies. However, many countries in ASEAN do not have a well-developed system.*
>
> *– an Asian commercial bank*

Despite their potential, CCUS projects are complex and involve significant financial and operational risks. Effective risk management is essential to address the various challenges associated with capturing, transporting, and storing CO_2. This section explores risk management and assessment processes specifically relevant to CCUS projects, providing a detailed analysis of the unique challenges and mitigation strategies needed for the successful deployment and operation of this pivotal technology.

Exhibit 9: CCUS process overview

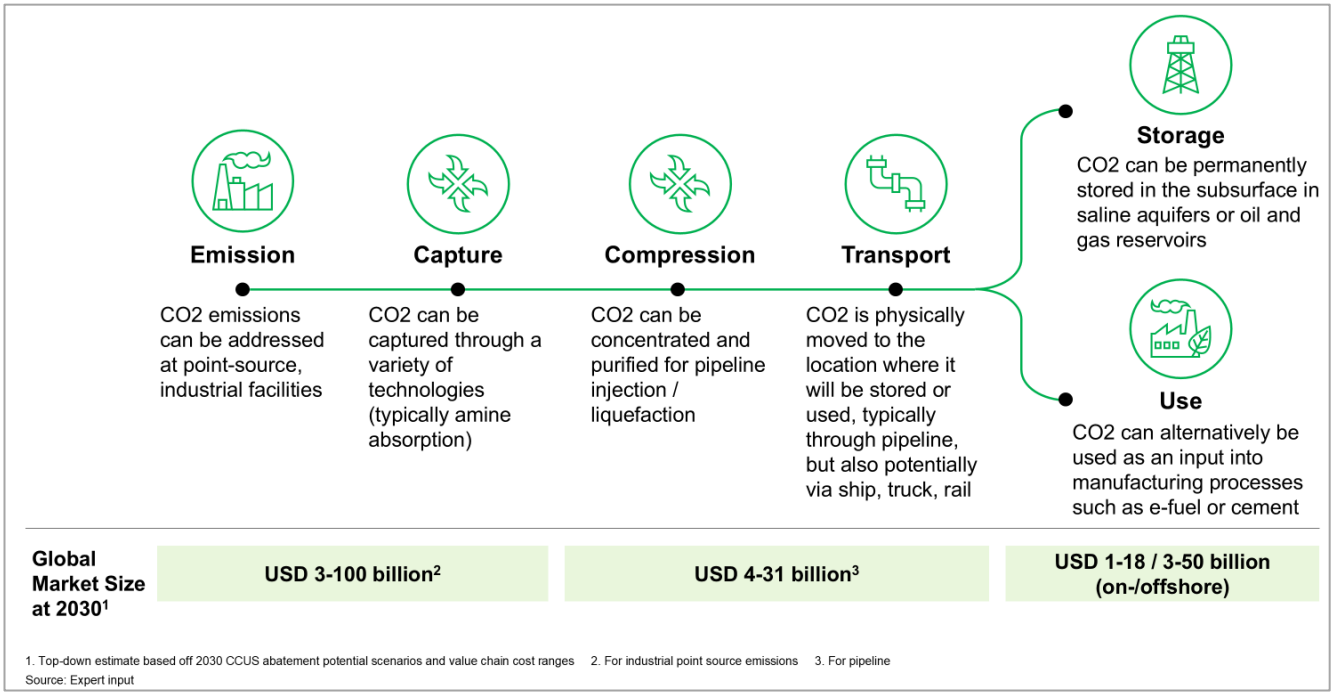


Exhibit 9 provides an overview of the five-step process involved in CCUS, which is crucial to address CO_2 emissions at point-source industrial facilities. The process begins with the emission of CO_2, which is then captured using various technologies, typically amine absorption. Once captured, the CO_2 is compressed into a concentrate and purified for pipeline injection or liquefaction. The next step involves transporting the CO_2 to the location where it will be stored or utilized, usually through pipelines, but also potentially via ship, truck, or rail. Finally, the CO_2 is either permanently stored in subsurface saline aquifers or oil and gas reservoirs, or used as an input in manufacturing processes such as e-fuel or cement production.

Exhibit 10: CO_2 emissions in Asia and relevance to CCUS

Point source	CO_2 emissions in Asia-Pacific Gt p.a.	CAGR since 2010 %	Share of abatement from CCUS under 1.5 °C, % 2030	2050	CCUS pathway
Power - Coal	7.5 (7,511.3)	4	3%	0%	Expected coal-fired generation growth in SE Asia implies short-run CCUS opportunities in certain countries.
Cement	1.3	1	13%	54%	After 2030, CCUS would need to be widespread to close the cement abatement gap, both through the retrofit of existing kilns and in new builds
Power - Gas	0.8	3	3%	18%	CCUS technologies are expected to abate remaining emissions from this generation, which is to provide flexibility to the grid (counterbalancing the intermittency of renewables)
Refining	0.5	-1	2%	4%	CCUS would be used in steam methane reforming to produce blue hydrogen that could then be used as an input to the O&G refining process
Chemicals	0.3	3	18%	38%	Application of CCUS to steam cracking furnaces would abate emissions from the combustion of either bioenergy or fossil fuels
Metals	0.3	6	2%	21%	CCUS would play a more significant role after 2030, in both existing and new blast furnace
Other Industry	0.1	2	-	-	

Source: European Commission, Joint Research Centre, EDGAR v6.0 Greenhouse Gas Emissions, January 2021, https://data.jrc.ec.europa.eu/dataset/97a67d67-c62e-4826-b873-9d972c4f670b

CCUS projects exhibit strong regional differences, largely influenced by the local availability of alternative decarbonization options, transportation, and storage resources. In Asia, as illustrated in Exhibit 10, the largest source of CO_2 emissions is coal-fired power generation, at 7.5 Gt per annum[8]. In terms of emissions abatement through CCUS, cement production, the second highest emitting sector, shows the largest potential since coal-fired power generation is projected to be gradually replaced by more sustainable generation technologies. CCUS would need to be widely adopted at cement production facilities, both through the retrofitting of existing kilns and in new builds, to close the abatement gap. Other sectors with high CCUS application potential in Asia are gas power generation, oil refining, chemicals, and metal manufacturing. During the learning session, a CCUS developer highlighted other carbon sources that CCUS is being applied to globally, including biomass generation, LNG liquefication, shipping, waste-to-energy plants, ceramics manufacturing, and hydrogen manufacturing.

> ***On the role financial institutions can play to foster the growth of CCUS:***
> *We often finance using our balance sheet, [but] we see that project financing, or forms of project financing, are going to play a key role in underwriting the risks involved in these types of projects, where other partners involved along the value chain do not have balance sheets strong enough to make this bankable, to understand and underwrite the risks, and bring the right partnerships together.*
> *So, there is this ability to come together and a need for cooperation on all fronts. Right from cost sharing to underwriting the commercial investment risks to changing the narrative or helping reorient local governments and regulators to our common cause.*
>
> *– a CCUS project developer*

CCUS projects are capital-intensive, requiring significant upfront investment similar to other large-scale infrastructure projects. This initial expenditure is gradually recovered during the operation phase, so securing debt financing is crucial. The complexity of CCUS projects, involving extensive

[8] European Commission, Joint Research Centre, EDGAR v6.0 Greenhouse Gas Emissions, January 2021, https://data.jrc.ec.europa.eu/dataset/97a67d67-c62e-4826-b873-9d972c4f670b

construction and the storing of CO_2 over a long period of time, necessitates careful risk management. Effective risk mitigation and allocation can foster discussions and partnerships among stakeholders, collectively mitigating risks and unlocking more CCUS projects. The Study Group learning sessions underscored how FIs can act as catalysts for the growth of CCUS projects by uniting stakeholders to collaboratively manage risks.

3.2.2 CCUS: Key risks and mitigation measures

This subsection elaborates on the key risks pertaining to CCUS projects: development, transport and storage, environmental, and social risks. These risks are uniquely relevant to CCUS and necessitate a collective approach for effective risk mitigation. Given the involvement of diverse stakeholders, including governments, insurance companies, and development banks, it is imperative that these entities collaborate to de-risk each identified challenge.

Development risk

Even for well-established technologies such as solar and wind power generation, debt financing is normally executed when projects progress to the construction phase. Additionally, many CCUS projects are currently at the pilot scale and require expansion to commercial scale in Asia. Operational improvements, further identification of cost reduction opportunities, and stronger enabling environments including carbon market are needed before CCUS projects can be implemented at scale. Nonetheless, thorough project development can reassure lenders and facilitate smoother procurement of financing in subsequent stages. As highlighted in Section 3.1, robust legal frameworks and comprehensive permitting regulations can mitigate development risk.

> ***On the importance of policy to enable CCUS projects:***
> *Public infrastructure is very important, because as an investor, you first want to make sure that the regulations are in place, that everything is clear, and there are no grey areas. Especially when it comes to transferring CO_2 from one country to another, the regulatory environment is something only governments can take care of. CCUS is important because of the volume [of CO_2 emissions abatement it enables]. But above all, it creates a potential premium. For example, if I were to import CO_2 from Japan, Korea, or Singapore, I would get a higher premium than I would from an Indonesian industry player. So, the government should make sure there are policy regulations to facilitate that sort of trade.*
> *– a development finance institution*

During the learning session, a CCUS project developer highlighted policies that could help foster the growth of CCUS projects:

- Carbon price: a price on emissions creates an economic incentive for emitters to implement CCUS. However, in the context of some developing Asian countries, affordability needs to be considered to make a just transition possible
- Capital loans/grants: some countries are offering public financial support to CCUS projects, including direct cash injections, green bonds, and grants. These support mechanisms cover various phases of project development, including research and development (R&D) and personnel training
- Contracts for difference/feed-in tariff: in addition to providing direct support to alleviate the high upfront financial burden of generating carbon-abated power, governments can also support investments by providing power purchase agreements to ensure pricing certainty

- Regulatory framework for storing CO_2: guidelines and regulations that outline permits, tenure, clarity on long term liability and closure planning, monitoring and measurement requirements, and a quantification protocol for injected CO_2 can facilitate the project development process

> ***On how regulatory support can help estimate project costs:***
> *In Asia, it would be great to see support for the first baby steps we are taking toward conducting feasibility studies. We would like to see Asian policymakers provide support for the early engineering work, so that we can estimate how much a project will cost, what technologies are required for a given location, and so on.*
>
> *– a CCUS project developer*

The development phase is fundamental, laying the groundwork for the entire project. As CCUS technology is still in its nascent stages, one of the bottlenecks is regulatory uncertainty. Clear and consistent government commitments can significantly reduce the perceived risks associated with CCUS projects, thereby attracting the necessary financing. This influx of investment can create a positive feedback loop. As more projects are undertaken, the skills and knowledge accumulated by stakeholders can further help de-risk CCUS initiatives, unlocking even more financing opportunities.

Transport and storage risk

A risk unique to CCUS projects is the potential for CO_2 leakage during its transport and storage. This leakage could undermine the environmental benefits of CCUS and pose safety hazards. Addressing the risk of CO_2 leakage is crucial for unlocking financing for CCUS projects. While no definitive solutions have been found to significantly reduce this risk, mitigation and allocation measures, such as government regulations, are evolving in some countries. For example, the Storage of Carbon Dioxide (Termination of Licences) Regulations in the United Kingdom (UK) stipulate that the responsibility for storage and prevention of CO_2 leakage shall be transferred from the operator to the state, provided certain conditions are met[9]. This transfer is designed to occur after a post-closure period, lasting 20 years in principle, during which the operator must conduct monitoring and verification to ensure that the stored CO_2 remains secure. Given the potential economic and social impacts of CO_2 leakage, it is crucial to clearly define the boundaries of risks that the private sector will assume.

While not directly addressing the risk of CO_2 leakage, some insurance products help mitigate the consequences of such events. A limited number of private insurance companies offer products that cover the costs associated with CO_2 leakage. For example, there are insurance policies that provide coverage for environmental damage and loss of revenue resulting from both sudden and gradual CO_2 leaks into the air, land, or water. These insurance solutions offer a safety net for operators and stakeholders involved in CCUS projects.

Environmental risk

As outlined in Section 3.1, environmental risks pertain to the potential for projects to cause ecological damage or fail to comply with local regulations. If these risks are not adequately addressed, projects may inflict harm on local communities or ecosystems and may be subject to fines or even termination. There are two key elements of environmental risk relevant to CCUS: (1) carbon lock-in and (2) the Do No Significant Harm (DNSH) principle.

[9] Legislation.gov.uk, The Storage of Carbon Dioxide (Termination of Licences) Regulations 2011, modified December 2023, https://www.legislation.gov.uk/uksi/2011/1483

(1) Carbon lock-in risk describes the likelihood that a particular technology or system becomes deeply embedded in high-carbon emission practices, thereby hindering the shift to low-carbon solutions. This situation arises when existing fossil fuel infrastructure or assets remain in operation, even though they could be replaced with lower-emission alternatives. This continued use of carbon-intensive resources delays or obstructs progress toward a more sustainable, low-carbon future.

    Lock-in risk is relevant to CCUS because it is frequently associated with carbon-emitting assets. While CCUS mitigates the amount of CO_2 released into the atmosphere, it does not address the fundamental source of emissions. Project developers may need to balance the efficacy of CCUS in reducing CO_2 emissions with the imperative to retire sources of emission as economically and socially viable alternatives become available.

(2) DNSH is a concept that originated within the framework of EU's environmental and sustainability policies[10]. It is a key component of the EU Taxonomy Regulation, which aims to guide investments toward sustainable activities and ensure that these activities do not cause significant harm to the environment or society.

    The TLP ties the DNSH principle to CCUS projects, identifying two key considerations to mitigate environmental risks. First, projects can protect ecosystems and biodiversity through adequate monitoring of stored CO_2, environmental viability assessments for construction activities, and proper waste management. Regulations can help establish benchmarks to ensure these mitigation measures effectively address risks. Second, CCUS stakeholders promote the transition to a circular economy by sourcing equipment from certified suppliers that minimize GHG emissions. They can also ensure that the captured CO_2 is utilized effectively, such as for construction materials, plastic and chemical raw materials, and fertilizers.

Given the complex and multifaceted impact of transition projects on the environment, governments are well-positioned to impose regulations and provide incentives such as financial backing for R&D to improve CO_2 recovery rates to mitigate and allocate risks. Governments can also commit to gradually decarbonizing the economy and prevent carbon lock-in by establishing transition pathways. These pathways could include metrics such as improvements in the efficacy of CCUS technology to increase CO_2 capture rates, the promotion of energy savings and greater efficiency in manufacturing processes and switching to raw materials from greener sources. By developing concrete action plans in consultation with industry players, governments can mitigate the risk of carbon lock-in and ensure that CCUS projects do not delay reaching the targets for net zero/carbon neutrality.

Social risk

Social risks encompass the potential negative impacts of projects on local communities, such as disruptions caused by the displacement of people. Another critical consideration is a project's impact on employment. Large-scale infrastructure such as CCUS typically requires labor for both construction and operation, leading to positive outcomes including job creation and capacity building.

The Study Group highlighted that, given the long duration of CCUS projects of over 20 years, project operators must ensure equitable hiring practices and provide comprehensive training programs. Governments can facilitate this by establishing guidelines on human resources practices, including fair hiring and robust training initiatives, as well as implementing monitoring mechanisms to ensure compliance and effectiveness.

[10] European Securities and Markets Authority, 'Do No Significant Harm' definitions and criteria across the EU Sustainable Finance framework, November 2023, https://www.esma.europa.eu/sites/default/files/2023-11/ESMA30-379-2281_Note_DNSH_definitions_and_criteria_across_the_EU_Sustainable_Finance_framework.pdf

> ***On the long-term social impact of CCUS projects:***
> *Social impact is quite important, because CCUS projects last a minimum of 20-25 years, and you would have people involved in this project for a long time. When we do cost evaluation of a project, we always consider the social impact, because we want to make sure that we create jobs, and that they are sustainable jobs.*
>
> *– a development finance institution*

In summary, the successful implementation of CCUS projects hinges on the effective mitigation of various risks. Each of the risks presents unique challenges that necessitate a collaborative approach among stakeholders. Government support is particularly critical in this collaborative effort. Supportive regulatory frameworks and financial incentives can significantly reduce the perceived risks associated with CCUS projects. Such support can not only attract the necessary financing, but also create a positive feedback loop where skills and knowledge accumulated by stakeholders further manage risks and unlock additional financing opportunities.

Potential actions relevant stakeholders may take: Managing CCUS risk	
Public sector	**Private sector**
Robust regulatory environment • Develop sound and stable regulatory environments that provide clear guidance for project developers • Key items to address: carbon pricing and trading; permitting and storing of CO_2 and associated long-term liabilities **Effective financial support** • Financially support R&D as well as the development of viable CCUS assets • Examples: capital loans/grants; offtake agreements for the purchasing of outputs from CCUS paired facilities such as electricity **Clear decarbonization pathways** • Address carbon lock-in risk by committing to clear and actionable transition pathways in consultation with industry players	**Optimal project development** • Ensure projects do not harm the environment by adequately monitoring stored CO_2 and conducting effective environmental due diligence • Address carbon lock-in risk by efficiently using captured CO_2 and considering alternative decarbonization technologies as they become available and economically and socially viable • Ensure equitable hiring practices and provide adequate training to create employment opportunities that enable capacity building for local communities **Effective risk allocation** • Ensure appropriate risk allocation among private sector stakeholders so that liability is effectively managed and controlled within each party's risk capacity • Develop insurance products that underwrite CCUS risks such as environmental damage and revenue loss

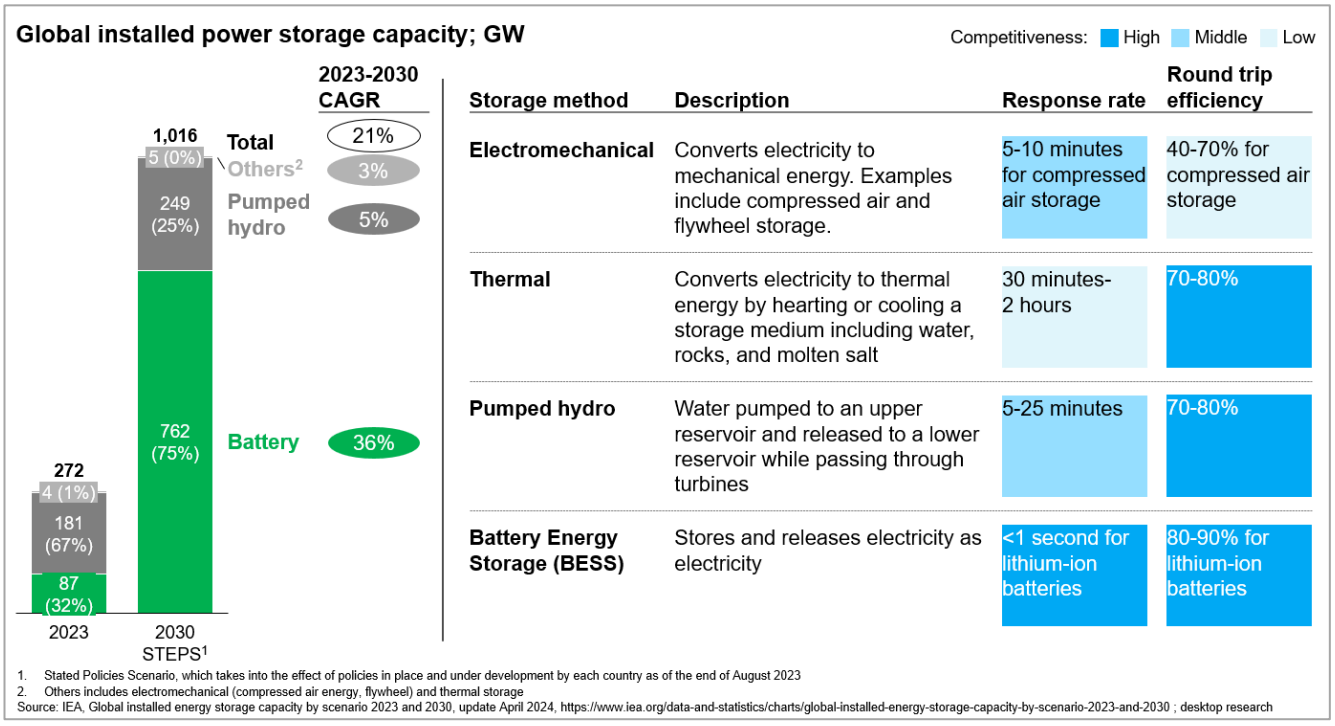
3.3 CASE STUDY 2: BATTERY ENERGY STORAGE SYSTEMS

3.3.1 BESS: Overview and role in green transition

Power storage systems play a crucial role in the transition to a greener grid by enhancing the reliability of intermittent renewable energy sources such as solar and wind power generation.

Intermittent renewable energy sources are not as reliable as traditional energy sources because their output depends on variable factors such as weather conditions and the time of day. The grid must balance energy generation and consumption to ensure supply always equals demand, as an imbalance can lead to issues such as blackouts, grid instability, and increased operational costs. As renewables become a larger part of the generation stack, power storage systems will become increasingly valuable to the grid for providing a stable power supply throughout the day.

Exhibit 11: Global power storage capacity by technology



1. Stated Policies Scenario, which takes into the effect of policies in place and under development by each country as of the end of August 2023
2. Others includes electromechanical (compressed air energy, flywheel) and thermal storage

Source: IEA, Global installed energy storage capacity by scenario 2023 and 2030, update April 2024, https://www.iea.org/data-and-statistics/charts/global-installed-energy-storage-capacity-by-scenario-2023-and-2030 ; desktop research

The various types of power storage are illustrated in Exhibit 11. According to the IEA, pumped hydro storage, which stores electricity by pumping water to an upper reservoir and releasing it back to the grid by running the water downstream through turbines, had the highest installed capacity globally as of 2023[11]. However, BESS are expected to become the predominant form of power storage by 2030.BESSs are particularly relevant for grid stabilization due to their technological advantages, such as quick sub-second response times and high round-trip efficiency.

BESSs are categorized into two main types: front-of-the-meter (FTM) and behind-the-meter (BTM). FTM BESSs are situated on the utility's side of the meter, discharging electricity directly to the grid for distribution to various demand sources. By contrast, BTM BESSs are located on the end user's side of the meter, providing stored electricity for the user's on-site use. BTM BESSs are beneficial to users such as hospitals, data centers, manufacturing facilities, and residents who need reliable energy storage for later use. Meanwhile, FTM BESSs are crucial for balancing the supply and demand of the grid, as they serve the grid as a whole. Consequently, the Study Group focused its discussion on FTM BESS.

[11] IEA, Global installed energy storage capacity by scenario 2023 and 2030, updated April 2024, https://www.iea.org/data-and-statistics/charts/global-installed-energy-storage-capacity-by-scenario-2023-and-2030

3.3.2 BESS: Key risks and allocation / mitigation measures

As with CCUS, BESSs require significant upfront capital expenditure and can only recover their investment gradually. Scaling BESSs can thus be facilitated by debt finance. This subsection examines the specific risks related to BESS projects: cashflow and operational risks. Collaboration among key stakeholders—including governments, insurance firms, and development banks—is crucial for effectively mitigating these challenges and, thereby, unlocking TF for BESS projects.

Cashflow risk

Cashflow risk is the risk of project cashflows failing to cover cash needs such as costs, debt obligations, and taxes. BESS projects, due to their complex revenue models, face significant cashflow risk. As BESSs can have multiple revenue streams, including kW, kWh, and ΔkW (kilowatt, kilowatt-hours, and delta/change in kilowatts), it is important to determine how to capture value from the various revenue streams to successfully implement a BESS project. Because the electricity market is largely shaped by regulatory frameworks, and many regulators are still in the process of establishing enabling environments for BESSs, business models for these systems are still evolving in many markets. Also, BESS cashflow and optimal operating models are heavily influenced by the specifications of the battery deployed, including battery life, round trip efficiency, and degradation.

> ***On the complexity of BESS economics:***
> *Our analysis shows that, in terms of the characteristics of batteries and assets on the ground, [things have evolved] even in the last three or five years. We were initially modeling batteries with 10-year warranty periods, but that has already gone up to 20 years. This makes a big difference for battery economics. We are seeing improvements. Then there are things such as degradation and other capabilities. Even if you just take the asset parameters, it is a complex market, and there are a number of things that move battery economics.*
>
> *– an advisory firm*

Exhibit 12: Major revenue sources of utility scale battery storage systems

Elements	Description	Cash inflow predictability
Capacity payments	• **Payments for capacity (watts), or the potential to provide electricity in the future** • Typically contracted in advance to secure future grid capacity	• **High** for long term (~20 years) contracts made before BESS investment decisions • **Medium** for short term (~1 year) contracts made 3-4 years in advance
Ancillary services	• **Short term charge/discharge of power to stabilize grid frequency. BESS is rewarded for the ability to balance the grid (Δwatt hours)** • Examples include Balancing Mechanism where capacity is secured at least 30 minutes ahead of time, and Frequency Response where capacity is secured for emergency stabilization of the grid (<30 minutes)	• **High** for long term contracts (~5 years) secured a year or more ahead of time • **Medium** for short-term capacity contracts Frequency response is an obligation and is not monetarily rewarded in some markets
Arbitrage (Wholesale market)	• **Buying and selling of electricity (watt hours) across day-ahead and intra-day wholesale markets** • Leveraging of electricity price differentials	• **Low** as revenue is exposed to market risk and is not secured in advance

Source: Desktop research, expert interviews

As illustrated by Exhibit 12, BESSs can stack multiple forms of revenue, including from capacity payments and the sale of electricity and ancillary services. Depending on the structure of the electricity market, these products can be sold through competitive markets that typically involve a bidding process, or through bilateral offtake contracts. Note also that BESSs must purchase electricity from the grid, preferably during the day when prices are low, before it can sell any electricity. The multifaceted revenue structure of BESSs complicates the projection of project cashflows, making financers, who prefer stable and predictable cash flows, wary. Consequently, there is limited appetite among commercial lenders for extending loans for BESS projects, particularly those without offtake agreements and exposed to market risk.

Exhibit 13: Major FTM BESS finance deals in South and Southeast Asia

NON-EXHAUSTIVE

BESS with ancillary services offtake agreements

BESS paired with solar/ wind assets with PPAs

Project	Location	Developer	Debt financing	Project type
ReNew India Round the Clock Wind, Solar & Battery Project		ReNew Power (51%), Mitsui & Co (49%)	~USD1 billion loan by 12 banks led by Rabobank	
SMGP Portfolio of 32 BESS Projects		San Miguel Global Power Holdings	~USD 720 million loan by China Banking Corp., Bank of Commerce, and BDO Unibank	
GULF Renewable Power Project		Gulf Renewable Energy	~USD 300 million loan by ADB and AIIB	
Southern Thailand Wind Power and BESS Project		BCPG Public Company	~USD 14 million loan by ADB and Kasikornbank and ~ USD 5 million in concessional funds	

Source: Refinitiv database; DBS, "ReNew bets on round-the-clock hybrid", July 2023, https://www.dbs.com.sg/corporate/insights/renew-bets-on-round-the-clock-hybrid ; Reuters, "India's ReNew Power secures $1 bln loan from 12 global lenders", August 2022, https://www.reuters.com/business/energy/indias-renew-power-secures-1-bln-loan-12-global-lenders-2022-08-17/ ; SMC Global Power Holdings Corp., Prospectus for Fixed Rate Bonds, May 2022, https://www.sec.gov.ph/wp-content/uploads/2022/06/2022RS_SMCGP-Preliminary-Prospectus.pdf; ADB, "Thailand : Gulf Solar and Solar with Battery Energy Storage Systems Project", accessed August 2024, https://www.adb.org/projects/57173-001/main

BESS cashflow risk can be mitigated by securing long-term agreements. As Exhibit 13 shows, in South and Southeast Asia, lenders have extended financing to BESS projects that have secured predictable revenue streams. In the Philippines, lenders have provided financing to a portfolio of standalone BESS assets, some of which have signed five-year Ancillary Service Procurement Agreements with the national grid operators[12]. In India and Thailand, BESS that are paired with solar and/or wind assets have been financed with the help of power purchase agreements (PPAs), some of which are 25 years long, for electricity generated using renewable energy assets[13].

[12] SMC Global Power Holdings Corp., Prospectus for Fixed Rate Bonds, May 2022, https://www.sec.gov.ph/wp-content/uploads/2022/06/2022RS_SMCGP-Preliminary-Prospectus.pdf

[13] DBS, "ReNew bets on round-the-clock hybrid", July 2023, https://www.dbs.com.sg/corporate/insights/renew-bets-on-round-the-clock-hybrid; Gulf Energy Development Public Company Limited, "GULF Share Profit Q3 2023", November 2023, https://www.gulf.co.th/en/news/nov_2023/GULF-Share-Profit-Q3-2023.php

> ***On the government's role in catalyzing BESS investments:***
> *Government subsidies, in addition to evolving market structures, often drive the initial deployment of BESS assets in a country.*
>
> *– an advisory firm*

Governments can broaden BESS revenue model options through regulations and financial support that provide long-term cashflow predictability. Recently, governments across the globe have begun to offer financial incentives via capacity payments. For example, starting December 2024, Italy's Electricity Storage Capacity Procurement Mechanism plans to feature an auction system where BESS operators bid for 12-14 year fixed-price capacity contracts with the grid operator as the counterpart[14]. In Australia, the government provides a revenue corridor for projects through the Capacity Investment Scheme, which supports projects when their revenue falls below a floor but requires them to forfeit excess revenue above a ceiling[15]. Japan's Long-Term Decarbonization capacity payment auction system, introduced in 2024, allows BESS operators to bid for 20-year contracts covering all fixed operational and capital expenditures[16]. In exchange for having all fixed costs covered, BESS projects must forfeit 90-95% of profits (revenue minus variable costs) earned by selling electricity in the wholesale and ancillary services markets.

Operational risk

Operational risks refer to the potential challenges and uncertainties related to the day-to-day operation, management, and maintenance of projects. BESS projects face several unique operational risks that can be mitigated through a combination of enhanced project design, insurance, and regulation.

A key operational risk for BESS is the suboptimal use of batteries due to the difficulty of forecasting electricity and capacity price fluctuations. This can result in purchasing or selling electricity at unfavorable times and missing revenue opportunities across wholesale, capacity, and ancillary service markets. Additionally, the impact on battery performance, especially battery degradation, should be carefully considered. One way to mitigate this risk is through battery management systems optimized with AI and advanced analytics, which can improve forecasting and bidding strategies. Market risk insurance can additionally protect against unexpected price volatility, while government offtake agreements for capacity or ancillary services can provide revenue visibility.

Another significant risk is thermal runaway, a rapid heating feedback loop caused by damaged batteries releasing heat and gas, leading to revenue loss and additional costs for battery replacement. Mitigating this risk involves implementing adequate temperature control with thermal insulating materials and monitoring battery health. Insurance measures such as property insurance for fire damage and business interruption insurance for project downtime are also effective mitigation tools from the perspective of lenders and developers. During a study group learning session, an insurance advisor discussed the technicalities of thermal runaway risk and outlined specific insurance clauses designed to address these risks. The advisor also explained that sharing risks with battery manufacturers through extended warranties is a viable option. Governments can further mitigate

[14] TERNA S.p.A., "Mercato a termine degli stoccaggi (MACSE)", accessed July 2024, https://www.terna.it/it/sistema-elettrico/mercato-termine-stoccaggi

[15] Australian Government, Department of Climate Change, Energy, the Environment and Water, "Capacity Investment Scheme", accessed July 2024, https://www.dcceew.gov.au/energy/renewable/capacity-investment-scheme

[16] Organization for Cross-regional Coordination of Transmission Operators (OCCTO), Japan, "Chouki datsutanso dengen ookushon wo shirou!", accessed July 2024, https://www.occto.or.jp/capacity-market/decarbonation_know

thermal runaway risk by implementing safety standards aligned with technological developments and mandating pre-operation tests for BESS.

Battery degradation, or the gradual decline in a battery's ability to store and deliver electricity, also poses a significant risk. This reduction in capacity, power, range, and efficiency can directly impact project revenues. Mitigation strategies include optimizing charging cycles to avoid frequent deep charging/discharging and extreme temperatures. Including a performance warranty in a long-term service agreement is one option to transfer risks to the contractor. Battery augmentation also improves BESS performance, but needs to be balanced with project profitability. Further, performance guarantee insurance can be used to protect revenues in the event of battery underperformance.

Mitigating and allocating risks is crucial for scaling and securing financing for BESS projects. Cashflow risk can be reduced through long-term agreements and regulatory frameworks that ensure revenue predictability, supported by government subsidies and structured market mechanisms. Operational risks such as suboptimal battery use, thermal runaway, and battery degradation can be managed with advanced battery management systems, insurance, and stringent safety standards. A coordinated effort among stakeholders, backed by robust government policies and financial incentives, is essential to manage BESS project risks and ensure their successful implementation.

Potential actions relevant stakeholders may take: Managing BESS risk	
Public sector	**Private sector**
Robust regulatory environment ● Establish enabling environments for BESS through sound regulations that provide clarity on appropriate revenue models, including developing robust electricity and capacity markets, or through facilitating long term agreements ● Develop safety standards to provide guidance for project developers on de-risking mechanisms **Effective financial support** ● Financially support R&D and the development of viable BESS assets ● Examples: financial support in the form of long-term offtake agreements, tax credits, direct capex support	**Optimal project development and operations** ● Reduce project risk through the design of safe assets, such as leaving enough space between battery units to reduce thermal runaway risk ● Effectively utilize batteries through battery management systems and optimized battery charge and discharge cycles **Effective risk allocation** ● Develop insurance and guarantee products that underwrite BESS risks such as thermal runaway risk, electricity price volatility, and battery degradation ● Utilize performance warranties in long-term service agreements

4 COLLABORATION WITH BROADER STAKEHOLDERS

TF projects involve numerous stakeholders, each of whom plays a distinct role when it comes to risk allocation and mitigation. Cooperation between the public and private sectors is essential to achieve effective risk management. For example, regulators are instrumental in creating enabling environments that enhance risk management, while insurance and guarantee providers offer products specifically designed to address particular risks. Advisors provide technical advice that improves the quality and speed of the risk assessment processes. The ATF SG made remarkable progress in 2024 by incorporating the perspectives of advisors and insurance/guarantee providers for the first time inviting them to SG discussions as guest speakers. This inclusion enhanced the multi-faceted quality of SG discussions. This chapter examines the roles of the key stakeholders in detail.

4.1 REGULATORS

Public support does not only mean financial support, such as subsidies and blended finance, which is detailed in Chapter 5. Non-financial policy support can also serve as a foundation of project feasibility. Non-financial support, including commitment to energy transition, transparent and stable regulations, institutional mechanisms to secure revenues, and interoperable frameworks, are essential foundations to make transition projects feasible. A key form of non-financial support from the government is regulation. Supportive regulation can mitigate project risks through various mechanisms, including ensuring stable and regulated revenue streams, streamlining the permitting processes, and facilitating cross-border capital and trade flows. Regulators play a developing stable market ecosystems and providing long-term predictability.

Regulation is particularly effective in mitigating the following key risks:

- **Cashflow risk:** Regulation can enhance the market-creation process for new technologies by reducing the uncertainty of cashflows generated from such projects. For instance, establishing a robust marketplace for carbon emissions trading can support the growth of CCUS by creating an additional revenue stream beyond offtake contracts, with a potential upside. Similarly, BESS projects are often developed in jurisdictions with regulatory frameworks that ensure revenue predictability, supported by government subsidies and structured market mechanisms.
- **Development risk:** Standardizing and streamlining key processes, such as permitting, can reduce the risk of projects getting derailed during the development phase. Beyond establishing efficient regulatory frameworks within jurisdictions, regulators can also work across borders by harmonizing development frameworks to facilitate large-scale, multinational, or regional projects. Additionally, policies such as R&D support for new technologies expedite the stabilization of those technologies, thereby reducing development risk.
- **Regulatory risk:** Legal and long-term regulatory stability significantly supports the structuring of projects, as fluctuating regulations decrease certainty, making it difficult for stakeholders to align on the design and implementation of projects. This is particularly relevant for transition projects, which often span several decades. Further, regulators can play a positive role by establishing clear net-zero pathways and outlining climate and economic commitments that are not changed frequently. Committing to regional decarbonization requirements independent of the political climate of each country can also reduce the risk of regulatory changes by subsequent administrations.

The Study Group examined existing regulations that enhance the viability of transition projects. One notable example is from the EU, where a well-regulated emissions trading system reduces cashflow risk by increasing the earning potential of projects through carbon credit trading[17]. This system, paired

[17] European Commission, “EU Emissions Trading System (EU ETS)”, accessed July 2024, https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en

with a cap on GHG emissions, incentivizes investments in decarbonization technologies. Another example is from Singapore, where the government has established a regulatory sandbox, a controlled environment where new technologies can be tested under a relaxed regulatory framework[18]. This mechanism mitigates construction and operating risks by ensuring that appropriate regulatory guidelines are in place by the time the technology is ready for scaled commercial operations.

While discussions around regulations often focus on central governments, the Study Group also highlighted the importance of local governments in reflecting more granular, project-specific factors in regulations. It is important to assess the extent to which central governments can design and implement policies and determine how much responsibility local governments should assume.

> ***On the role of sub-national governments in enhancing regulatory support:***
> *Local [sub-national] governments play a key role because they are the ones at the forefront of the fight against climate change. Since they take the biggest hit, they are also better positioned to understand needs. We need to understand the roles and responsibilities of local governments within a national context.*
> *In many cases, local governments are unable to either borrow or invest. There are many considerations to factor in when looking at a project. So, local governments need to establish and pledge to undertake dialogues on the level of autonomy they can have – how they can either work with the central government to reach pockets of private investment or push for changes in policy to allow them to do it independently. This is something we view as the main hurdle.*
>
> *– a commercial bank in Asia*

By ensuring transparency, stability, and predictability of investment climates, regulators can significantly reduce risks for investors. Clear and well-defined rules and regulations are favored by lenders as well, as they function as risk mitigation tools that enhance the predictability of project cashflows. Overall, through the implementation of predictable, robust, and timely rules and guidelines, regulators can improve the bankability of transition projects, thereby fostering the growth of the sector as a whole.

[18] Energy Market Authority of Singapore, “Regulatory Sandbox”, accessed July 2024, https://www.ema.gov.sg/regulations-licences/regulations/policies-frameworks/regulatory-sandbox

Potential actions relevant stakeholders may take: Non-financial support of regulators	
Public sector	**Private sector**
Transparent and stable regulatory environment ● Provides clear guidance on regulations, and avoids frequent unpredictable changes to foster investor confidence ● Outlines country/sector-wide net-zero pathways to communicate transition projects that are needed in each jurisdiction, thus guiding project developers in creating their own transition plans ● Standardizes and streamlines processes such as permitting to provide clarity on project development and operations **Efficient markets of regulated assets** ● Develops robust marketplaces for regulated assets such as emissions and electricity that incentivize investments in transition assets **Interoperability across jurisdictions** ● Works across jurisdictions, both internationally and among various subnational governments, to harmonize project development frameworks and to facilitate multinational or multiregional projects	**N/A**

4.2 INSURANCE AND GUARANTE PROVIDERS

4.2.1 Insurance and guarantees as risk allocation tools

In the evolving landscape of TF, insurance and guarantee products have emerged as critical tools for allocating risks among stakeholders. These financial instruments are designed to offer a safety net for investors and other stakeholders, ensuring that potential pitfalls do not derail projects. As the complexity and scale of transition projects grow, so too does the need for robust risk allocation solutions. Today, a variety of insurance products and guarantees are available, ranging from sustainability-related guarantees to specific insurance policies tailored for technologies such as hydrogen production and CCUS.

> ***On the role of insurance and guarantees in unlocking TF:***
> *Anyone who has been in the finance business knows that the biggest issue is always risk and how to mitigate it. In the transition technology sector, especially, the norms are very different from those in conventional sectors. Therefore, insurance and de-risking serve as assurance for lenders – when the risk is taken away, the project becomes financeable.*
> *– a knowledge contributor*

Insurance and guarantee products are particularly useful in addressing several key risks that can impede the success of transition projects and are effective tools for public-private cooperation. For

example, by separating risk taking from financing, public liability guarantees allow private capital to be leveraged while covering risks beyond the appetite and capacity of the private sector. Another example is political risk insurance, which can mitigate political risks for financiers by insuring against currency transfer, expropriation, and war and civil disobedience risks, providing stability and confidence for investors. This risk allocation mechanism is essential for attracting private capital into projects that may otherwise be deemed too risky.

Insurance and guarantees also play a crucial role in ensuring that specific risks related to project execution and technology deployment are managed effectively. For instance, insurance policies can cover the technological and operational risks associated with deploying emerging transition technologies. This includes protection against potential failures or underperformance of the technology, which can have significant financial repercussions.

Currency risk, meanwhile, can be hedged with risk allocation instruments such as exchange rate guarantees. This is particularly crucial in emerging markets, where projects have had to be re-negotiated following larger than expected volatility in interest rates and/or exchange rates. Currency risk is especially relevant in the case of projects where financing is obtained in foreign currencies, typically hard currencies, but revenue flows are generated in local currencies.

4.2.2 Challenges and opportunities for insurance and guarantees

The insurance sector is continually evolving to address challenges and develop innovative solutions tailored to the unique needs of transition projects. One significant challenge is the lack of comprehensive data with sufficient historical records. Accurate risk assessment and pricing depend heavily on data, yet data collection remains a hurdle in certain markets. By enhancing data collection and promoting transparency, risk allocation instrument providers can improve their ability to price risk accurately. Encouraging open data sharing among project owners and equipment manufacturers can accelerate this process.

Another challenge lies in underwriting risks associated with nascent technologies that lack historical quantification. As these technologies and their associated risks evolve rapidly, insurers often struggle to keep pace. To address this issue, insurers can collaborate to establish industry standards by partnering with academics to gain a deeper understanding of new technologies, their risks, and risk mitigation methods. Collaborative efforts can also lead to a consensus on policy design elements such as warranty periods, policy wording, and limitations, ensuring they are acceptable across the industry.

Case Example 1: MIGA's Political Risk Insurance[19]
MIGA explains on its website that political risks stem from actions of governments and are challenging for project stakeholders including lenders and project developers to predict. Political risk here refers to non-commercial risks that arise when institutions in one country engage in projects in another. When lenders and project developers are unfamiliar with the conditions in another country, they may hesitate to engage in projects there. This hesitation is primarily due to the higher perceived risks associated with unfamiliar markets compared to home markets. Political risk insurance mitigates political risk from the perspective of project stakeholders by helping them avoid potential losses or reimbursing them in case of a covered loss related to political causes. The insurance is relevant for both project owners and lenders, as it can cover the net book value of equity investments, as well as the outstanding principal and unpaid interest of loans. Although political risk insurance is not unique to the Multilateral Investment Guarantee Agency (MIGA), MIGA's strength lies in its ability to cover complex projects in high-risk emerging market countries. One example of a covered risk is expropriation, which includes actions by governments that reduce or eliminate ownership or control of an investment. Expropriation can occur through outright nationalization and confiscation or gradually over time through a series of government acts. Another covered risk is currency inconvertibility and transfer restriction, which limits project owners' ability to convert local currency to hard currency and/or transfer funds outside the host country. MIGA's political risk insurance does not cover currency depreciation. Breach of contract is another significant risk covered by MIGA, occurring when a government fails to honor its contractual obligations. An example of a breach of contract by governments relevant for transition projects is a breach of power purchase agreements, where the government acts as an offtaker to purchase electricity generated by the project. A final example of a covered risk is war and civil disturbance, which includes revolution, insurrection, coups d'état, sabotage, and terrorism. MIGA can cover damages to tangible assets and total business interruptions when operations essential to projects become inoperable. This coverage extends to actions within the project host country directed towards the host government, as well as actions aimed at foreign governments or foreign investments. Both complete and temporary business interruptions can be included in the coverage.

4.3 ADVISORS

4.3.1 Advisors' role in transition projects

Due to the complex and evolving nature of transition projects, advisors can play a key role in enhancing project feasibility by advising stakeholders including project developers, contractors and lenders in project design and due diligence. This subsection outlines how advisors provide crucial support to projects in three aspects: (1) project economics, (2) engineering and technical considerations, and (3) insurance procurement.

(1) Project economics

Market advisory firms play an essential role in assisting developers with project structuring. Leveraging their up-to-date knowledge of regulatory changes and market structures, these firms provide expertise crucial for effective project structuring that balances costs and returns. Moreover, international advisors contribute best practices from multiple markets, enabling project designs optimally tailored to specific needs.

[19] MIGA website, accessed August 2024, https://www.miga.org/

A key service advisors provide is modeling the economics of transition projects to mitigate cash flow risks. When designing a transition asset project, numerous variables can impact project economics and bankability. For instance, the design of a BESS project involves several critical factors, including the choice of battery technology, battery specifications such as round-trip efficiency, installed battery capacity, project lifespan, and the frequency of charging and discharging. Advisors develop detailed models to help project developers understand the various cash flow scenarios that arise based on these design choices, thereby enabling projects to meet the desired risk-return profiles of lenders and sponsors.

Advisors are uniquely positioned to provide value to projects as they are involved in project design and implementation beyond the industrial or geographic scope of typical developers. This point was echoed by a market advisor during a Study Group session, who emphasized that advisors accumulate knowledge and expertise by engaging with multiple projects and markets. They also collaborate with a diverse array of stakeholders, including governments, regulators, utilities, project developers, infrastructure funds, and banks. Beyond providing technical expertise on specific projects or portfolios, advisors also enhance the industry's knowledge base by publishing research reports.

(2) Engineering and technical considerations

In addition to project economics, advisors can play a key role in designing the technical aspects of transition projects. Given that transition technologies are often nascent and continually evolving, project developers frequently lean on advisors for their expertise. Technical considerations for transition projects encompass construction, safety, site layout, and the procurement of equipment and materials, all while managing costs efficiently.

Another key area where the technical expertise of advisors is highly valued is in mitigating environmental and social risks. For instance, sourcing of conflict minerals is a key issue in the BESS industry. A Study Group participant shared that project developers can work with advisors to ensure responsible procurement by safely sourcing raw materials using globally recognized certifications. Advisors can also assist in identifying relevant environmental and social risks through due diligence, building on their expertise to ensure projects meet the requirements of lenders and regulators.

Similar to the design of project economics, the unique positioning of advisors, who work with a multitude of project developers across various markets, is invaluable in the technical design of projects. Advisors can guide developers on how their projects can integrate into the broader landscape, such as fitting into supply chains or aligning with industry and geographic-wide initiatives and pathways.

Moreover, advisors build on their extensive experience from working on multiple projects by publishing technical insights and setting industry-wide benchmarks. They can elevate entire industries through wide-reaching initiatives, bringing together multiple stakeholders to enhance collective expertise and performance. This collaborative approach not only boosts individual projects but also strengthens the industry as a whole.

(3) Insurance procurement

Transition projects often involve emerging technologies where project operators may not yet have extensive expertise. Insurance is an integral part of transition projects, as it serves to allocate key risks away from the insured. When procuring insurance, advisors with expertise in procurement and the specific language of insurance clauses can assist in securing adequate coverage. Optimizing insurance procurement, in turn facilitates risk allocation, thereby enhancing the bankability of projects.

Advisors can guide both project sponsors and lenders on insurance and risk allocation matters. Key support provided to project sponsors includes risk assessment and risk management by designing

and structuring insurance programs. With lenders, advisors are often involved in the review process, ensuring that risks are efficiently allocated, transferred, and mitigated through insurance. This process is often conducted in conjunction with the project sponsors and their advisors.

> ***On the complexity of insurance clauses for BESS projects:***
> *As BESS is still an evolving sector, unlike conventional technology, there have been large historical losses in the sector, making underwriters much more wary of assuming risk. They are still in the process of adopting technical underwriting provisions.*
>
> *– an insurance advisor*

During a Study Group discussion, an insurance advisor highlighted the complexity of BESS insurance related to thermal runaway risk, a key risk that was identified in Section 3.3.2. Advisors work with project developers on key factors that insurers examine when assessing thermal runaway risk, including project design, the track record of equipment providers, adherence to fire protection systems meeting internationally accepted standards, warranties available, and spare part management. For example, battery spacing directly influences the calculation of maximum loss exposure, as projects with insufficient spacing may be assessed as having a maximum loss exposure encompassing the entire project site rather than a portion of the BESS installation. Advisors can also provide guidance on designing optimal operating conditions for batteries, recommending installations away from harsh environments characterized by high humidity and temperature fluctuations, commonly found in mountainous or coastal regions.

An advisor who joined a Study Group session shared that the variable climatic conditions in some regions in Asia limit the availability of insurance coverage, restricting the growth of transition projects. For example, there is relatively limited capacity for natural catastrophe insurance in the Philippines due to the high risk of natural disasters. In such areas, operators must take additional measures to ensure that projects can withstand natural disasters such as earthquakes, typhoons, and flooding. Advisors provide probabilistic studies on natural catastrophe exposure to help establish required policy limits.

Another technical aspect where experienced insurance advisors can offer substantial value is in the procurement of suitable batteries. A learning session participant shared that insurance companies often maintain dynamic lists of preferred and less preferred manufacturers, which are updated based on each manufacturer's track record, including experience with large-scale installations, historical losses on battery fleets, and warranties offered. Advisors with extensive project and regional experience can navigate such complexities to ensure the selection of batteries that align with insurers' preferences.

4.3.2 Challenges and opportunities for advisors

A key challenge identified by a Study Group participant in enhancing advisor capacity and expanding coverage of more technologies and geographies is the lack of data and the suboptimal quality of available data. This limitation can also restrict the granularity or breadth of the advice provided. To enable advisors to have a greater impact and to catalyze growth in TF, increased data transparency from stakeholders such as governments, grid operators, and project developers would be beneficial.

An insurance advisor noted that the pool of capable and experienced advisors in the finance space is both concentrated and limited. This scarcity is evident on both the project sponsor side and the lender side, particularly in the Asian context. Given the numerous local factors that need to be addressed to

adequately identify and allocate transition project risks, advisors who can blend international perspectives and experience with local contexts are crucial for the growth of the ecosystem in the region. International advisors can play a key role in training and retaining local talent, thereby enhancing the entire project financing ecosystem.

As outlined above, technical expertise is crucial for enhancing the risk allocation process of transition projects through insurance procurement, particularly given the nascent and evolving nature of transition technologies. Advisors play an essential role in ensuring that key risks are effectively allocated to insurers through appropriate insurance strategies in a comprehensive and cost-efficient manner.

<table>
<tr><th colspan="2">Potential actions relevant stakeholders may take:
Enabling insurance and advisory support</th></tr>
<tr><th>Public sector</th><th>Private sector</th></tr>
<tr><td>Comprehensive data collection and sharing
Facilitate the sharing of data among players including grid operators, project developers, and financiers to foster the development of effective insurance/ guarantees and advisory services
Effective risk underwriting
MDBs can provide efficient political risk insurance by working closely with both governments and the private sector</td><td>Comprehensive data collection and sharing
Collect and share useful data among stakeholders including project owners and financiers to inform the risk quantification process for both insurers and advisors
Industry wide collaboration
Establish industry wide standards or norms by partnering with various players and academics to align on consensus and increase replicability across projects
Effective capability building
Grow the pool of capable insurers and advisors that understand the local context through training and retention of local talent and knowledge sharing</td></tr>
</table>

5 FINANCING INSTRUMENTS FOR RISK ALLOCATION

TF projects involve a multitude of risks, as outlined in Section 2.1. While the private sector is crucial for the efficient scaling of such projects, particularly those involving nascent technologies and in markets with limited precedents, the private sector alone cannot absorb all associated risks. The public sector, including governments and development finance institutions, are called upon to assume risks that exceed the private sector's risk tolerance. In this context, a key tool the public sector can deploy is blended finance instruments, which enhance project bankability to mobilize private sector investment by reallocating risks from the private to the public sector.

This chapter explores blended finance through the lens of TF, delving into its various definitions and instruments and looking at examples of facilities in Asia. It also assesses the key challenges to scaling blended finance in Asia and discusses the implications in terms of how various stakeholders can address these challenges. During discussions, Study Group members expressed optimism for the growth of blended finance, especially with increased support from the public sector.

5.1 IMPORTANCE OF BLENDED FINANCE

5.1.1 Blended finance as a risk allocation tool to unlock transition finance

The definition of blended finance varies slightly by organization, but it generally encompasses the strategic use of public or philanthropic funds to mobilize private sector investment.

Exhibit 14: Definition of blended finance by various institutions

Key difference

Definition summary	Institutional source	Sources to mobilize additional finance		Additionally mobilized finance	
		Finance type	Provider	Finance type	Provider
Broad scope of finance type of sources / leveraged outputs	OECD	**All development finance** including non-financial inputs	Public/philanthropic or private source	Additional market-rate investment for SDGs	Public or private sources
Limited scope of finance type of sources	DFI Working Group on Blended Concessional Finance for Private Sector Projects	**Concessional** development finance (excluding grants)	Public/philanthropic or private sources	Additional market-rate investment for private sector development and SDGs	DFIs and/or private sources
Limited scope of finance type and provider of sources / outputs provider	CONVERGENCE BLENDING GLOBAL FINANCE	**Concessional** development finance (including grants)	**Public/ philanthropic sources**	Additional investment for SDGs in emerging or frontier markets	**Private sources**
Narrow scope of finance type of source / leveraged outputs		**Grant finance**	**EU**	Additional investment	International finance institutions (IFIs) and/or private investors

Source: OECD, Core concepts in blended finance, February 2021, https://www.oecd.org/en/publications/2021/02/core-concepts-in-blended-finance_c7f8aa98.html

As illustrated in Exhibit 14, sources of public or philanthropic funds may include development finance institutions, governments, and foundations. These institutions can deploy funds in various forms, including concessional loans, equity, and grants, or provide non-financial support, including technical assistance. The outcome may manifest as additional market-rate funding from the private sector alone or a combination of public and private financiers. Regardless of its form, the primary role of blended finance is to attract private sector funding by reallocating some of the risks to the public sector.

> ***On the importance of blended finance:***
> *Blended finance has enormous potential for Asia's energy sector because it can be used to mitigate risks that prevent capital from flowing to where it is most needed*
> *– a private sector commercial bank*

Blended finance is enabled by the public and philanthropic sectors' capacity to absorb risks that exceed the private sector's risk tolerance levels. Private sector participants, including project sponsors, insurers, financers, service contractors, and off takers, typically have lower risk tolerance due to their profit-driven objectives. These private entities are mandated to achieve returns higher than their cost of capital, often making them hesitant to engage in high-risk ventures. By contrast, public sector entities, such as governments and MDBs, can tolerate lower returns on their investments, uniquely positioning them to offer blended finance instruments.

5.1.2 Blended finance instruments and key risks addressed

Blended finance is a powerful tool that can advance energy transition in Asia by allocating some of the risks from the private to the public sector. It mitigates investment risks, expands the pool of potential investors, attracts additional private capital, creates new markets, and lowers capital costs. By utilizing public or philanthropic funds alongside various risk-sharing mechanisms, blended finance can make larger and more impactful projects achievable. It also showcases the viability of pioneering initiatives, thereby facilitating the entry of more conventional financing methods into the market.

Exhibit 15: Blended finance instruments

	Grants	Equity	Hybrid	Debt	Guarantees/ Insurance	Technical Assistance
Examples of concessional use in BF	• First loss grant • Project development capital • Performance based incentives	• Junior equity • First loss capital • Patient capital / long time to exit • Catalytic capital / undefined time to exit	• Subordinated debt (unsecured) • Preferred equity	• Below-market interest rate loans • Longer grace periods • Reduced collateral requirements • Local currency debt	• Partial credit/Risk Guarantees • Political Risk Insurance • Unfunded liquidity support facilities • (Partial) currency risk mitigation • Concessional guarantee fee	• Fund for training programs • Capital used for technical advice from experts
Typical context in which this instrument is applied	• No or few established business cases • **Early-stage finance is needed to lower initial costs** and uncertainty, attracting private capital	• High-risk projects or growth-stage companies seek funding • **Need initial or long-term capital**	• Developer needs to retain ownership in business • **Capital stack needs to reflect specific risk profile and requirements** of the investment e.g., payment schedule, covenants	• Public sector prefers relatively lower risks • **Concessional capital is needed to mitigate risks** and enhance returns, attracting private investment	• Projects are **nearly bankable, but risks** like currency and regulation deter private financing • **Projects exposed to low probability but highly material risks** e.g., CCUS leakage, extreme weather for renewables	• **Advisory services, assistance or training is needed** to enhance projects' technical quality to meet private sector criteria

Source: OECD, "The OECD DAC Blended Finance Guidance", 2021, https://www.oecd-ilibrary.org/development/the-oecd-dac-blended-finance-guidance_ded656b4-en ; Convergence website, https://www.convergence.finance/ ; Expert input

As shown in Exhibit 15, blended finance can be extended in the form of grants, equity, debt, hybrid instruments, guarantees/insurance, technical assistance, etc.[20]. These tools are tailored to the specific needs of each project, based on the risks that need to be addressed. Instruments can be designed to attract private sector capital with varying risk appetites or cater to projects with diverse technological or geographical characteristics. Blended finance instruments are also used in diverse

[20] OECD, "The OECD DAC Blended Finance Guidance", 2021, https://www.oecd-ilibrary.org/development/the-oecd-dac-blended-finance-guidance_ded656b4-en

contexts, such as when there are no established business cases, when growth-stage companies are seeking funding, or when projects need initial and/or long-term capital. Additionally, there are advisory services that offer training to enhance the technical quality of projects to meet private sector investment criteria.

Concessionary capital can be blended with private sector capital at various levels, including at the individual project level and at the broader program or fund level encompassing multiple thematic projects. In project-level blending, public sector investment is utilized to de-risk private sector investments in specific projects. By contrast, in program or fund-level blending, public and private sector capital is pooled together to fund multiple projects. The capital stack in such funds is structured such that public investors assume greater risk through instruments such as first-loss tranches and guarantees in order to attract private capital. This multi-tiered approach to blended finance enhances the scalability and impact of investments, especially in technological or geographic areas lacking large-scale projects that meet private-sector investment criteria.

Blended finance is not intended to address every risk associated with transition projects outlined in Section 2.1. Certain risks are more appropriately managed by the private sector, while others are better mitigated through public sector support. Blended finance may be particularly effective in mitigating the following key risks:

- **Credit risk:** Blended finance can reduce the need for non-concessional financing and lower credit costs for private sector lenders. Concessional funds that enable this include grants, first-loss equity, loans, and mezzanine instruments. Additionally, guarantees can reduce credit risks from the perspective of lenders, and technical assistance can help develop the technical and financial capabilities of project sponsors and other stakeholders.
- **Development risk:** Grants for project preparation from the public sector and philanthropic organizations can mitigate the risk of financial needs impeding project development. Alternatively, such funding can be procured in the form of concessional debt. Also, technical assistance on project development can empower sponsors to carry out development activities more smoothly.
- **Construction risk:** Concessional finance instruments, such as construction equity, guarantees, and insurance, mitigate the risk of project construction not being completed or not being completed according to pre-agreed conditions for financial reasons. Blended finance can also include technical assistance related to construction.
- **Political and regulatory risk:** Political risk insurance covers risks such as the expropriation of project assets or losses resulting from sudden changes in laws and regulations. During a Study Group session, a participant from a MDB highlighted that such institutions are uniquely positioned to offer political risk insurance due to their direct and regular communication with governments. Private sector stakeholders highly value this governmental access, as it can be instrumental in resolving issues if an insurance trigger event occurs.

Different instruments can address various risks. While distinct blended finance offerings have varying impacts on risk mitigation and allocation, Exhibit 16 illustrates the typical impact of each instrument.

Exhibit 16: Simplified mapping of blended finance instruments for mitigating and reallocating key transition project risks

ILLUSTRATIVE

Mitigation and/or reallocation potential: Strong | Partial | Limited

	Grants	Equity	Hybrid	Debt	Guarantees/ Insurance	Technical Assistance
Credit risk	Reducing need for debt financing	First-loss equity	Mezzanine tranches	A/B loans	Separate risk taking from funding	Project preparation facilities
Cash flow risk		Subordinated to senior loan in cash waterfall	(Potentially) higher risk tolerance against CF volatility			
Development risk	Grants and donor financing for project preparation	Development equity fund				Direct project development support
Construction risk	Construction grant	Construction equity fund	Flexible CPs and earlier placement than senior loan	Concessional loans for project preparation	Construction guarantees	Construction assistance
Political and regulatory risk		First-loss equity			Political risk insurance	
Transport and storage risk		First-loss equity	Risk buffer between equity and senior loan		Tailor-made insurance products	

1. Risk mitigation potential of blended finance instruments will ultimately depend on a broad range of contextual factors of the transition technology project, including applicable legal system and regulation, market conditions and technology characteristics

Source: expert input

> ***On the value of political risk insurance in mitigating regulatory and political risks:*** *Private sector investors come to us because various host countries are our shareholders. We have a much deeper relationship than one that is merely contractual, based on the transaction itself, because governments have representatives on our board, and we have access to government officials should there be a problem either during project preparation or subsequently. A number of private investors find this invaluable in enabling them to have a seat at the table should a problem arise.*
>
> *– a development finance institution*

5.1.3 Current status of blended finance in Asia

According to Convergence, a prominent thinktank on blended finance, climate related blended finance in Asia has grown at an annualized rate of 36% between 2020 and 2022, growing from USD 2.0 billion to USD 3.7 billion[21]. However, Convergence follows a narrow definition of blended finance (see Exhibit 14), only including blended finance enabled by concessional capital from the public or philanthropic sectors, and excluding financing enabled by concessional funds provided by the private sector. Therefore, depending on how blended finance is defined, the size of the blended finance landscape in Asia could be larger.

[21] Convergence, State of Blended Finance 2023, October 2023, https://www.convergence.finance/resource/state-of-blended-finance-2023/view

Exhibit 17: Blended finance in Asia by target sector and country

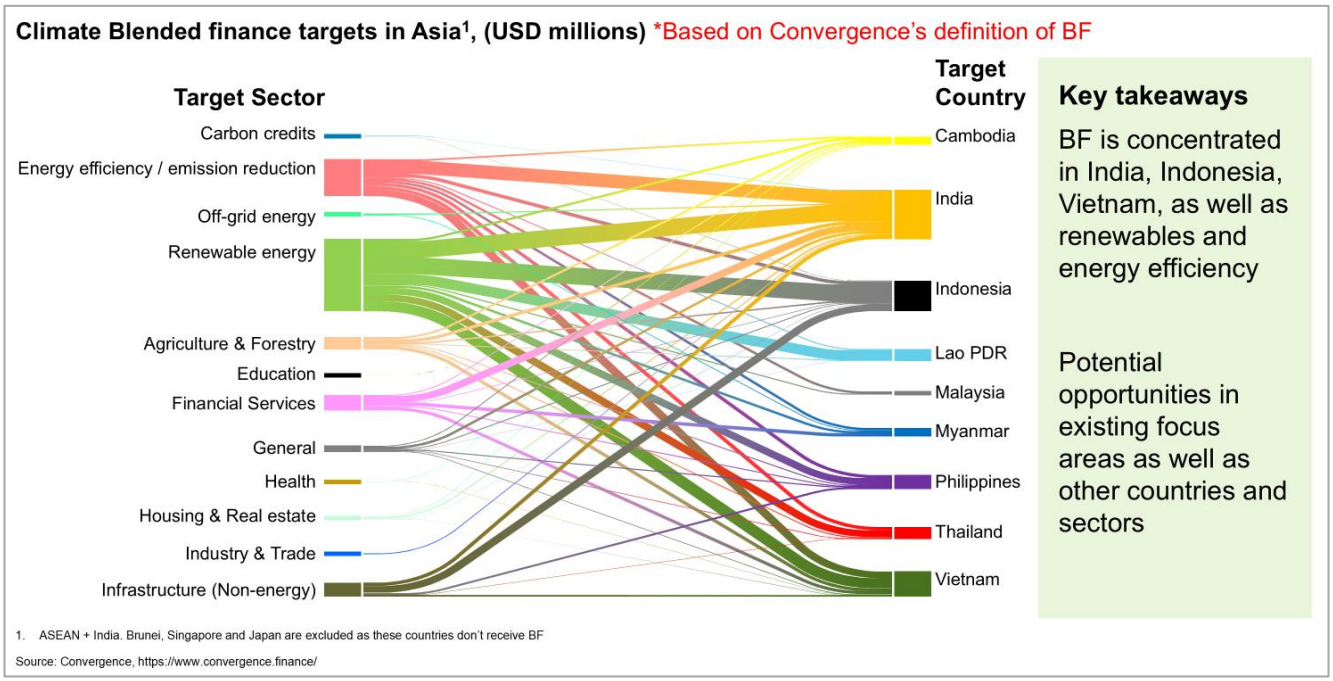


Exhibit 17, which also follows Convergence's definition of blended finance, breaks down the Asian blended finance market by sector and country. The data shows that renewables and energy efficiency projects receive the largest share of blended finance in Asia, potentially due to the substantial size of investment required in these sectors. On a country-by-country basis, India, Indonesia, and Vietnam are the top recipients. These nations are relatively advanced in accelerating energy transition, making them attractive investment destinations.

All forms of blended finance outlined in Exhibit 15 have gained momentum in Asia at both the project and fund levels. For instance, PT Penjaminan Infrastruktur Indonesia, an Indonesian state-owned enterprise, provides guarantees for public-private partnership infrastructure projects to mitigate credit risk and enhance project quality[22]. In Vietnam, energy infrastructure initiatives like floating solar projects have secured blended finance through concessional debt from development finance institutions such as the Asian Development Bank (ADB) and Japan International Cooperation Agency[23]. At the fund level, stakeholders led by MUFG Bank, a commercial bank, including a development finance institution and multiple philanthropic organizations, have collaborated to form Project GAIA. The project is a blended finance platform providing multi-currency commercial loans to climate transition projects across emerging markets[24]. In all cases, blended finance instruments have reallocated some risks from the private to the public sector, making projects bankable and catalysing private sector financing.

[22] PT Penjaminan Infrastruktur Indonesia, "PPP Guarantee: Infrastructure Support Indonesia's Economic Growth", accessed June 2024, https://www.ptpii.co.id/ppp-guarantee

[23] ADB, "ADB, DHD Deal to Provide First Large-Scale Floating Solar PV in Viet Nam", October 2019, https://www.adb.org/news/adb-dhd-deal-provide-first-large-scale-floating-solar-pv-viet-nam

[24] MUFG, "GAIA – a climate and blended finance platform – gains momentum at Paris Summit for a New Global Financing Pact", June 2023, https://www.mufgemea.com/media/gaia-a-climate-and-blended-finance-platform-new-global-financing-pact/

5.2 CHALLENGES AND OPPORTUNITIES FOR FURTHER GROWTH

Blended finance holds immense potential to drive the development of transition assets in Asia. However, the industry faces several significant challenges that can be categorized into three main areas: (1) capability, (2) ecosystem, and (3) financing.

5.2.1 Challenges in scaling blended finance

(1) Capability

A significant challenge in leveraging blended finance for transition assets in Asia is the limited experience and expertise of FIs in structuring complex transactions and appropriately sizing risks. Many FIs lack robust due diligence processes for emerging technologies, which are essential for assessing project bankability. This shortfall is further compounded by the scarcity of reference points necessary for evaluating blended finance instruments. Consequently, this knowledge gap restricts FI participation in blended finance, hindering the development of transition projects.

The disparity between project scales and investment appetites poses another barrier. Many small developers in Asian countries lack the capacity or technical expertise to develop large-scale projects. Conversely, private sector FIs often prefer larger investment opportunities, perceiving smaller projects as higher risk. This perception is exacerbated by the limited number of reference points for assessing the bankability of blended finance projects.

Moreover, transition projects reliant on blended finance require comprehensive risk assessment, including the assessment of technological, social, and environmental risks. However, developing nations often face a shortage of advisors and consultants to perform these crucial evaluations. This overall lack of capability increases the perceived risk of investing in particular transition assets or countries. Addressing these capability gaps is essential for building a robust pipeline of viable transition projects, thereby unlocking the full potential of blended finance in the region.

(2) Ecosystem

Navigating diverse standards and taxonomies is a significant challenge in blended finance, particularly as stakeholders often come from different countries, each with their own unique requirements. Regional misalignments in policies and taxonomies can create confusion and disincentivize international developers from engaging in these projects, given the high costs associated with understanding and operating within various frameworks. Fragmented disclosure standards and classification regimes also lead to data gaps, which hinder efficient development of projects and the creation of effective risk mitigation and allocation instruments.

> ***On challenges related to the lack of interoperability in blended finance:***
> *The definition [of blended finance] itself may be different depending on the preference of entities and institutions or depending on the focus area. This creates communication challenges, in that the different parties may not have the same understanding of terms when discussing blended finance. Also, though blended finance is basically designed bring together the private and public sectors, the focus areas, objectives, support targets may not be the same across institutions.*
>
> *– a development finance institution*

The disparity between public and private sector operations adds another layer of complexity. The two sectors operate on different models, with distinct organizational cultures, incentives, and risk-return

profiles. Public sector initiatives related to blended finance can be perceived as slow or inefficient, which can deter potential private investors or lenders. The disparities complicate risk allocation and alignment of shared funds and initiatives, leading to insufficient collaboration between the two sectors. Furthermore, project owners often do not know how to collaborate with regulators to develop the required regulations or foster the regulators' understanding of the project and technologies.

> ***On the challenges related to the collaboration between multiple stakeholders:***
> *It's very hard to bring together multiple stakeholders who have different criteria for their investment into one space.*
>
> *– an international commercial bank*

Inconsistencies in data tracking, monitoring, and reporting—especially between credit rating agencies, environmental, social, and governance (ESG) specialists, and data providers—also pose significant challenges. While blended finance often involves collecting non-financial data to ensure impactful funding, the lack of standardized metrics and measurement methods hinders investors' ability to compare non-financial metrics across projects. This insufficiency in data sharing impedes the establishment of a robust evidence base for blended finance as a development tool, also making it difficult for investors to compile their impact accurately at the portfolio level.

(3) Financing

Another challenge is the lack of available funding, particularly due to the public sector's limited fiscal resources. This issue partly stems from a lack of strategic coordination among public sector entities, which results in uncoordinated implementation of funding initiatives that could achieve greater impact through better alignment. The public sector also faces development trade-offs, where prioritizing one development goal often means that another receives less funding. Government priorities may shift in response to election cycles and macroeconomic conditions, increasing the risk that public funding will not be provided in the long-term and sustainable manner necessary to catalyze substantial private sector capital. This scarcity of resources creates a bottleneck, hindering the scalability and impact of critical transition projects.

The inherent complexity of blended finance instruments further complicates the landscape. These instruments are often bespoke by nature, making them difficult to replicate across different markets and projects, which in turn delays scaling efforts. The negotiation process is particularly time-consuming as it involves accommodating the varying objectives and preferences of multiple stakeholders, more so than in traditional financing. Concessional capital providers may have varying interests, either aiming to support the development of specific technologies or assist particular groups of people. They may also have different preferences in terms of the degree of concessionality. Each stakeholder has distinct risk preferences and objectives, making the negotiation process lengthy and intricate. This complexity not only slows down the implementation of projects but also hampers the development of innovative financial instruments that could otherwise attract more investment and drive greater impact.

> ***On the lack of replicability of blended finance instruments:***
> *The private investor may focus more on credit events, and this is quite natural, but philanthropic investors may want to focus more on social values. So, what makes the trigger or what constitutes the program? Even philanthropic investors may take on more credit risk to support some social values. This creates challenges in negotiating and structuring the risk allocation and monitoring frameworks also taking the investors' preference into account. This complexity is the main source of the difficulty.*
>
> *– a development finance institution*

In sum, the challenges in blended finance for transition projects largely stem from the nascent state of the technologies they aim to fund and the inherent complexity of blended finance instruments themselves. The involvement of numerous stakeholders, each with different interests and capabilities, further complicates the landscape. Several solutions to these challenges are outlined below, offering a pathway for blended finance to become more effective and scalable.

5.2.2 Opportunities to overcome challenges

(1) Government support

Governments play a crucial role in overcoming the challenges of blended finance for transition projects. One key area is the development of a sound legal framework to improve the private sector's capacity to structure projects. A robust legal framework ensures that all parties understand the legal parameters of financial deals, including the execution of court orders during bankruptcy events and arbitration processes.

In addition to legal frameworks, governments can incentivize investments in transition projects through fiscal measures or the establishment of carbon markets. These incentives can significantly enhance the financial attractiveness of such investments, encouraging more private sector participation. By focusing on these areas, governments can create an enabling environment that supports the development and scaling of blended finance initiatives.

(2) Standardization

To streamline blended finance for transition projects, industry players such as developers, financiers, and insurance companies can come together to standardize practices across markets and countries. Advisors and industry bodies can facilitate discussions, aiming to shorten project development times by reducing the need for repeated negotiations. Standardizing key elements, such as documentation and technical assistance for project developers and streamlined instruments and procedures for FIs, can significantly enhance efficiency and predictability.

A granular categorization of country risks and the identification of trigger events are essential for industry-wide standards. For instance, in project finance, regardless of local features, terms such as power purchase agreements, offtake agreements, and concession agreements are universally understood. This level of standardization should be extended to blended finance as well, where clear definitions and trigger events for risks are established. Collecting relevant data around these identified risk factors will enable better quantification of risks, giving confidence to providers of credit guarantees and political risk insurance.

Developing and aligning climate roadmaps, taxonomies, and disclosure standards, along with increasing data availability, are also crucial steps. Standardized guidelines must remain relevant and current, requiring continuous updates by industry bodies. Credit and sustainability rating agencies

should also continuously monitor and update their methodologies to better reflect host country conditions and the imperatives of climate change. Through these collective efforts, industry players can create a more cohesive and efficient framework for blended finance, facilitating the transition to sustainable technologies.

> ***On collaborating and standardizing interests among stakeholders:***
> *There is no beating around the bush that blended finance transactions just take longer because you are aligning the interests of various parties that do not seek the same outcome. You're looking you are involving investors who want impact, with investors that need commercial return, with local governments. So matching those is the biggest art in blended finance…you have to think about the interests of the people at the table, and how you can bring them together. And sometimes you can't, sometimes you need some people to give. But what I've seen is mapping what people need first helps creating these types of projects.*
> *– a development finance institution*

(3) Capacity building of stakeholders

Capacity building of stakeholders, especially local FIs and regulators, is also a critical step in the right direction. By collaborating with MDBs or international FIs, local FIs can build the capacity to develop blended finance projects for transition assets. This may include establishing processes and frameworks to understand how to analyze and execute blended finance projects and determine the appropriate degree of risk management and public sector involvement. Another example is building capacity to structure more complex investment vehicles, such as combining small projects into larger funds to achieve a scale that attracts private financiers in general, rather than relying on project-by-project financing. Additionally, FIs, potentially with the support of advisors, can develop reporting standards, monitor impact, and share information on blended finance transactions, including key project terms and impact metrics. These efforts will enhance transparency and build confidence among stakeholders, ultimately increasing the amount of capital available for transition projects.

MDBs can also play a crucial role in building capabilities of regulators. Leveraging the close relationships with regulators, MDBs can facilitate conversations between regulators and project owners, organize workshops with regulators, and even supporting the drafting of new regulations.

In sum, the key to successfully scaling blended finance lies in collaboration across stakeholders. By fostering partnerships between the public and private sectors, including local and international FIs, MDBs, governments, and advisors, the industry has the potential to further unlock private capital with blended finance, enabling the growth of transition projects. The ATF SG aims to serve this purpose, providing a platform for various players to share lessons, address challenges, and forge stronger relationships.

Case Example 2: GAIA[25, 26, 27]
GAIA is a USD 1.5 billion blended finance platform led by MUFG Bank and FinDev Canada, Canada's bilateral development finance institution. It aims to mobilize private sector capital at scale

[25] MUFG, "GAIA – a climate-focused blended finance platform – receives US$150 million approval from the Green Climate Fund", October 2023, https://www.mufgemea.com/media/gaia-receives-us-150-million-approval-from-the-green-climate-fund/

[26] GCF, Projects & Programmes: Project GAIA, accessed August 2024, https://www.greenclimate.fund/project/fp223

[27] Project GAIA Environmental and Social Management System (ESMS), June 2023, https://www.bk.mufg.jp/global/productsandservices/corpandinvest/gcf/pg/pdf/system_english.pdf

to enable the global south's transition to a low-carbon and climate-resilient future. Its partners include the Green Climate Fund (GCF), which has pledged to provide USD 150 million in equity to the fund.

The fund strategically targets projects that address climate adaptation and/or mitigation in underfunded markets. 70% of the fund's investments will be allocated to climate adaptation projects such as water access and usage and sustainable agriculture, and a further 25% will be allocated to least developed countries and small island developing states to ensure the funds reach to the most climate-vulnerable communities.

As a loan fund, GAIA is designed to blend commercial and concessional capital to fund climate mitigation and adaptation projects in the global south. It deploys concessional financing to de-risk investments from the perspective of the private sector through mechanisms such as junior concessional debt tranche, second-loss tranche, and foreign exchange hedges. In addition to loan financing, GAIA aims to enhance the governance and management systems of projects through technical assistance.

Case Example 3: ASEAN Catalytic Green Finance Facility (ACGF)[28]

The ACGF is an initiative under the ASEAN Infrastructure Fund, a fund created by ASEAN member governments and the ADB. The ACGF supports governments in Southeast Asia in preparing and financing climate-friendly infrastructure projects. The fund is a blended finance instrument, as it aims to mobilize private capital from the onset, prioritizing projects that are able to attract 10% or more of their financing from private capital sources. Owned by ASEAN governments, the ACGF places an emphasis on regional cooperation and commitment to energy transition.

The ACGF uses a two-pronged approach, combining loans and technical assistance, to de-risk green infrastructure projects for private capital investors, making them more attractive investment opportunities. The ACGF provides loans funded by development finance institutions to cofinance upfront capital investment costs while also supporting governments to identify and prepare commercially viable green finance projects. To enable this, the ACGF brings together a multitude of public sector institutions. Since its inception in 2019, multiple development finance institutions, including the ADB, the European Investment Bank, the Green Climate Fund, the EU, and development finance institutions from France, Germany, South Korea, and Italy, have provided cofinancing and technical assistance through the ACGF.

A key component of the ACGF is its comprehensive end-to-end technical assistance for the development of green infrastructure projects. This assistance encompasses policy development, project identification and design, risk assessment and management, and contract negotiation. In addition, the ACGF facilitates the issuance of green and social bonds by advising on guideline creation, structuring, and communication with investors. By helping with government and FI capacity building, the ACGF strengthens the entire TF ecosystem, catalyzing industry growth.

Case Example 4: Pentagreen[29]

Pentagreen is a blended finance platform supported by Temasek and HSBC, with each holding a 50% share. It was launched in 2022 with the objective of deploying USD 1 billion in loans towards sustainable infrastructure projects in Southeast Asia over a five-year horizon. The platform's

[28] ADB ASEAN Catalytic Green Finance Facility website, accessed July 2024, https://www.adb.org/what-we-do/funds/asean-catalytic-green-finance-facility/main

[29] Pentagreen website, accessed July 2024, https://www.pentagreen.com/

investment scope encompasses zero-carbon infrastructure projects across sectors such as renewable energy, sustainable transportation, water management, waste treatment, circular economy initiatives, and electric vehicles.

Similar to the ACGF, Pentagreen is designed to address funding gaps for sustainable infrastructure projects through the dual approach of loan financing and technical assistance. The fund's structure aims to mobilize private capital for clean infrastructure projects that are on the threshold of bankability, referred to as "marginally bankable" projects. In terms of technical assistance, Pentagreen engages with strategic partners including the ADB for project origination and technical support, and Clifford Capital Holdings for project finance expertise and operational support.

Pentagreen is committed to ensuring that its financial resources substantively contribute to the energy transition. In addition to conventional risks such as cash flow and operational risks, projects undergo due diligence for market acceptance and environmental impact. Borrowers are often required to implement environmental and social action plans with key performance indicators that are monitored throughout the loan tenure.

Pentagreen also structures its loans to ensure the intended use of funds through use-of-proceeds driven loan mechanisms. For example, it extended USD 100 million in loans to Citicore Renewables, with the proceeds specifically designated for deployment in solar projects in the Philippines. It also provided USD 30 million in loans to BE Capabilities and Insights Solutions, an energy-as-a-service provider operating across Asia. This financing will support the establishment of 14 decentralized bioenergy installations in Indonesia, Thailand, Cambodia, the Philippines, and India. These installations will convert agricultural waste and other feedstock into energy to be utilized by industrial and manufacturing companies in sectors such as food and beverages, consumer goods, construction materials, and agricultural products.

Potential actions relevant stakeholders may take: Growing blended finance	
Public sector	**Private sector**
Robust regulatory environment ● Develop sound legal frameworks that enable effective structuring of blended finance deals, such as clear guidelines for bankruptcy proceedings ● Incentivize private sector funding into transition projects through policy support such as the development of carbon markets **Effective capacity building** ● Enhance the capability of local FIs and regulators with the support of MDBs by leveraging their close relationships with both the private and public sectors, including governments ● MDB support may include establishing processes and frameworks, and developing and executing blended finance instruments with local FIs	**Industry wide collaboration** ● Standardize practices such as trigger events for defaults across markets to streamline structuring of blended finance investments ● Develop and align guidelines, taxonomies, and disclosure standards with the support of regulatory bodies and credit rating agencies ● Share and utilize relevant data to inform the quantification of risks **Effective capability building** ● Enhance the capability of local private sector lenders in areas such as risk identification and mitigation/allocation, reporting and monitoring, and structuring of complex finance vehicles, with the support of international FIs

6 CONCLUDING REMARKS: PATH FORWARD FOR ASIA

This year's Study Group highlighted the critical importance of ensuring feasibility and bankability through effective risk management. As transition projects are exposed to higher levels of risk than conventional projects, it is evident that FIs and project owners cannot manage all the risks on their own. This necessitates a collaborative approach among various stakeholders to ensure comprehensive risk management and project success. Among the various ways to mitigate and allocate risks, three elements came up repeatedly throughout the discussions:

1. **Government/regulator support**: Among the various stakeholders, governments play an especially critical role in terms of the support they can provide. Government support includes not just subsidies, but also supportive regulatory frameworks that are interoperable across sectors that can serve as the foundation for these projects

2. **Insurance and guarantees**: Insurance and guarantee providers, along with advisors, are indispensable for fostering an enabling environment. These entities help in transferring and allocating risks that are beyond the control of FIs and project owners. Their involvement can significantly enhance the bankability of projects by providing financial security and risk-sharing mechanisms

3. **Blended finance**: Blended finance emerges as a crucial tool in the risk allocation landscape. By combining public and private sector funding, blended finance can leverage additional resources and reduce risk exposure for private investors. This approach not only makes projects more attractive but also ensures that they are financially sustainable and socially impactful

Looking ahead, the Study Group will focus on the following actions to build on this year's insights and collaborative efforts:

1. **Continue peer learnings and collaboration with broader TF stakeholders**: We will continue to gain a deeper understanding and practical knowledge from our peers while further strengthening collaboration with a broader range of stakeholders, including public authorities, insurance and guarantee providers, and advisors to discuss creating the enabling environment to develop transition projects in Asia

2. **Transition to more concrete discussions**: We will move toward identifying specific action areas that support the implementation of unlocks identified so far

The ATF Study Group would like to thank all those who have assisted in its work so far and appreciates the opportunity to keep working together going forward.

APPENDIX

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1. Glossary

Glossary of Terms

Carbon credits	Certificate representing carbon dioxide equivalents that is either prevented from being emitted into the atmosphere or removed from the atmosphere
ADB (Asian Development Bank)	A regional development bank focused on Asia and the Pacific. It provides loans, technical assistance, grants, and equity investments to promote social and economic development
CCUS	The technological process of capturing CO_2 from or before it enters the atmosphere, and then transporting and storing it (carbon sequestration) permanently
Climate (carbon) neutral/net zero emissions	Cutting GHG emissions to close to zero, with any remaining emissions absorbed by forests and oceans
Concessional finance	Below market rate finance provided mainly to developing countries to accelerate climate or development objectives. The term does not represent a single mechanism or type of financial support but comprises a range of products
Convergence	A nonprofit entity operating as a global network for blended finance, comprising private investors, businesses, public agencies, and philanthropic foundations. It provides market intelligence, knowledge products, and networking events
Decarbonization	Reducing or removing carbon dioxide emissions, usually by using low carbon power sources
ERIA (Economic Research Institute for ASEAN and East Asia)	An international economic research and policy organization established in Jakarta, Indonesia in 2008 by a formal agreement among leaders of 16 countries in the East Asian region
General (Corporate) Purpose financing	Financing for general corporate purposes, such as working capital, capital expenditures, acquisitions, stock repurchases, and refinancing
GHG (greenhouse gas) emissions	Also known as greenhouse gas emissions, these are gases (particularly CO_2) that trap heat in the atmosphere, causing climate change
Green bond/loan	Any type of bond or loan instrument whose proceeds are used in part to fund projects that make a substantial contribution to an environmental objective
Green finance	Any financing that is created to benefit sustainable development
IEA (International Energy Agency)	An autonomous intergovernmental body established in the framework of the Organization for Economic Co-operation and Development (OECD) whose mission is to shape global energy policies for a secure and sustainable future
IFC (International Finance Corporation)	The largest global development institution focused on growing the private sector in emerging markets. It offers investment, advisory, and asset-management services. It is a member of the World Bank Group
Just and orderly transition	The concept of moving toward decarbonization and climate sustainability while weighing the reliability of the energy supply and affordability of energy, and avoiding social instability
MIGA (Multilateral Investment Guarantee Agency)	An international institution promoting cross-border investment in developing countries by providing guarantees (political risk insurance and credit enhancement) to investors and lenders. It is a member of the World Bank Group
Pathway	A process or roadmap for how a country or company will reach its stipulated emissions targets. Also referred to as climate (carbon) neutral/net zero pathways.

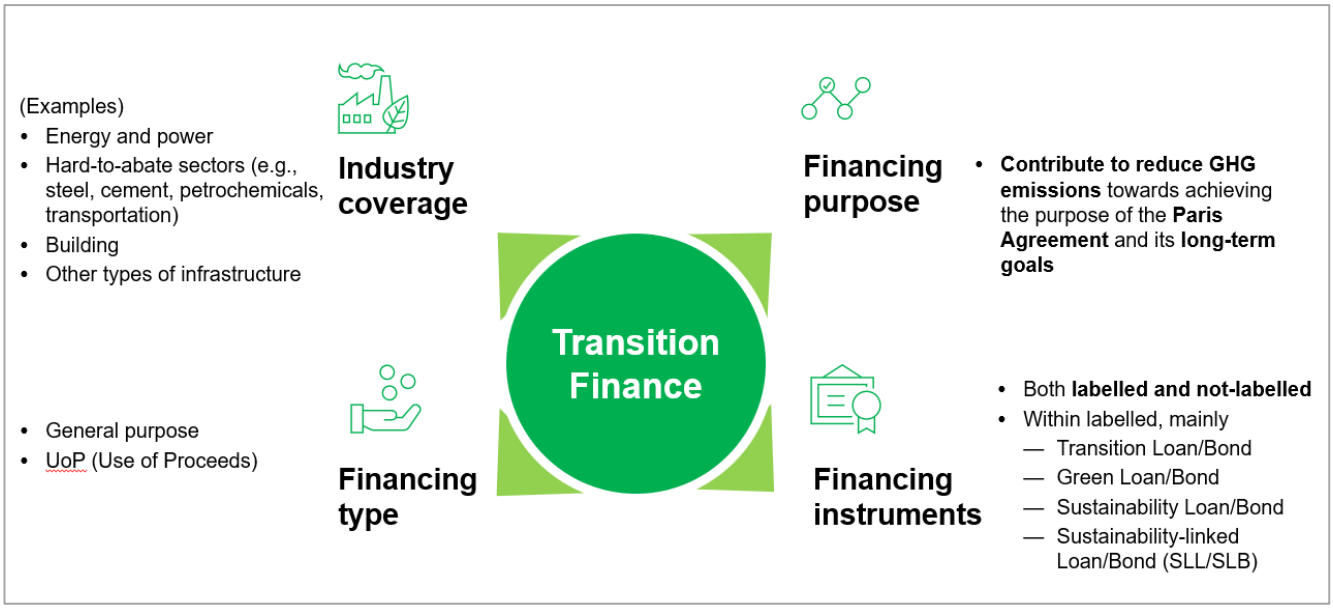
Risk allocation	The transfer of risks among stakeholders without significant reduction in overall project risk. This leads to risk reduction / mitigation from the perspective of the risk transferor.
Risk management	Addressing risks through either risk allocation or risk reduction/mitigation
Risk reduction / mitigation	Th reduction of overall project risks from the perspective of all stakeholders
Social Bond	Any type of bond instrument whose proceeds are used to fund projects that address or mitigate a social issue and/or seek to achieve positive social outcomes
Sustainable finance	The process of taking environmental, social and governance (ESG) considerations into account when making investment decisions in the financial sector, leading to more long-term investments in sustainable economic activities and projects
Taxonomy	Classification system that provides businesses with a common language and the means to identify whether or not a given economic activity is environmentally sustainable
Technology roadmaps	Roadmaps that outline the technologies that will be necessary to get specific industry sectors aligned with the Paris Agreement, showing which technology should be ready for use in what year
The Paris Agreement	A legally binding international climate change treaty that sets a global framework for how countries should reduce GHG emissions. Its goal is to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels. Article 4, paragraph 2 requires each country to document how it will achieve its reductions in plans known as nationally determined contributions
Transition activities	Activities that support a just and orderly transition to low-carbon economies by lowering rather than eliminating GHG emissions
Use-of-Proceeds financing	Financing instruments that support specific projects. Funds cannot be used for purposes other than pre-agreed activities

2. Definition of Transition Finance

In this report the Study Group considers TF as follows:

- **Financing purpose:** TF could provide **financial support** to **contribute to reducing GHG emissions towards achieving the purpose of the Paris Alignment and its long-term goals**.
- **Financing instruments:** TF could include both **"labelled" and "non-labelled"** instruments. While the International Capital Market Association's (ICMA) *Climate Transition Finance Handbook* (the *ICMA Handbook*) shows four key elements for labelled transition bond issuance, the concept may apply to other instruments. Therefore, the Study Group considers that financing instruments for TF could be **bonds, loans, equity, and others including sustainability-link loans/bonds (SLL/SLB)**.
- **Financing type:** the two main categories of TF are:
  - **General Purpose financing**, which supports a corporation's overall decarbonization strategy,[30] and
  - **Use-of-Proceeds (UoP) financing**, which supports specific projects contributing to environmental objectives including decarbonization.[31]
- **Industry coverage:** TF could be used not only for fossil fuel energy or power sectors, but also **for other hard-to-abate industry sectors (e.g., steel, cement, chemicals**, **transportation, agriculture), buildings, and other types of infrastructure, etc.**

Exhibit 18: Transition finance landscape



[30] The term 'General Purpose financing' is borrowed from ICMA, which specifies that it takes the form of sustainability-linked bonds. *Sustainability-Linked Bond Principles* and *Sustainability Linked Loan Principles* list specific requirements for issuing sustainability-linked bonds/loans. (The *ATF Guidelines* is not limited to debt instruments.) SLBs can also be issued by sovereigns and banks although the majority of issuers are corporates.

[31] The term 'UoP financing' is borrowed from ICMA, which stipulates that it can be either green bonds, social bonds, or sustainability bonds. For more detailed information, see the ICMA's *Green Bond Principles*, *Social Bond Principles* and *Sustainability Bond Guidelines* for debt instruments, as well as *Green Loan Principles*, *Social Loan Principles* and *Sustainability Linked Loan Principles* published by Loan Market Association, Asia Pacific Loan Market Association and Loan Syndications and Trading Association.

3. SME Support

The Study Group recognizes the need for additional efforts for Small and Medium-sized Enterprises (SMEs) in their transition journey. Previous Study Groups found, based on survey feedback and one-on-one sessions, that simplified and tailored TF guidelines and a data platform for SMEs could unlock their capabilities and capacities. This year, the ATF SG discussed the challenges and opportunities for SMEs when it comes to their transition journey in an effort to gain a more detailed understanding of the current challenges and potential solutions.

3.1 IMPORTANCE OF SMES IN NET ZERO TRANSITION

SMEs are the backbone of many economies, particularly in Asia. Globally, SMEs make up about 90% of businesses, and this figure rises to nearly 99% in the ASEAN region[32, 33]. In terms of GDP representation, SMEs contribute approximately 40% globally and 45% regionally within ASEAN[3435]. Employment figures are also significant, with SMEs accounting for 50% of global employment and an astonishing 85% in ASEAN[36, 37]. This underscores their critical role in economic stability and growth.

However, when it comes to decarbonization and achieving net-zero emissions, SMEs face considerable challenges. SMEs are responsible for about 50% of GHG emissions, yet there is a substantial knowledge gap – only 22% of SMEs fully understand the term “net zero,” a mere 10% are currently measuring their GHG emissions, and just 8% have announced net-zero targets for 2050[38]. This indicates that, while the importance of decarbonization is recognized, many SMEs have yet to embark on the journey toward net-zero emissions. Larger companies are increasingly focusing on Scope 3 emissions, which encompass their entire supply chain including numerous SMEs. Despite this, the path to net-zero for SMEs remains long and challenging.

> ***On the importance of supporting SMEs in their net-zero transition:***
> *SMEs are key to the net-zero transition because they contribute significantly to global emissions. Therefore, their transition to net zero is an especially important area that organizations are very keen to work on from a private-sector perspective.*
> *– an international financial institution*

There have been efforts to support SMEs in this transition, primarily led by public sector institutions. However, these initiatives are not sufficient. There is a pressing need for targeted strategies and

[32] IFC, Small Business, Big Growth: How Investing in SMEs Creates Jobs, March 2021, https://www.ifc.org/en/insights-reports/2021/small-business-big-growth

[33] OECD/ERIA, SME Policy Index: ASEAN 2018: Boosting Competitiveness and Inclusive Growth, September 2018, https://www.oecd-ilibrary.org/development/sme-policy-index-asean-2018/economic-context-and-role-of-smes-in-asean_9789264305328-5-en

[34] World Bank Group, “Small and Medium Enterprises (SMEs) Finance”, October 2019, https://www.worldbank.org/en/topic/smefinance

[35] ASEAN Secretariat, “Development of Micro, Small, and Medium Enterprises in ASEAN (MSME)”, accessed June 2024, https://asean.org/our-communities/economic-community/resilient-and-inclusive-asean/development-of-micro-small-and-medium-enterprises-in-asean-msme/

[36] ASEAN Secretariat, “Development of Micro, Small, and Medium Enterprises in ASEAN (MSME)”, accessed June 2024, https://asean.org/our-communities/economic-community/resilient-and-inclusive-asean/development-of-micro-small-and-medium-enterprises-in-asean-msme/

[37] IFC, Small Business, Big Growth: How Investing in SMEs Creates Jobs, March 2021, https://www.ifc.org/en/insights-reports/2021/small-business-big-growth

[38] OECD, Financing SMEs and Entrepreneurs 2024: An OECD Scoreboard, March 2024, https://www.oecd-ilibrary.org/industry-and-services/financing-smes-and-entrepreneurs-2024_62bb6922-en

specific attention to enable SMEs to accelerate their transition toward sustainability and net-zero emissions.

3.2 CHALLENGES FOR SMES IN TRANSITION FINANCE

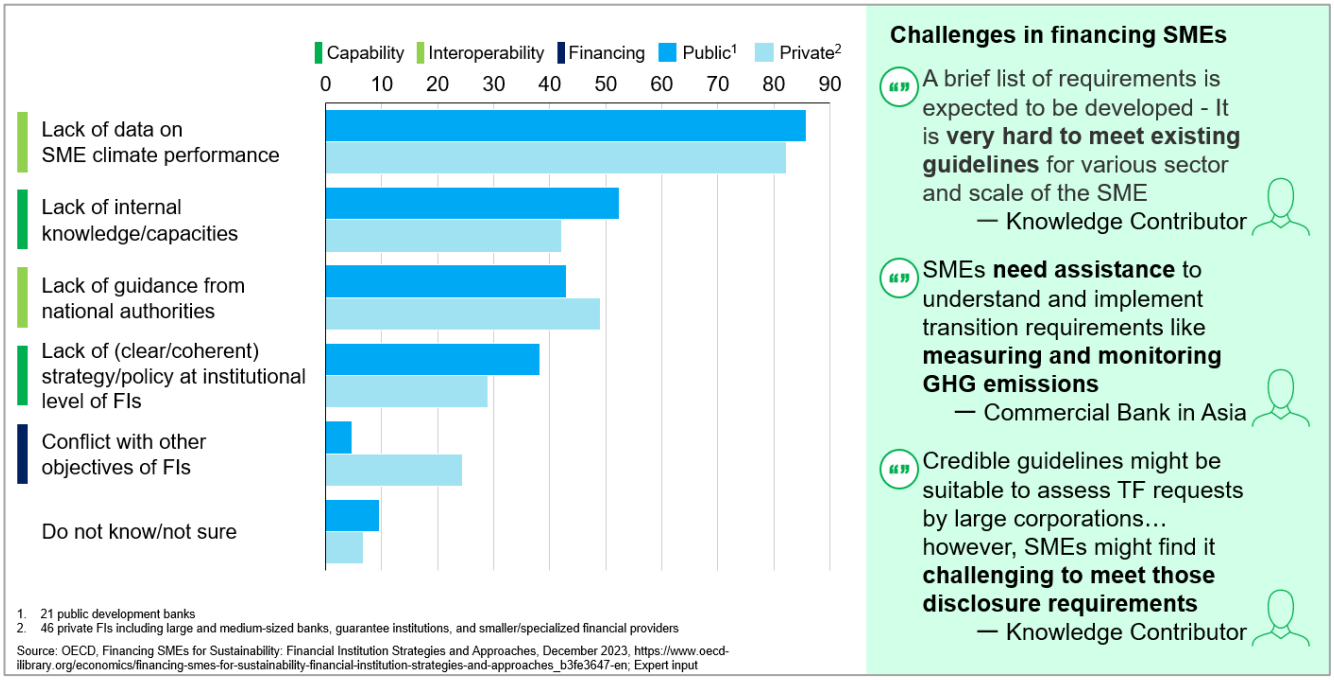
Understanding the pivotal role of SMEs in the global economy and their contribution to GHG emissions, it is vital to delve into the specific challenges they face on the path to decarbonization. Based on the ATF SG discussions, the challenges SMEs are facing can be broadly categorized into financial constraints, data limitations, lack of awareness, and regulatory and guideline burdens.

3.2.1 Financial Constraints

One of the most significant barriers for SMEs in their journey toward net zero is the lack of finance. The SME finance gap globally is close to USD 6 trillion and can exceed USD 8 trillion when considering informal enterprises[39]. This considerable shortfall highlights the challenges SMEs face in securing the funds necessary for substantial investment in sustainable practices.

Many FIs struggle to provide financing to SMEs for a variety of reasons, as shown in Exhibit 19. Over 80% of public and private FIs see the insufficient data on SMEs' climate performance as a bottleneck[40]. Additionally, FIs themselves often lack knowledge of how best to serve SMEs. In many countries, there is limited specific guidance on financing SMEs for transition, and within FIs, there is sometimes no clear strategy for serving SMEs in this area. These factors have combined to result in a lack of focus on providing financing to SMEs in the context of their net zero transition.

Exhibit 19: Key challenges FIs face in supporting SMEs



[39] IFC, "MSME Finance", accessed June 2024, https://www.ifc.org/en/what-we-do/sector-expertise/financial-institutions/msme-finance

[40] OECD, Financing SMEs for Sustainability: Financial Institution Strategies and Approaches, December 2023, https://www.oecd-ilibrary.org/economics/financing-smes-for-sustainability-financial-institution-strategies-and-approaches_b3fe3647-en

3.2.2 Data Limitations

Data limitations are another significant hurdle. FIs often do not have enough data or find it difficult to obtain, which hampers their ability to provide the necessary financing for SMEs. Without adequate data, these institutions struggle to substantiate what SMEs are doing, where they are, and what they are contributing in terms of sustainability.

This creates a vicious cycle whereby SMEs cannot prove their compliance with sustainability standards, thus hindering their access to transition finance and other support mechanisms. The absence of standardized reporting frameworks and tools further exacerbate this issue, making it difficult for SMEs to benchmark their performance and identify areas for improvement.

> ***On the limitations of data pertaining to SMEs:***
> *It is not that [SMEs] do not comply. It is just that they cannot prove their ability to comply due to insufficient data. This is the crux of the matter.*
>
> *– an international financial institution*

3.2.3 Lack of awareness

For many smaller SMEs, climate change and net zero targets are not high priorities. Their focus is on survival and gaining access to basic capital, rather than worrying about sustainability or transition projects. It is often only after they have grown into mid-sized businesses that they begin to expend effort on sustainability-related issues.

Many SMEs are not aware that they can introduce new products and processes in a green and sustainable way while simultaneously making money. SMEs do not yet see the net zero transition as a competitive advantage. There is a prevalent belief among them that sustainability efforts are merely additional costs or burdens rather than opportunities for growth and profitability.

The large diversity of SMEs in ASEAN countries further complicates the awareness issue. Cultural and socioeconomic factors play a significant role in shaping business priorities and access to resources. For example, many women entrepreneurs in ASEAN face challenges in accessing financing due to their relatively weaker ability to meet collateral requirements due to low property ownership and land rights, limited knowledge of financial tools, and lacking confidence in loan negotiation and credit histories[41].

3.2.4 Guidelines/regulatory burdens

Regulatory challenges further complicate the transition to net zero for SMEs. Most regulations, such as disclosure requirements, are designed with larger companies in mind. However, all companies are expected to comply with the same standards, regardless of size. Although consistency and fairness are essential in regulatory frameworks because the same policies apply to all businesses, this one-size-fits-all approach leaves SMEs shouldering disproportionate burdens.

As SMEs navigate their way through the net zero transition, they must comply with multiple administrative burdens, especially if they are part of larger supply chains. The regulations can sometimes have conflicting requirements, adding to the complexity. With stakeholders increasingly

[41] United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP) and ASEAN Coordinating Committee on Micro, Small and Medium Enterprises (ACCMSME), Strengthening Women's Entrepreneurship in National Micro, Small and Medium Enterprise Policies and Action Plans, November 2022, https://www.unescap.org/kp/2022/asean-policy-toolkit

demanding a certain level of sustainability commitment, emissions reduction, and reporting, larger companies often pass down these compliance burdens to smaller suppliers in their supply chain.

These burdens become disproportionately large for SMEs because they lack the capacity to manage these requirements effectively. While larger companies have dedicated teams and resources to handle compliance, SMEs struggle to keep up. They may not have the capability to meet these demands, putting them at a disadvantage when competing for contracts.

3.3 UNLOCKS FOR SMES IN TRANSITION

Several strategies can help unlock the potential of SMEs in their transition to net zero. These include practical policy frameworks, access to data, access to finance and incentive programs, non-financial support, and capability building.

3.3.1 Practical frameworks and regulations

Frameworks and regulations must be practical and adaptable. One tool that is designed to provide local context to ASEAN companies is the ASEAN Transition Finance Guidance, which synthesizes key principles of existing international guidelines to provide investors with clarity on evaluating transition finance opportunities.

Additionally, the ASEAN Taxonomy provides clear guidance that accommodates different levels of readiness, as it is designed to be a practical tool to help SMEs understand the requirements and take the necessary steps towards sustainability. The ASEAN Taxonomy provides a multi-tiered approach of Foundation Framework and Plus Standard, with Foundation Framework focused on qualitative guiding questions, decision trees, and use cases to aid in the assessment, and the Plus Standard utilizing both qualitative and quantitative information. This tiered approach helps SMEs start their sustainability journey even with limited data availability, allowing them to gradually move up tiers as they build their capacity and resources. Moreover, considering unique challenges faced by SMEs, developing tailored regulations feasible for SMEs is crucial. This could include phased implementation timelines, simplified reporting requirements, and targeted support programs. By creating a supportive regulatory environment, policymakers can encourage more SMEs to embark on their sustainability journey without feeling overwhelmed by the compliance burden.

3.3.2 Access to data

Enhancing access to necessary data for SMEs is essential and requires collaborative efforts between the public and private sectors. Initiatives such as the SAFE community play a pivotal role by bringing together regulators and industry stakeholders to develop practical solutions for data disclosure (Case Example 5). By adopting a quasi-public utility approach, these initiatives ensure that SMEs can access the necessary tools and resources without incurring prohibitive costs. Regular engagement with central banks, capital market regulators, and private sector players bridges the gap between policy and practice, ensuring that the solutions developed are both effective and feasible.

Case Example 5: SFIA's Single Accesspoint for ESG Data (SAFE) Initiative[42]
SFIA is an independent institute established to develop a sustainable finance ecosystem in ASEAN. By bringing together stakeholders across the region, including governments, regulators, central banks, FIs, academia, and MDBs, SFIA serves as a neutral space for open discussion and collaboration. SFIA aims to catalyze systematic change by providing policy recommendations to ASEAN countries and through thought leadership. The institute's key activities include hosting the ASEAN Taxonomy Board, which incorporates inputs from central banks, regulators, and financial agencies. The taxonomy offers science-based guidance to classify projects with the aim of mobilizing capital towards sustainable

[42] SFIA website, accessed August 2024, https://www.sfinstitute.asia/

activities, providing a common language that stakeholders across the region, including government, regulators, FIs, and real economy participants can use.
In terms of access to data, SFIA facilitates disclosures and interoperability through its Single Accesspoint for ESG Data (SAFE) Initiative. The SAFE Initiatives takes a community-led approach, and through its technology partner, provides a single access point for ESG data across ASEAN for the sharing of credible, comprehensive, and consistent data to enable informed decision making through an open architecture platform. It brings together various stakeholders including regulators, FIs, corporates, standard setters, technology providers, and industry associations to foster the data and disclosure ecosystem in ASEAN, as well as build interoperability with key parties internationally. By collectively building a standardized approach to reporting practices, SAFE also aims to increase data reliability and efficiency.
One of the key beneficiaries of SAFE is SMEs. The Initiative provides resources and support to enhance ESG reporting and disclosure activities for SMEs across ASEAN. Designed with inclusivity in mind, SAFE aims to be accessible and beneficial for all stakeholders. It also welcomes contributions from various member states and stakeholders, ensuring that it meets the diverse needs of ASEAN and beyond.

3.3.3 Access to finance and incentive programs

Access to finance remains a critical component. Programs such as the Small Loan Guarantee Program and the Global SME Finance Facility (GSMEF) run by the International Finance Corporation (IFC) have been established to bridge the financing gap[43]. These initiatives provide risk-sharing facilities and expand lending to SMEs in challenging markets, helping them overcome financial barriers. FIs play a key role in providing the necessary capital and incentives for SMEs to invest in sustainable practices.

Furthermore, incentive programs that offer competitive rates for sustainability-labeled products can encourage SMEs to adopt sustainable practices. By making sustainability financially attractive, these programs help SMEs see the business case for sustainability and integrate it into their operations. By reducing the financial burden on SMEs, these incentives can accelerate the adoption of sustainable technologies and practices.

Case Example 6: IFC's Global SME Finance Facility (GSMEF)[44]

The GSMEF is a blended finance facility launched in 2012 focused on financing SMEs in emerging markets. The facility indirectly supports SMEs through local FIs by encouraging them to expand their lending efforts to underserved SMEs in challenging markets and segments. By supporting IFC's investment and advisory services to local FIs, GSMEF aims to create one million new jobs in SMEs. As of 2022, the facility has supported 171 projects across 38 countries, 42% of which are classified by the World Bank as fragile and conflict affected.

IFC blends donor contributions with its own capital to structure investment projects. The facility's two main donors are the UK Foreign, Commonwealth & Development Office and the Netherlands Ministry of Foreign Affairs, which together have contributed more than USD 150 million since the facility's inception. For each investment project, IFC leverages donor capital by investing small amounts into concessional instruments such as loans with below-market terms and guarantees for risky investments, and combining them with larger, non-concessional funding, including IFC's own capital and capital provided by other FIs.

In addition to crowding in capital to SMEs, GSMEF has enabled IFC to provide fee-based advisory services. These services include helping emerging market central banks build financial infrastructure to support SMEs by strengthening credit bureaus, collateral registries, and regulations. IFC has also supported local FIs expand coverage to SMEs in a profitable way by supporting the establishment of specialized banking units.

[43] IFC website, accessed August 2024, https://www.ifc.org/

[44] IFC website, accessed August 2024, https://www.ifc.org/

Finally, GSMEF also enables the growth of SME financing in emerging markets through thought leadership and knowledge products. Examples include helping FIs adapt alternative credit scoring algorithms for SME and consumer lending. IFC has also conducted research to measure the impact of GSMEF by analyzing the impact of funds deployed to SMEs through FIs, including on job creation.

3.3.4 Non-financial support and capacity building

Non-financial support, such as capacity building and training, is equally important. Programs developed in partnership with larger institutions can provide SMEs with the knowledge and resources needed to adopt sustainable practices. For example, training programs for financial inclusion and sustainability delivered through platforms such as Grab can reach a wide audience of SMEs[45]. These programs help SMEs understand the benefits of sustainable practices, how to implement them, and how to measure their impact.

In addition, fostering a culture of collaboration and knowledge sharing among SMEs can drive collective progress towards sustainability. Industry associations, chambers of commerce, and business networks can play a pivotal role in facilitating peer-to-peer learning and dissemination of best practices. By leveraging these platforms, SMEs can gain insights from their peers' experiences and implement proven strategies in their own operations.

3.4 CONCLUSION

The transition to net zero for SMEs is a complex but essential journey that requires a combination of financial support, practical policy frameworks, and collaborative efforts. Accurate and consistent data, access to finance, and non-financial support are critical components in unlocking the potential for SMEs to contribute to global sustainability goals. With the right support and collaboration, SMEs can play a significant role in achieving a net-zero future, driving both economic growth and environmental sustainability.

[45] Grab, "Grab's ESG progress in 2023: Serving more people, better", June 2024, https://www.grab.com/sg/inside-grab/stories/esg-report-2023-driver-earnings-msmes-growth-accessible-ecosystem/

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