

MOVING THE PARADIGM IN ASEAN POLICIES, FINANCING & CORPORATE ACTIONS FOR GREEN ECONOMY

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ABSTRACT

Southeast Asia (ASEAN) is currently positioned at a critical inflection point regarding its environmental and economic trajectory. While the region is experiencing rapid economic growth, it faces the dual challenge of meeting rising energy demands—projected to increase by nearly 42% by 2030—while transitioning to a low-carbon economy. This paper analyzes the structural barriers hindering ASEAN's green transition, including a reliance on fossil fuels, high capital costs, and fragmented policy landscapes. Despite a 20% increase in green investments in 2023, funding levels remain significantly below the \$1.5 trillion required by 2030. Through an examination of three core dimensions—policy interventions, financial innovations, and corporate actions—this study identifies gaps and proposes a comprehensive roadmap. The research suggests that by aligning regional cooperation, implementing blended finance mechanisms, and fostering green industrial clusters, ASEAN can unlock an estimated \$300 billion in additional annual revenue by 2030.

Keywords: *ASEAN, Green Economy, Decarbonization, Blended Finance, Corporate Sustainability, Environmental Policy.*

Introduction

The ASEAN region is uniquely positioned at a critical inflection point. While there has been notable progress in green investments—with a 20% increase in 2023, reaching \$6.3 billion—the funding remains far short of the \$1.5 trillion needed by 2030 to achieve a meaningful transition. Additionally, fossil fuels still dominate the energy landscape, accounting for ~75% of the power mix, underscoring the urgent need for policy interventions, financial innovation, and corporate action.

This paper explores three core dimensions of the green transition in ASEAN:

- **Policies:** The role of government regulations, incentives, and carbon pricing mechanisms in accelerating decarbonization.
- **Financing:** Innovative financial mechanisms, including blended finance, carbon credits, and sustainability-linked investments, to mobilize capital.
- **Corporate Actions:** How businesses are adopting ESG-driven strategies, investing in clean energy, and participating in the carbon market to drive sustainable growth.

The study is structured to analyse the challenges and opportunities in these areas, drawing insights from industry reports, financial data, and policy documents. By identifying gaps and proposing solutions, this research aims to contribute to the ongoing dialogue on ASEAN's green economy transformation.

Ultimately, the transition toward sustainability in ASEAN is not just a climate necessity but an economic opportunity. Estimates suggest that the green economy could unlock \$300 billion in additional annual revenue by 2030, presenting a compelling case for immediate action.

The global imperative to transition toward a sustainable, low-carbon economy has never been more urgent. Southeast Asia (SEA), a region with a rapidly expanding economy and a rising middle class, faces a complex challenge: balancing economic growth with environmental sustainability. Despite the region contributing only ~7% of global emissions, its emissions are projected to rise significantly due to increasing primary energy consumption, which is expected to grow by nearly 42% by 2030. However, to fully realize this potential, regional cooperation, policy certainty, and corporate investment must align to create an ecosystem conducive to sustainable development.

This paper provides a comprehensive roadmap for ASEAN’s policymakers, financiers, and corporate leaders, outlining key strategies, case studies, and policy recommendations to facilitate a just and equitable green transition.

ASEAN’s Green Economy Landscape
Overview of ASEAN’s Decarbonization Progress

Southeast Asia's journey toward a low-carbon economy is shaped by contrasting dynamics: on one hand, rapid economic growth and a rising middle class are increasing energy demand, while on the other, governments and corporations are making ambitious commitments to decarbonization. The region’s primary energy demand is expected to increase by nearly 42% by 2030, which, if left unchecked, will significantly raise emissions.

Despite this challenge, ASEAN has made some progress:

- Four ASEAN countries have increased their climate commitments in the past year.
- Seven ASEAN nations are now considering carbon pricing mechanisms.
- Corporate commitments to science-based targets (SBTi) have quadrupled.
- Green investment grew by 20% in 2023, reaching \$6.3 billion, but still falls far below the required \$1.5 trillion by 2030.



However, emissions in Southeast Asia are still rising: the region witnessed a 13% increase (or 400 MtCO₂e) in 2023 alone. Renewable energy investments increased by 9%, yet renewables constitute less than 10% of electricity generation. The key challenge remains: ASEAN needs to bend the emissions curve while maintaining economic growth. Without substantial policy and financial interventions, SEA will fall short of its 2030 and 2050 climate targets.

Structural Challenges Hindering ASEAN's Green Transition

Despite clear economic and climate benefits, ASEAN faces five structural barriers that hinder progress toward a net-zero economy:

Dual Need to Balance Growth & Transition

With a low GDP per capita (~\$6K in 2023, vs. \$63K in North America), ASEAN economies depend heavily on energy-intensive sectors. Economic growth will drive power demand up by ~50% by 2040, requiring massive infrastructure investments.

Legacy Fossil Fuel Dependence

~60% of Southeast Asia's coal power plants are under 20 years old, making it difficult to justify early retirements. The power sector remains 75% dependent on fossil fuels, making a rapid transition infeasible without alternative baseload power.

Uneven Opportunities & Limited Cooperation

Renewable energy potential is unevenly distributed, with grid constraints limiting solar and wind power deployment.

Lack of cross-border energy cooperation hinders the scalability of clean energy projects.

Limited Incentives for Carbon Reduction

- Fossil fuel subsidies remain widespread, making renewables less competitive.
- Investor pressure on carbon reduction remains weak, leading to slow adoption of ESG strategies.
- Inadequate Access to Green Financing
- Currency fluctuations, political instability, and regulatory uncertainty make projects in SEA riskier for global investors. Limited private sector participation in energy infrastructure due to government-controlled grids.

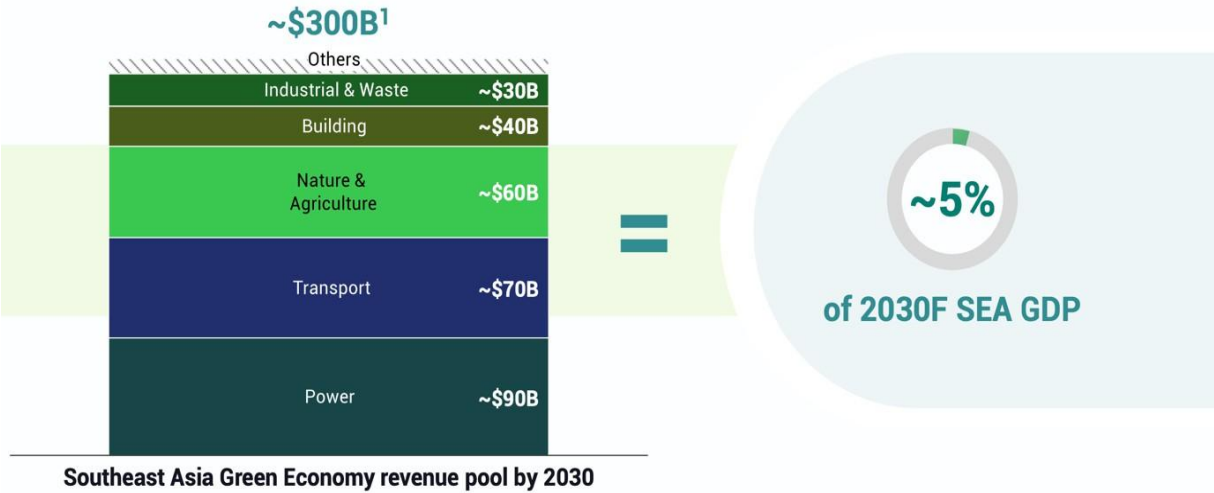
Without addressing these barriers, the region's green transition will remain constrained despite increasing climate commitments.

The Economic Opportunity in ASEAN's Green Economy

The transition to a green economy presents an enormous economic opportunity for ASEAN, extending beyond emissions reductions to unlock new revenue streams, job creation, and industrial modernization. If fully leveraged, ASEAN's green economy could generate an estimated \$300 billion in annual revenue by 2030, equivalent to approximately 5% of the region's projected GDP.

The development of renewable energy infrastructure, energy-efficient buildings, sustainable transportation systems, and circular economy initiatives will be key drivers of this growth.

Size of prize | Unlocking the region's green economy could be worth another \$300B annually by 2030



Breakdown of ASEAN’s Green Economy Revenue Potential by 2030

- **Green Fuel Sources** – Estimated at \$30 billion, green fuels such as biofuels and green hydrogen will play a crucial role in replacing conventional fossil fuels.
- **Energy-Efficient Buildings** – Worth \$40 billion, investments in energy-saving retrofits, smart grid technologies, and green building certifications will enhance efficiency.
- **Greener Transport** – Expected to generate \$60 billion, sustainable mobility solutions such as electric vehicles (EVs), high-speed rail, and biofuel-powered aviation will define ASEAN’s future transportation landscape.
- **Process Optimization & Industrial Efficiency** – Estimated at \$70 billion, improving industrial processes through energy efficiency, waste reduction, and automation will be essential for achieving sustainability targets.
- **Nature-Based Solutions & Carbon Markets** – The most significant opportunity, valued at \$90 billion, involves carbon credit trading, reforestation initiatives, and conservation projects.

To unlock these opportunities, governments and corporations must actively scale green investments, create financial incentives, and integrate sustainability into core business models. Without decisive action, ASEAN risks falling behind in the global green economy, missing out on both environmental and economic benefits.

Key Takeaways from ASEAN’s Green Transition Progress

Despite incremental progress, ASEAN’s green economy transition remains at an early stage, with substantial gaps in policy implementation, financing, and corporate adoption. The following takeaways highlight both the advances and persistent challenges in the region’s sustainability efforts:

Positive Developments

- 6 out of 10 ASEAN countries have introduced green taxonomies, carbon markets, or emissions reporting requirements, signifying regulatory advancements.
- 5 out of 10 top-emitting corporates have announced net-zero roadmaps, signaling a growing corporate commitment to sustainability.
- Private green investments in ASEAN doubled in 2023, reaching \$6.3 billion, driven by renewable energy projects and sustainable finance instruments.

Challenges That Must Be Addressed

- 20 out of the top 100 highest-emitting companies in ASEAN still lack structured decarbonization roadmaps, delaying emissions reductions.
- ASEAN requires \$1.5 trillion in cumulative investment by 2030, but current funding levels remain drastically inadequate.
- 75% of ASEAN's power generation remains dependent on fossil fuels, highlighting the urgent need for rapid energy transition policies.

ASEAN stands at a pivotal moment. To avoid falling short of its 2030 and 2050 climate targets, governments, financial institutions, and corporations must accelerate green investments, policy harmonization, and cross-border cooperation. The next sections explore policy mechanisms, financial strategies, and corporate actions that will be instrumental in scaling ASEAN's green transition.

Policies for Green Transition

The Role of Policy in ASEAN's Green Transition

A strong and coherent policy framework is essential to guide ASEAN's green transition, ensuring that regulations, incentives, and carbon pricing mechanisms align with sustainability goals. However, the policy landscape across ASEAN remains fragmented, with inconsistencies in emissions regulations, energy transition roadmaps, and corporate sustainability mandates.

Current Policy Landscape Across ASEAN

- **Energy Performance Standards** – Only 6 out of 10 ASEAN countries have implemented minimum energy performance standards (MEPS) for industries, but most require urgent updates to align with international best practices.
- **Carbon Pricing Mechanisms** – Only two ASEAN countries, Singapore and Indonesia, have implemented carbon taxes or emissions trading systems (ETS), while Thailand, Vietnam, and Malaysia are in early stages of development.
- **Green Taxonomies** – Some progress has been made, with ASEAN developing regional green finance standards, but inconsistent adoption across countries reduces market confidence.

Key Policy Gaps and Challenges in ASEAN

Despite growing climate commitments, ASEAN countries face major challenges in implementing effective sustainability policies:

Current situation: SEA is making progress on more comprehensive policies for the green economy yet more work needed on investment incentives and carbon pricing infrastructure

Disclosure and Standards	Incentives	Carbon Pricing
6/10 countries have implemented mandatory corporate disclosure	6/10 Countries have financial incentives for renewable energy, electric vehicles, and green buildings	2/10 Only Singapore and Indonesia have adopted carbon tax or emissions trading scheme (ETS) while another 3 countries are still developing their policies
4/10 countries have set legal mandates for renewable energy portfolio mix	0/10 Countries have large scale climate incentive programs through a mix of tax incentives, grants, and loan guarantees targeting specific sectors, like US Inflation Reduction Act (IRA)	5/10 Countries are developing domestic carbon market infrastructure, registries
6/10 countries participating in ASEAN Taxonomy	5/10 Countries continue to provide fossil fuels subsidies for end-use electricity, petroleum, coal and natural gas	
6/10 countries have set minimum energy performance standards (MEPS) but most require update (established with ~4 years lag ¹)		

Inconsistent and Uncertain Policy Frameworks

The absence of long-term regulatory clarity discourages private-sector participation in the green economy. Frequent changes to renewable energy incentives and emissions reporting requirements create investment uncertainty. For instance, Vietnam's abrupt adjustments to its solar feed-in tariff policies have disrupted investor confidence.

Limited Carbon Pricing Mechanisms

Carbon pricing is one of the most effective policy tools for incentivizing emissions reductions, yet adoption remains limited. Only Singapore and Indonesia have implemented a carbon tax or ETS, while other ASEAN nations remain hesitant due to concerns about industrial competitiveness and economic growth constraints.

Persistent Fossil Fuel Subsidies

Five ASEAN nations continue to subsidize fossil fuels, creating an uneven playing field where renewables struggle to compete. Indonesia, for example, maintains a coal price cap, keeping electricity prices artificially low and reducing incentives for transitioning to clean energy.

Slow Progress in Green Finance Incentives

Unlike the United States (IRA Act) and European Union (Fit for 55 Plan), ASEAN lacks a large-scale green industrial policy to provide targeted financial incentives for sustainable industries. Only six ASEAN countries currently offer targeted tax benefits for EVs, renewables, and green infrastructure, yet funding remains insufficient to drive large-scale deployment.

To accelerate ASEAN's green transition, governments must adopt bold and ambitious policies that prioritize decarbonization, energy efficiency, and financial incentives

Policy Recommendations for Accelerating the Green Transition

- To create a pro-business and pro-sustainability policy environment, ASEAN governments must enact the following strategic policy measures:
- Strengthen Carbon Pricing and Emissions Trading Systems
- Expand carbon taxes and ETS frameworks to at least six ASEAN nations by 2025.
- Align national carbon pricing systems with Article 6 of the Paris Agreement, allowing for cross-border carbon credit trading.

Scale Up Green Investment Incentives

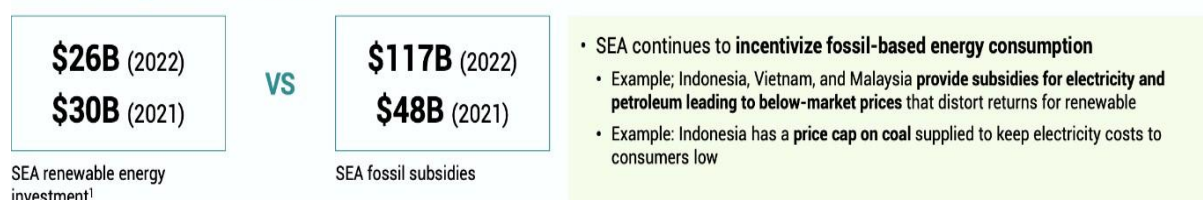
- Develop ASEAN-wide green industrial policies, mirroring the U.S. Inflation Reduction Act (IRA), to attract large-scale private investments.
- Introduce targeted subsidies, tax benefits, and concessional loans for renewables, EV production, and energy efficiency projects.

Reform Fossil Fuel Subsidies

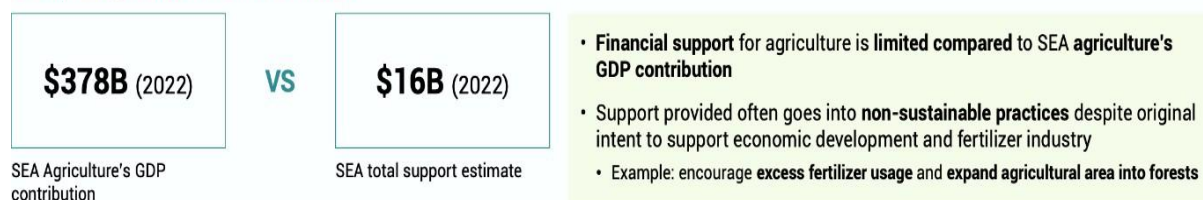
Phase out coal and petroleum subsidies and reallocate funds to renewable energy projects. Implement progressive carbon taxes to discourage continued fossil fuel dependency.

Incentives: SEA's fiscal incentives continue to remain limited and incongruent

Example: Energy incentives in SEA



Example: Agriculture incentives in SEA



Strengthen Regional Energy Cooperation

- Develop ASEAN-wide energy agreements to facilitate cross-border power grid integration, allowing nations with surplus renewable capacity to export electricity to energy-deficient neighbors.
- Introduce harmonized ESG reporting frameworks to increase transparency and encourage corporate accountability.
- By enacting these policies, ASEAN can enhance investor confidence, scale green financing, and accelerate renewable energy deployment. These strategic shifts will position ASEAN as a global leader in sustainable development while ensuring economic competitiveness.

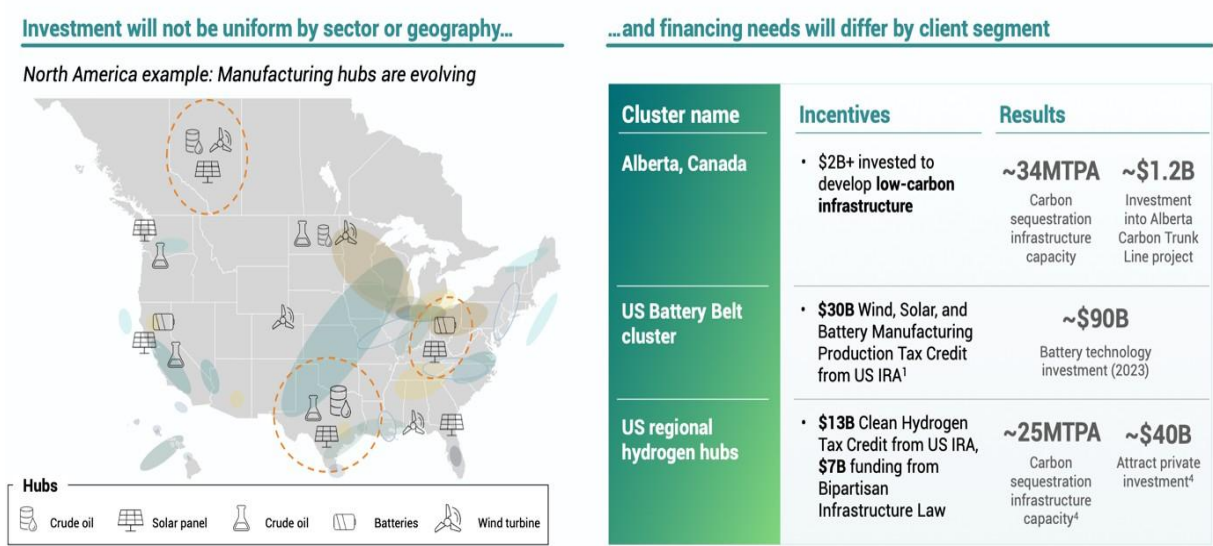
Cluster Development as a Policy Tool for Green Transition

Introduction to Cluster Development

Cluster development is emerging as a critical strategy for ASEAN to accelerate its green transition, particularly in industrial and energy-intensive sectors. Clusters—geographically concentrated groups of interconnected businesses, suppliers, and research institutions—allow for greater economies of scale, cost-sharing of green technologies, and the formation of knowledge ecosystems that enhance sustainability efforts.

As ASEAN economies work towards low-carbon industrialization, developing green industrial clusters can help nations reduce emissions, improve energy efficiency, and promote resource-sharing initiatives. These clusters can be applied to multiple sectors, including renewable energy, electric vehicle manufacturing, circular economy projects, and low-carbon industrial hubs.

Transition and adaptation spending will not be uniform; investments and financing requirements will vary widely by location, sector, and client segment



ASEAN's Existing Green Cluster Initiatives

Several ASEAN countries are already leveraging cluster-based development models to advance sustainability:

- **Malaysia's Green Industrial Clusters** – The Malaysian government has established sustainability-driven industrial clusters focusing on energy efficiency, green manufacturing, and waste reduction. These clusters provide a shared infrastructure for industries to integrate waste heat recovery, smart manufacturing technologies, and on-site renewable energy solutions.
- **Vietnam's High-Tech Parks & Sustainable Economic Zones** – Vietnam has introduced low-carbon industrial zones that prioritize energy efficiency, sustainable supply chains, and circular economy principles. Companies operating in these zones benefit from preferential tax policies and green financing mechanisms.
- **Thailand's EV Cluster Development Strategy** – Thailand is emerging as ASEAN's EV manufacturing hub, clustering battery producers, EV assembly plants, and supply chain partners in specialized economic zones. This model enhances R&D collaboration, economies of scale, and supply chain resilience.

While these clusters demonstrate progress, ASEAN must scale up cluster development efforts to drive cross-sectoral decarbonization and attract foreign direct investment (FDI) in green industries.

Economic demographics of SEA suggest targeting industrial clusters for green investment could accelerate impact and work around structural constraints



Benefits of Cluster-Based Sustainability Initiatives

Cluster development provides several strategic advantages for ASEAN's green transition:

- **Cost Efficiency & Economies of Scale** – Businesses in clusters share common infrastructure, reducing the cost of renewable energy adoption, waste management, and logistics.
- **Innovation & Knowledge Spillover** – Green clusters foster collaboration between corporations, research institutions, and technology providers, accelerating the deployment of low-carbon solutions.

- **Resource Sharing & Circular Economy Practices** – Industrial clusters enable waste- to-resource synergies, where one firm’s by-products serve as inputs for another, minimizing waste generation.
- **Improved Access to Green Finance** – Clusters are attractive investment zones for green bonds, blended finance, and government incentives, making it easier for companies to secure sustainable financing.

Policy Recommendations for Scaling Green Clusters in ASEAN

For cluster-based sustainability initiatives to reach their full potential, ASEAN governments should implement the following strategies:

- **Expand Green Industrial Clusters Across ASEAN Nations** – Governments should replicate successful models from Malaysia, Vietnam, and Thailand to establish dedicated low-carbon economic zones.
- **Introduce Preferential Financing & Incentives** – Special tax rates, concessional loans, and blended finance programs should be introduced to encourage corporate participation in green clusters.
- **Integrate Renewable Energy Infrastructure** – Clusters should be powered by on- site renewables, such as solar microgrids and battery storage systems, to lower carbon footprints.
- **Develop Regional Cross-Border Cluster Networks** – ASEAN should encourage interconnected green industrial hubs, allowing businesses to share clean technologies and supply chains across borders.

By scaling green clusters, ASEAN can accelerate the adoption of sustainability-focused business models, attract climate-aligned investments, and enhance regional competitiveness in low-carbon industries.

Financing the Green Economy

Southeast Asia's transition to a low-carbon and sustainable economy is dependent on a significant influx of capital to fund renewable energy projects, green infrastructure, sustainable agriculture, and carbon market developments. However, despite increasing recognition of the need for sustainability financing, the actual mobilization of funds remains far below the required levels. ASEAN requires an estimated \$1.5 trillion in cumulative investment by 2030, yet only \$6.3 billion was invested in green initiatives in 2023, a mere 0.5% of the necessary funding. The region faces an urgent need to close this financing gap through policy interventions, innovative financial instruments, and strategic private-sector engagement.

The challenges in securing green finance stem from high capital costs, limited investor confidence, regulatory uncertainty, and continued fossil fuel subsidies. Many countries in ASEAN have yet to create a sufficiently attractive investment landscape for large-scale green projects, resulting in a reliance on public financing, international development banks, and concessional loans. However, these funding sources alone cannot meet the region’s needs.

It is, therefore, crucial to scale up blended finance models, expand green bond markets, and strengthen carbon pricing mechanisms to facilitate the necessary shift toward sustainable investments.

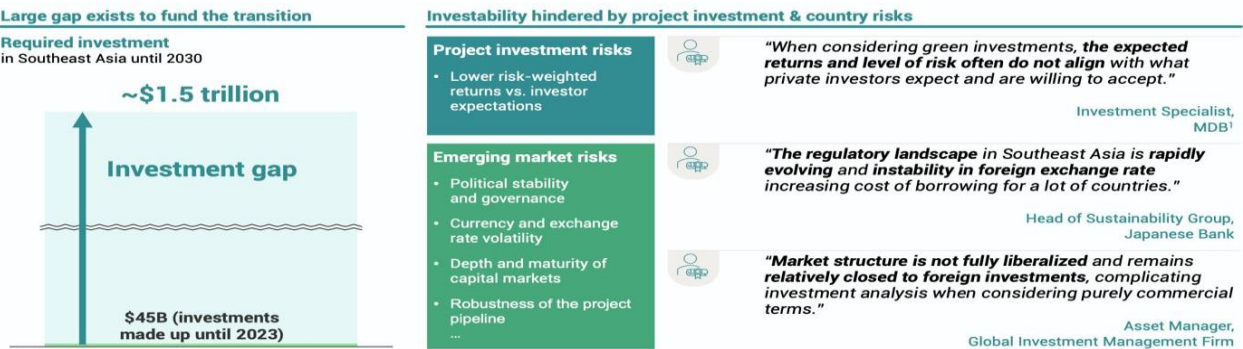
This section explores the financing challenges, emerging financial instruments, and key strategies that can enable ASEAN to unlock private capital, attract institutional investors, and accelerate its green economic transition.

The Investment Gap in ASEAN’s Green Transition

The financial gap in ASEAN’s sustainability transition is staggering. The region’s economies are heavily dependent on fossil fuels, which continue to receive significant government subsidies, making renewable energy projects less financially attractive despite their long-term economic and environmental benefits. While green investment in ASEAN grew by 20% in 2023, it remains a fraction of the \$1.5 trillion required to meet its climate goals by 2030.

One of the primary barriers is the high cost of capital for green investments. Unlike in developed markets, where interest rates for renewable energy projects range from 3–5%, the cost of capital in ASEAN is significantly higher at 10–12%. This makes financing green initiatives prohibitively

Scaling capital flows into the green economy constrained by multiple factors



expensive, limiting the participation of both local and international investors.

Another major roadblock is the lack of long-term policy certainty. Investors require clear, stable, and predictable regulatory frameworks to justify large-scale capital deployment in renewable energy, carbon credit markets, and energy efficiency initiatives. However, ASEAN governments have inconsistently implemented renewable energy feed-in tariffs, tax incentives, and carbon pricing mechanisms, deterring large-scale private investment.

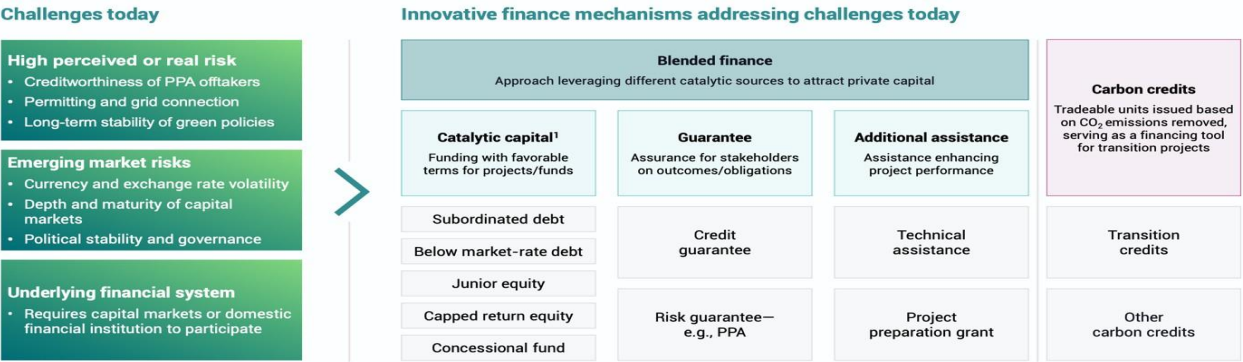
Additionally, the uneven development of financial markets in the region contributes to the slow uptake of green finance. Many ASEAN countries lack deep capital markets, limiting the availability of green bonds, sustainability-linked loans, and ESG-focused investment products.

As a result, green finance remains heavily reliant on multilateral institutions such as the Asian Development Bank (ADB), the World Bank, and regional development funds rather than being driven by private capital markets. Without addressing these systemic financial challenges, ASEAN will struggle to scale the investments required for decarbonization, delaying its ability to meet climate targets while increasing long-term economic risks from climate change.

Key Sources of Green Finance in ASEAN

While ASEAN faces major financing challenges, a range of financial instruments and mechanisms have emerged to support the green transition. Expanding these sources and improving accessibility to sustainable finance will be critical in accelerating investments in renewables, clean infrastructure, and carbon offset projects.

Solutions: SEA funds and banks are starting to address financing challenges via innovative mechanisms like blended finance and carbon credits



Blended finance is an essential tool for scaling green investments in ASEAN, as it leverages public and philanthropic capital to reduce investment risks, making green projects more attractive to private investors. By combining concessional funding from development banks and government-backed guarantees, blended finance helps de-risk large-scale projects that would otherwise be too risky for private capital.

Notable Blended Finance Projects in ASEAN:

ADB’s \$692 million Laos Wind Project (2023) – This project combined grants, concessional loans, and private investment to develop one of Southeast Asia’s largest wind farms, proving that risk-sharing mechanisms can successfully attract capital.

Case study #1: ADB Laos Wind Project

Case study highlight		Catalytic capital and guarantee of future revenue via PPA ¹ played major roles in de-risking the investment and attracting private investors					
Project overview	In March 2023, ADB ² led financing structuring and packaging \$692M loan financing for 600 MW Monsoon onshore wind project in Laos	\$60M size of catalytic capital initially raised to mobilize the investment Catalytic capital from JICA ³ (\$20M), CFPS ⁴ (\$30M), and ADB (\$10M)	Plans to finish construction and begin operation of wind farm in year 2025 PPA signed with Vietnam Electricity	Project shareholder			
				Lender	Developer		
				CFPS	JICA	ADB	BCPG
				Kasi-korn	SMBC ⁵	SCB ⁶	IES ⁷
							Mitsubishi Corp.
Challenge & enabler	Challenge		How it was addressed				
	Hard to attract investors due to low return nature	Longer time to realize return prevents green deals from investments Due to the characteristic of infrastructure investment that has long duration for return	1. Catalytic capital	2. Guarantee	Additional assistance	Carbon credit	
			1 Below-market rate loan and grant lowered capital costs	2 Future volume guarantee provided			
			\$693M Private cap. (\$150M) Public cap. (\$493M)	Market rate return Catalytic (\$60M) Below-market rate	Make project bankable for investors through catalytic capital, including loan and grant	Signed 25-years-long PPA with Vietnam Electricity	Provide investors assurance as future revenue is guaranteed, thus providing certainty on expected returns

Penta green Capital's \$100 million Philippine Solar Project (2023) – A mezzanine finance model was used to develop 490 MW of solar capacity, illustrating how blended finance can unlock large-scale renewable investments.

Case study #2: Pentagreen Capital Philippines solar project

Case study highlight		Pentagreen Capital provided mezzanine debt to Citicore Solar Energy Corporation ("CSEC") at its HoldCo level to finance greenfield assets held at its SPV ¹ level			
Project overview	In September 2023, Pentagreen Capital structured a \$100 million Mezzanine Construction Green Loan Facility and committed an initial tranche of \$30 million with CSEC	CSEC is a holding company which owns interest in dedicated Asset SPVs which in turn shall raise project finance debt from a mix of local banks and international project finance lenders—Pentagreen's loan is structurally subordinated to the senior secured project finance debt at the Asset SPV level	The debt will finance a portfolio of six solar power projects with gross capacity of 490 MWs with option to increase the committed amount to \$100 million to fund additional greenfield solar projects		
Challenge & enabler	Challenge - Bankability constraint in early construction phase infrastructure projects - Subordinated debt is too high risk for commercial banks - Too "greenfield" (assets in construction) for private credit		How it was addressed		
			<table><tr><td>1. Catalytic capital</td><td>Guarantee</td><td>Additional assistance</td><td>Carbon credit</td></tr></table> 1 Improved the bankability of the situation Pentagreen is a non-bank financial institution with a balance sheet that is able to take and price subordinated risk appropriately; it also has the know-how around construction risk mitigation Despite improved bankability, it is only with further blended finance can such deals be sufficiently de-risk for banks/institutional investors and be funded repeatedly to fill infrastructure investment gaps	1. Catalytic capital	Guarantee
1. Catalytic capital	Guarantee	Additional assistance	Carbon credit		

Blended finance remains underutilized across ASEAN, with governments and financial institutions needing to expand its adoption through policy frameworks that provide de-risking incentives for private investors.

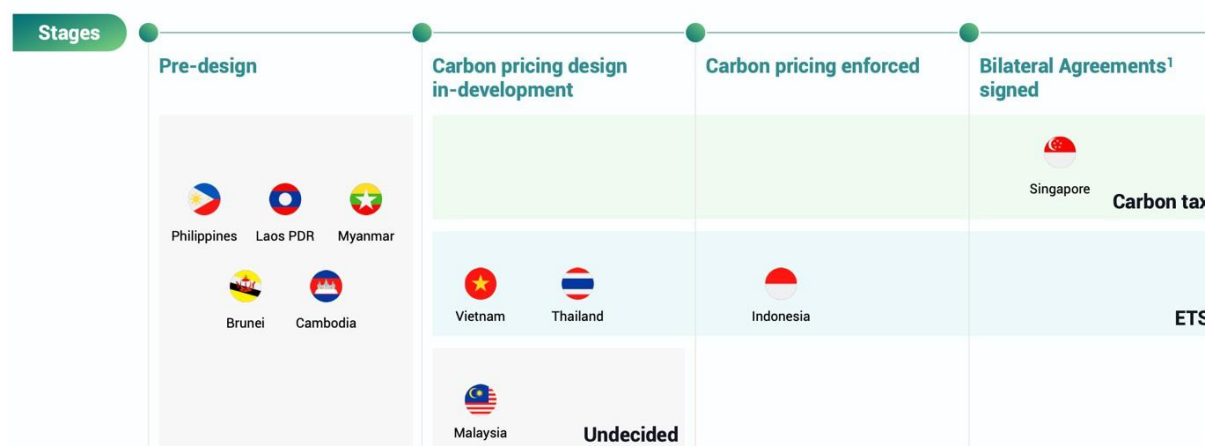
Carbon Markets and Transition Credits: Monetizing Emissions Reductions

Carbon markets are another emerging source of green finance in ASEAN. By placing a monetary value on carbon emissions, these markets allow companies, investors, and governments to trade carbon credits, generating revenue that can be reinvested in sustainable projects.

- Current Carbon Pricing Landscape in ASEAN:
- Singapore and Indonesia have implemented national carbon pricing mechanisms.

- Thailand and Vietnam are piloting Emissions Trading Schemes (ETS).
- Malaysia is designing a framework for future carbon credit trading.

Carbon pricing: SEA is making steady progress on carbon pricing related policies



However, carbon pricing remains limited in scale, covering only 6% of regional emissions, with weak enforcement mechanisms and limited cross-border trading options. Expanding carbon markets and improving regulatory certainty will be critical in making carbon financing a viable long-term investment tool.

Carbon pricing: Many countries are considering how to implement carbon pricing and markets

Country	System	Coverage	Country's journey	Results
Singapore	Carbon tax	Covers ~80% of GHG emissions	2015 to 2019: Develop carbon pricing strategy 2019: Introduce carbon tax on large emitters 2024: Allow 5% of emissions to be offset with international carbon credits to facilitate international alignment	Aim to support Singapore's net-zero target by 2050
Indonesia	ETS	Covers ~36% of GHG emissions	2018: Publish MRV¹ guideline for power after emissions profile and cost study; examine instrument options and conduct stakeholder consultations 2021: Issue national framework for carbon pricing 2023: Launch mandatory ETS for power sector	Expect reduction of 500,000 tCO ₂ e ² in power sector in 2023
Thailand	ETS	In development with initial target on GHG-intensive industrial sectors	2013: Develop pilot MRV¹ system with industrial sectors 2018: Establish mandate to design pricing instruments 2022: Conduct capacity building activities 2023: Authorized and transferred the world's first ITMOs from a bus electrification project with Switzerland.	Aim to support commitment to reduce emissions by 20.8% by 2030
Vietnam	ETS	In development with initial target on steel, cement, thermal power	2021: Establish mandate to design national crediting mechanism (NCM) and a domestic ETS 2022: Outline implementation roadmap for sectors 2023: Plan to establish ETS in 2028; signed Article 6.2 agreements with Japan, Singapore, and South Korea	Not applicable
Malaysia	Undecided	Under discussion to design framework	2021: Engage state governments and corporate sector with aim to align policies and regulation 2023: Conduct study to develop design framework	Not applicable

Green Bonds and Sustainability-Linked Loans: Unlocking Institutional Capital

Green bonds and sustainability-linked loans (SLLs) have become one of the fastest-growing sources of sustainable finance in ASEAN. These instruments enable companies and governments to raise capital specifically for climate-focused projects, such as renewable energy, infrastructure modernization, and electric vehicle expansion.

Recent Developments in ASEAN's Green Bond Market:

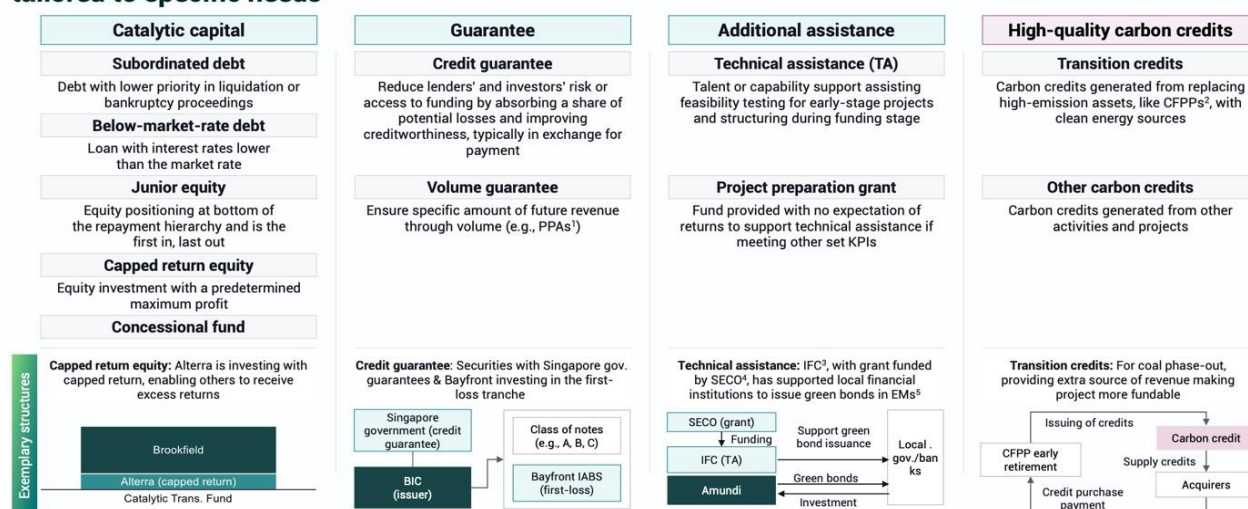
- Penta green Capital, Amundi, and IFC have launched major blended finance-backed green bond programs in ASEAN.

- ASEAN governments have started issuing sovereign green bonds, yet corporate participation remains low due to limited ESG disclosure mandates.
- Scaling up green bonds and sustainability-linked financing requires greater regulatory standardization, improved transparency, and stronger financial incentives to encourage corporate participation.

Financial Innovations to Scale Green Investments

Given ASEAN's massive financing gap, governments and financial institutions must expand financial innovation strategies that improve the bankability of green projects and attract institutional investors.

Innovative finance structures can vary depending on the fund or project, with different catalytic funds tailored to specific needs



Scaling Blended Finance for High-Risk Sectors

- Governments should increase public-private partnerships (PPPs) to reduce investment risks.
- Development banks must expand credit enhancement tools, such as first-loss guarantees and interest rate subsidies.
- Expanding Regional Carbon Markets and Transition Credits
- Establishing an ASEAN-wide emissions trading system (ETS) would improve liquidity and attract global investors.
- Creating incentives for corporate carbon offset participation will enhance capital mobilization.
- Lowering Capital Costs for Green Investments
- Governments should introduce tax incentives for renewable energy investments.
- Expanding cross-border green finance mechanisms will help attract international capital.
- By implementing these financial innovations, ASEAN can accelerate green investments while ensuring long-term economic resilience.

Corporate Actions for Sustainability

The role of corporations in driving ASEAN's green economy transformation cannot be overstated. While policies and financing mechanisms establish the regulatory and economic frameworks for sustainability, it is ultimately corporate actions that will determine the pace and success of decarbonization efforts. Businesses across ASEAN's manufacturing, energy, agriculture, and transport sectors are some of the largest contributors to emissions, making their active participation in the green transition essential.

Corporate sustainability is no longer just a voluntary commitment—it has become a competitive necessity. Investors, regulators, and consumers are increasingly demanding stronger environmental, social, and governance (ESG) commitments from businesses. Global capital markets are rewarding companies with robust sustainability strategies through increased funding opportunities, while firms failing to act face growing regulatory scrutiny and reputational risks.

Despite this, corporate decarbonization efforts in ASEAN remain uneven. While some multinational firms and regional leaders have embraced net-zero commitments, a significant portion of high-emission companies still lack structured transition plans. This disparity highlights a critical challenge: how to scale sustainability practices beyond leading firms to the broader corporate ecosystem.

This section explores the state of corporate ESG adoption, key decarbonization strategies, barriers to corporate sustainability, and strategic solutions for businesses to accelerate the transition to a low-carbon, resource-efficient economy.

The Role of Corporations in ASEAN's Green Transition

As one of the world's fastest-growing economic regions, ASEAN is home to thousands of corporations spanning energy production, heavy industry, agriculture, and logistics— each playing a pivotal role in shaping the region's emissions trajectory. Corporate emissions make up the bulk of ASEAN's carbon footprint, particularly in energy-intensive industries such as cement, steel, oil refining, and manufacturing. However, despite the urgency of climate action, corporate sustainability remains a work in progress.

Corporate challenge in SEA: Unique characteristics of SEA today limit incentives for many corporates to accelerate green investments near term

Policy volatility, limited stakeholder pressure, and high business risks result in few SEA corporate commitments



The Current State of Corporate Sustainability in ASEAN

Recent research on corporate climate commitments in ASEAN reveals a mixed picture:

- 5 out of the top 10 highest-emitting corporations in the region have announced climate targets or are in the process of developing net-zero strategies.
- However, 20 out of the top 100 largest emitting firms in ASEAN still lack structured decarbonization plans, indicating slow progress in major industrial sectors.
- Only 6 out of 10 ASEAN countries currently mandate corporate ESG disclosures, meaning a significant portion of businesses operate without formal sustainability reporting requirements.

The absence of regulatory pressure and financial incentives for corporate sustainability means that many companies still view green investments as an optional expense rather than a strategic necessity.

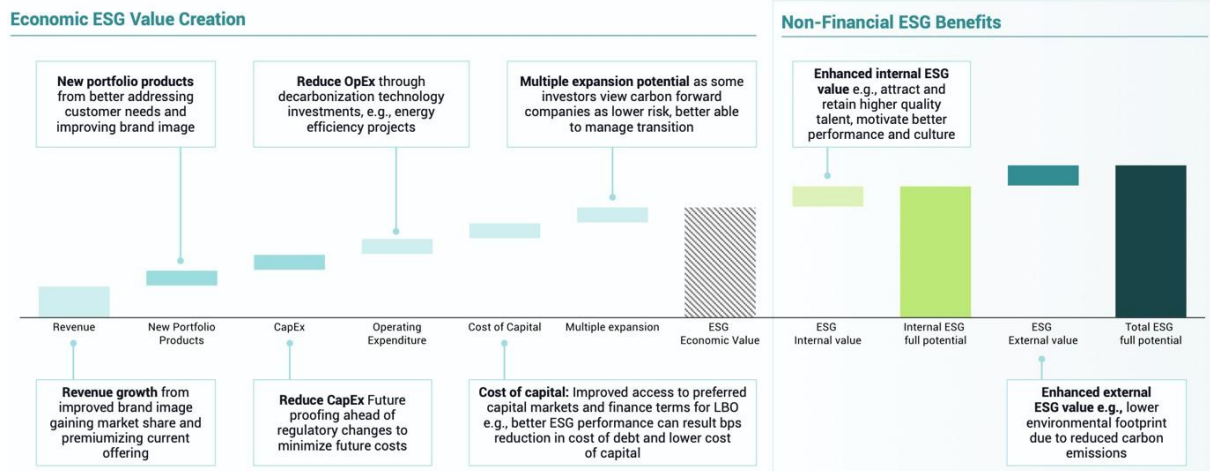
Companies that fail to incorporate sustainability into their business models risk not only regulatory penalties but also higher financing costs, supply chain disruptions, and loss of market competitiveness. In contrast, early adopters of ESG principles are benefiting from greater investor confidence, lower operational costs, and stronger customer loyalty.

To fully integrate corporate action into ASEAN's green transition, businesses must move beyond incremental sustainability improvements and adopt transformational strategies that align with regional and global decarbonization goals.

Decarbonization Strategies Adopted by Leading Corporates

Several companies in ASEAN, particularly those with global investor backing or export-driven supply chains, have already implemented advanced sustainability strategies. These firms serve as models for how corporations can decarbonize operations while maintaining profitability and competitiveness.

Leading corporates globally are investing across green themes for rationale reasons



Renewable Energy Adoption and Electrification

One of the most effective ways for businesses to reduce emissions is by switching from fossil fuels to renewable energy sources. ASEAN has seen increased corporate adoption of solar, wind, and hydroelectric power, particularly in technology, real estate, and consumer goods sectors.

Examples of Corporate Renewable Energy Leadership in ASEAN:

- Microsoft and Google have committed to running their ASEAN data centres on 100% renewable energy, investing in green grid infrastructure and power purchase agreements (PPAs).
- Unilever and Nestlé are working towards 100% renewable-powered manufacturing facilities in Vietnam, Indonesia, and Thailand.
- Thailand is emerging as a regional leader in electric vehicles (EVs), with companies such as VinFast and BYD investing in EV production to phase out fossil fuel-based transportation.

Scaling corporate renewable energy procurement is crucial for ASEAN's energy transition, as businesses account for a significant share of electricity consumption in the region.

However, grid instability, high upfront costs, and limited policy support still pose barriers to corporate renewable adoption.

Industrial Process Efficiency and Circular Economy Initiatives

Manufacturers and industrial firms are increasingly investing in energy efficiency upgrades and circular economy practices to lower emissions. Process optimization—such as heat recovery systems, low-carbon cement production, and smart manufacturing technologies—is gaining traction.

Key Corporate Actions:

- Malaysia's Green Industrial Clusters promote industrial efficiency by integrating

- waste heat recovery and smart automation.
- Indonesia's Just Energy Transition Partnership (JETP) is working with private companies to phase out coal-dependent industrial production.
- Leading consumer brands such as P&G and Danone are implementing circular economy models, reducing waste and using recycled materials in packaging and production.

While these efforts represent progress, broader adoption is needed, particularly among small and medium enterprises (SMEs), which make up a large portion of ASEAN's economy but often lack the resources to invest in sustainable technologies.

Participation in Carbon Markets and Offset Programs

Some corporations have begun integrating carbon offset mechanisms and voluntary carbon markets into their net-zero strategies.

Examples of Corporate Carbon Market Participation:

- Singapore's carbon market initiatives allow businesses to purchase and trade carbon credits, incentivizing emissions reductions.
- Vietnam and Thailand have piloted voluntary carbon credit systems, encouraging corporates to fund nature-based solutions such as reforestation and wetland restoration projects.
- However, participation in carbon markets remains limited, as many companies are hesitant due to uncertainty in carbon pricing regulations and the risk of greenwashing accusations.

To strengthen corporate engagement in carbon markets, governments must establish transparent regulatory frameworks that ensure integrity, credibility, and scalability of carbon credit trading.

Challenges Limiting Corporate Green Investments

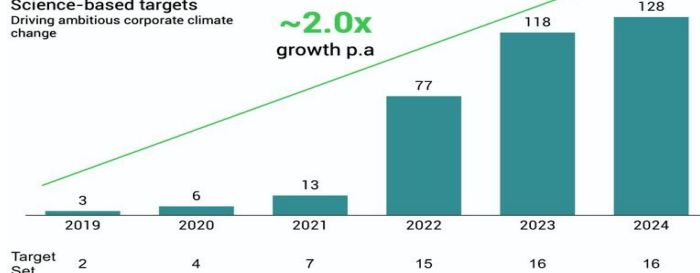
Despite growing awareness of sustainability imperatives, corporations in ASEAN continue to face substantial barriers to implementing full-scale decarbonization strategies.

Corporate challenge: More SEA corporates committing to decarbonization; struggling how to deliver

More companies in SEA are setting or committing to SBTi targets

SEA companies SBTi committed or targets set¹
(2019–2023, accumulative)

Science-based targets
Driving ambitious corporate climate
change



Yet many plans are losing SBTi validation

18% Out of 49 companies dropped from SBTi commitment list in Asia, 9 were in SEA

Unless continuous efforts are made, SBTi validation could be gone/rejected

To keep SBTi's framework robust, SBTi has put in place a policy to reassess firms that do not have commitments and targets that can withstand scrutiny

Asian companies are struggling more than others to build plans and targets for net zero

Asian companies have challenges to set realistic plans and targets for reasons like limited understanding of scope, ability to fund transition projects, etc.

Weak Regulatory Pressure and ESG Disclosure Mandates

- Many businesses still view sustainability as voluntary due to limited enforcement of ESG disclosure regulations.
- Lack of standardized corporate carbon reporting frameworks makes it difficult for investors to compare climate commitments across industries.

High Capital Costs for Green Investments

- Many businesses face significant upfront costs in transitioning to renewable energy, electric fleets, and circular manufacturing models.
- Interest rates for green loans remain high, making it difficult for firms—especially SMEs—to finance sustainability upgrades.

Limited Carbon Pricing and Offsetting Incentives

With only two ASEAN countries (Singapore and Indonesia) implementing carbon pricing, there is little financial motivation for businesses to cut emissions.

Many carbon markets in the region remain underdeveloped and lack transparency, discouraging corporate participation.

Addressing these challenges will require stronger policy incentives, better access to green financing, and greater corporate accountability.

Conclusion & Policy Recommendations

Southeast Asia stands at a critical inflection point in its economic and environmental trajectory. As the region continues to experience rapid industrialization, urbanization, and energy demand growth, it simultaneously faces the urgent challenge of decarbonization to mitigate the impacts of climate change and ensure long-term economic resilience. The transition to a sustainable, green economy is no longer just an environmental necessity; it has become an economic imperative.

This paper has explored three core dimensions of ASEAN's green transition: policy frameworks, financing mechanisms, and corporate actions. While some progress has been made, the pace of transition remains slow, hindered by regulatory uncertainty, financing constraints, and corporate inertia. Without a concerted effort to align policy, investment, and business strategies, ASEAN risks falling behind global sustainability trends, missing economic opportunities, and exacerbating environmental degradation.

The following sections summarize the key findings of this research and present actionable recommendations for governments, financial institutions, and corporations to accelerate ASEAN's transition to a low-carbon, resilient economy.

Key Takeaways from ASEAN's Green Economy Transition

Progress Made

- Despite challenges, there has been notable progress in ASEAN's green transition:
- 6 out of 10 ASEAN countries have made strides in implementing green taxonomies, emissions reporting standards, or carbon markets.
- Private green investments doubled in 2023, reaching \$6.3 billion, signalling growing investor confidence in sustainable projects.
- ASEAN's green economy could generate an estimated \$300 billion in annual revenue by 2030, providing new economic opportunities across multiple sectors.

Gaps That Must Be Addressed

- \$1.5 trillion in cumulative investment is still required by 2030, with current financing mechanisms falling drastically short.
- Only 5 out of the top 10 highest-emitting corporates in ASEAN have published net-zero roadmaps, highlighting slow corporate engagement.
- 75% of ASEAN's energy mix remains fossil fuel-dependent, underscoring the need for stronger policy interventions and investment incentives.

ASEAN cannot afford to delay action. Governments, financial institutions, and corporations must work together to accelerate the region's sustainability transformation.

Policy Recommendations for ASEAN's Green Economy

Government policies set the foundation for private investment and corporate engagement in the green transition. ASEAN governments must implement stronger regulatory frameworks, phase out fossil fuel dependencies, and create incentives for sustainable investments.

Strengthening Carbon Pricing & Market Mechanisms

A robust carbon pricing system creates financial incentives for emissions reduction. However, only two ASEAN nations (Singapore and Indonesia) currently have carbon taxes or ETS programs. Expanding carbon pricing across the region is essential to:

- Ensure polluters bear the cost of emissions, driving investment into clean energy alternatives.
- Encourage corporate participation in carbon markets, increasing liquidity and scaling carbon offset initiatives.
- Harmonize regional carbon trading systems, allowing cross-border carbon credit exchanges under ASEAN-wide emissions trading schemes.

Scaling Up Green Finance & Investment Mechanisms

Closing ASEAN's \$1.5 trillion investment gap will require scaling innovative financial mechanisms such as:

- Blended finance models, which de-risk green investments by combining public and private capital.
- Green bonds and sustainability-linked loans, which encourage businesses to commit to emissions reduction targets in exchange for favourable financing terms.
- Government-backed credit guarantees and tax incentives, which lower financing costs for renewables, green buildings, and electric mobility projects.

Phasing Out Fossil Fuel Subsidies & Accelerating Renewable Energy

Fossil fuel subsidies remain a major barrier to ASEAN's green transition, making coal, oil, and gas artificially cheap while discouraging investment in renewables. Governments must:

- Phase out fossil fuel subsidies gradually while reallocating funds to renewable energy and energy efficiency initiatives.
- Implement transition incentives such as feed-in tariffs, tax credits, and power purchase agreements (PPAs) to accelerate clean energy deployment.
- Expand cross-border renewable energy trade, such as the ASEAN Power Grid, to
- increase energy security and diversify supply sources.

Strengthening Corporate ESG Regulations & Reporting Standards

Mandatory ESG disclosures are necessary to increase transparency and accountability in corporate sustainability commitments. Governments should:

- Mandate climate risk disclosures for large corporations by 2026.
- Enforce net-zero commitments with clear penalties for non-compliance.
- Standardize ESG reporting frameworks across ASEAN to ensure consistent sustainability assessments for investors.
- By adopting these policy measures, ASEAN governments can unlock investment certainty, drive corporate action, and establish the region as a leader in the global green economy.

Strategic Recommendations for Corporate & Financial Stakeholders

Corporations and financial institutions must align their business models and investment strategies with ASEAN's sustainability goals. Companies that fail to act risk higher regulatory penalties, reputational damage, and exclusion from global supply chains.

Corporate Sector: Strengthen Decarbonization Commitments

Businesses must move beyond voluntary pledges and integrate science-based emissions reduction targets into their long-term strategies. This includes:

- Switching to 100% renewable energy through power purchase agreements (PPAs).
- Investing in energy efficiency and sustainable supply chains to reduce Scope 3 emissions.
- Participating in carbon markets to offset residual emissions and enhance sustainability performance.
- Financial Institutions: Scale Green Finance & Investment

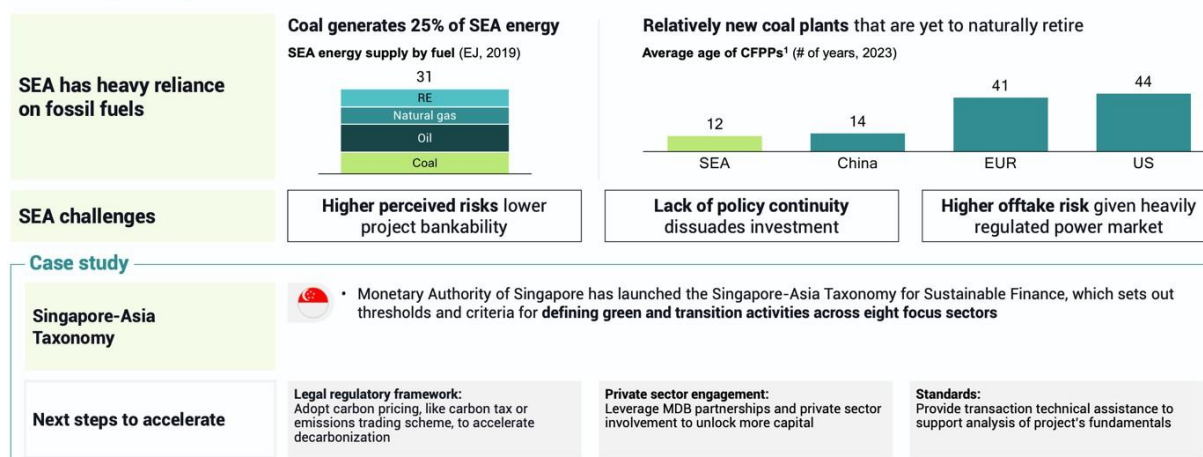
Banks, asset managers, and development institutions must accelerate capital deployment into green projects by:

- Issuing green bonds and sustainability-linked loans at preferential rates for climate-aligned businesses.
- Supporting blended finance structures to de-risk investments in emerging clean technologies.
- Integrating climate risk assessments into lending and investment decisions to ensure financial stability.

Regional Cooperation: Align Policy & Financing Strategies

ASEAN nations must coordinate policies, financial instruments, and corporate incentives to create a unified green economy. This includes:

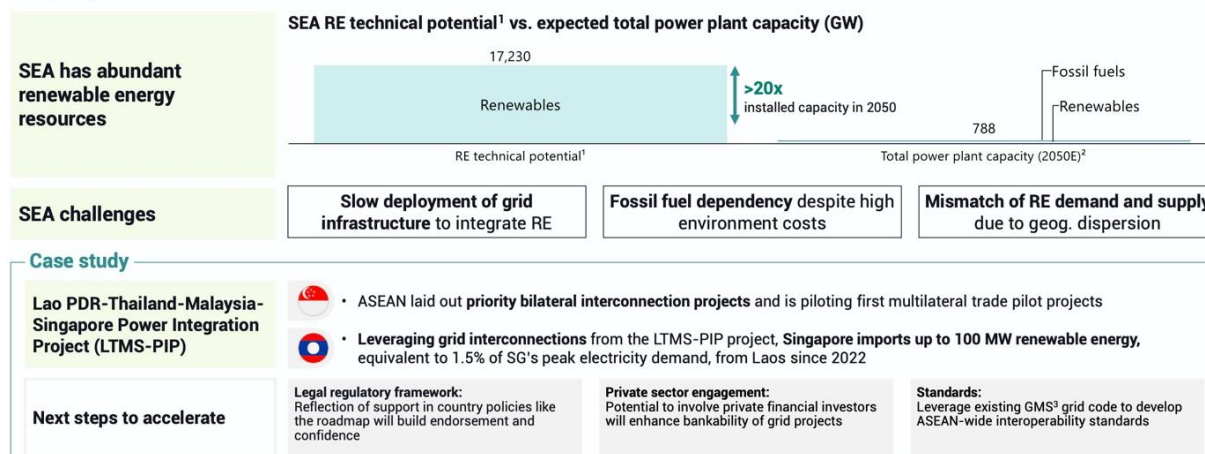
Taxonomy: Aligning approaches on transition and green finance will further help to build the financing ecosystem and drive returns for all stakeholders



- Developing an ASEAN-wide green finance taxonomy to standardize investment criteria.
- Establishing regional emissions trading schemes to encourage cross-border carbon trading.
- Facilitating technology and knowledge-sharing to promote best practices in sustainability innovation.

By aligning corporate, financial, and policy strategies, ASEAN can accelerate its green transition while ensuring long-term economic resilience.

Regional cross-border grid: A regional grid can unlock even greater renewables potential while helping reduce intermittency risks in any renewables transition



Conclusion: A Call to Action for ASEAN's Green Future

ASEAN's shift toward a low-carbon, sustainable economy is both a necessity and an opportunity. With the right policy frameworks, investment mechanisms, and corporate commitments, the region can achieve significant emissions reductions while fostering economic growth. The transition to a green economy could unlock \$300 billion in additional annual revenue by 2030, positioning ASEAN as a leader in clean energy, sustainable infrastructure, and ESG-driven business models.

However, the window for action is narrowing. Without decisive policy reforms, financial mobilization, and corporate leadership, ASEAN risks falling behind global sustainability benchmarks and facing mounting climate-related economic losses. Governments, businesses, and financial institutions must act now to ensure a sustainable, resilient, and prosperous future.

SEA region made a step forward but still has long way to go

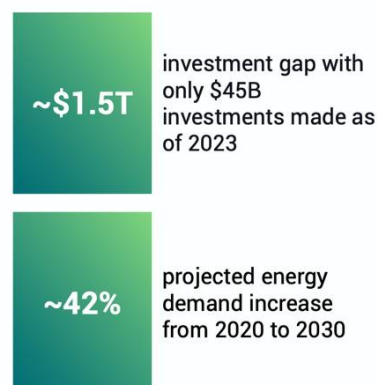
SEA countries have raised commitments on carbon ...



... and momentum is moving forward in the region ...



... yet still faces difficulties to reduce emissions and reach net-zero targets



ASEAN's Green Economy Roadmap: 2025–2030

By 2025: Foundational Reforms & Early Implementation

Establish Regional Carbon Pricing Alignment and Emissions Trading Schemes (ETS)

- ASEAN nations must introduce standardized carbon pricing frameworks, ensuring alignment between carbon taxes and emissions trading schemes (ETS).
- Countries like Singapore and Indonesia already have ETS mechanisms in place, but by 2025, at least four additional ASEAN countries (Thailand, Vietnam, Malaysia, and the Philippines) should establish carbon markets.
- A regional ETS framework will encourage cross-border carbon credit trading, increasing market liquidity and corporate participation.

Scale Blended Finance Programs to Accelerate Private-Sector Investment

- Blended finance models (a mix of public, private, and concessional capital) should be expanded to de-risk green investments and encourage greater corporate participation.
- Governments should work with multilateral institutions (e.g., ADB, IFC, World Bank) to establish investment funds for large-scale renewables, sustainable infrastructure, and low-carbon industrial development.
- Key sectors to prioritize include solar and wind power, electric mobility, industrial energy efficiency, and nature-based carbon sequestration projects.
- Implement Mandatory ESG Reporting for Publicly Listed Companies
- ASEAN regulators should make ESG disclosures mandatory for all publicly listed firms, ensuring that investors have transparent, standardized climate risk data.
- This will allow financial institutions to prioritize lending to companies with credible sustainability strategies, increasing access to green capital.
- ASEAN countries with existing ESG disclosure requirements (e.g., Singapore, Malaysia, Thailand) should harmonize reporting standards to allow for cross-border investment transparency.

By 2027: Policy Expansion & Market Integration

Expand Cross-Border Renewable Energy Integration to Increase Grid Efficiency

- ASEAN's power grids should be interconnected, allowing energy trade between countries with surplus renewable capacity (e.g., Laos, Vietnam) and high-demand markets (e.g., Indonesia, Thailand, Malaysia).
- The ASEAN Power Grid initiative should be fully operational, enabling the transmission of hydropower from Laos, solar power from Vietnam, and wind energy from the Philippines to neighboring countries.
- Governments must also harmonize grid regulations to allow seamless cross-border energy transactions, ensuring that renewables can replace coal-based electricity imports.

Ensure at Least 50% of New Corporate Financing is Sustainability-Linked

By 2027, at least half of all corporate financing deals (loans, bonds, credit facilities) should be linked to sustainability metrics.

This can be achieved through incentives for sustainability-linked loans (SLLs) and green bonds, rewarding companies that meet science-based emissions reduction targets.

Financial institutions should require climate risk stress testing before approving corporate loans, preventing capital from flowing into carbon-intensive projects.

Phase Out at Least 50% of Fossil Fuel Subsidies, Redirecting Funds to Clean Energy

Governments should eliminate at least half of all fossil fuel subsidies that artificially lower the cost of coal, oil, and gas, reallocating funds toward renewables, electric mobility, and industrial decarbonization programs. A progressive carbon tax structure should be introduced, making high-emission industries pay for their pollution while offering incentives for low-carbon transitions. Countries like Indonesia, Vietnam, and Malaysia, which still heavily subsidize coal and petroleum, should introduce gradual reductions in subsidy allocations, shifting financial support toward green innovation grants and low-carbon industrial transformation funds.

By 2030: Full-Scale Implementation & Sustainability Leadership

Reach \$1.5 Trillion in Cumulative Green Investment

ASEAN nations must mobilize a cumulative \$1.5 trillion in climate investments, covering renewable energy, sustainable transportation, energy efficiency, and carbon capture projects.

Governments and financial institutions should fully integrate blended finance models, ensuring that private capital flows into green economy sectors. Regional investment platforms should be scaled up, enabling institutional investors (pension funds, sovereign wealth funds) to deploy capital into ASEAN's green transition.

Increase Renewables to 40% of ASEAN's Energy Mix

ASEAN's power sector should be at least 40% renewable-based, reducing dependency on fossil fuels while maintaining energy security. Utility-scale solar, wind, hydro, and bioenergy must be deployed across ASEAN's major cities and industrial hubs, with large-scale battery storage infrastructure supporting intermittent renewable supply. Government-backed energy transition funds should support legacy industries (e.g., coal plants, oil refineries) in shifting toward green hydrogen, carbon capture, and electrified processes. Achieve Significant Reductions in Industrial and Transportation Sector Emissions

- By 2030, ASEAN must reduce industrial emissions by at least 30% through low-carbon manufacturing, green steel, and cement production.
- The adoption of electric and hydrogen-powered vehicles should be widespread, with major cities transitioning to zero-emission public transportation fleets.
- Carbon pricing mechanisms should be fully operational, covering at least 80% of industrial

emissions across ASEAN nations.

Translating ambition to action and results will take time; yet we know there are investable ideas and accelerators to leverage and speed up SEA's progress



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