ENERGY TRANSITION PARTNERSHIP

REPORT

Viet Nam's Green Transition in the New Context: Economic and Financial Priorities for 2026–2030

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DEPOCEN Development and Policies Research Center
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UNOPS AFD Federal Ministry for Economic Affairs and Climate Action Department for Energy Security & Net Zero Environment and Climate Change Canada / Environnement et Changement climatique Canada Australian Government Department of Climate Change, Energy, the Environment and Water CIFF CHILDREN'S INVESTMENT FUND FOUNDATION SEQUOIA CLIMATE FOUNDATION

Executive Summary

Viet Nam has entered a decisive phase in its pursuit of a green, resilient and competitive development pathway. The commitments set out in the updated Nationally Determined Contribution (NDC), the net-zero pledge for 2050, the Political Declaration of the 13th Party Congress, and the Socio-Economic Development Strategy 2021-2030 (SEDP) provide a strong strategic anchor. These national objectives are complemented by Viet Nam's participation in key global climate-finance initiatives, including the Just Energy Transition Partnership (JETP), the Political Partnership for Green Growth (P4G), most recently, the COP30 outcomes in Belém, which expanded global access to concessional finance, launched the Global Implementation Accelerator and tripled the scale of adaptation finance to 2035.

Amid this global momentum, Viet Nam faces the dual challenge of accelerating its green transition and avoiding a middle-income, middle-technology, high-carbon development trap. Viet Nam's energy intensity remains significantly above the global average; emissions in industry and transport continue to rise; climate-related trade barriers (EU CBAM, EUDR, supply-chain decarbonisation requirements) are tightening; and domestic green-finance architecture is still nascent. At the same time, Viet Nam's demographic window, supply-chain relevance and strong political commitment create a unique opportunity to position the country as a regional hub for green manufacturing, green services and sustainable finance.

This report offers crucial green growth policy priority recommendations for the 2026-2030 period. It will be circulated for public consultation at the Vietnam Economy and Finance Forum 2025, organized by the Ministry of Finance under the theme: ***'Shaping Viet Nam in the New Context: Strategic Vision of the Economy and Finance for the 2026-2030 Period.'*** The report argues that the green transition must be viewed not merely as a separate environmental agenda, but as the organising framework for Vietnam's next phase of economic and sustainable development. Consequently, the Ministry of Finance holds a decisive role in steering this transition through key levers, including investment and planning oversight, fiscal policy, public financial management, financial-sector regulation, and capital-market development.

1. Viet Nam's Green Transition: State of Play and Strategic Opportunities

Despite still being at an "emerging" stage on the global green-transition map, Viet Nam has built a relatively comprehensive strategic framework. Key pillars include the National Green Growth Strategy, the National Climate Change Strategy to 2050, the National Environmental Protection Strategy, the Power Development Plan VIII (PDP8), the national green taxonomy (Decision 21/2025/QD-TTg), and a series of sectoral plans in energy, transport, agriculture and industry. Together they provide a strategic direction for low-carbon growth and more sustainable patterns of resource use.

However, the energy system remains carbon intensive. Coal still accounts for around half of primary energy consumption and more than half of electricity generation; the most recent

data indicate that coal-fired generation represented roughly 46.2 percent of power output in the first 10 months of 2025, while renewable energy (solar and wind) contributed 12.1 percent (of which solar power accounted for 7.66%, wind power accounted for 4.09%) (MOIT, 2025). Viet Nam's carbon intensity reached approximately 0.28 kg of CO_2 per USD of GDP (PPP) in 2023, significantly higher than the global average of 0.19 kg CO_2/USD GDP. Over the period 1990-2023, Viet Nam's carbon intensity fluctuated between 0.12 and 0.30, with an average of around 0.21, indicating that emissions per unit of economic output have remained consistently high[1]. In 2023, the country's total CO_2 emissions were estimated at 373 million tons, reflecting a strong reliance on fossil fuels within the energy system and a production structure that remains carbon-intensive. These figures demonstrate that Viet Nam's growth model continues to be heavily emission-dependent, with each unit of GDP associated with relatively high levels of CO_2 emissions-posing risks to green growth objectives and to the country's ability to meet increasingly stringent global carbon standards. Viet Nam therefore faces a dual risk: vulnerability to fossil-fuel price volatility and growing exposure to international climate-trade measures such as the EU Carbon Border Adjustment Mechanism (CBAM).

International and domestic analysis converges on the scale of investment required. Estimates suggest that achieving net-zero by 2050 and ensuring climate resilience could require additional investment of 6.8 per cent of GDP per year, amounting to hundreds of billions of US dollars by 2040. For the energy sector alone, various scenarios indicate the need for annual investments in the order of USD 8-10 billion for renewables, grids and storage; other assessments place total power-sector investment needs even higher when transmission and distribution are fully accounted for. The adjusted Power Development Plan VIII (Decision No 768/QD-TTg of the Prime Minister) estimated that the 2026 - 2030 period total investment capital for developing power sources and transmission grids would be equivalent to 136.3 billion USD (of which investment for power sources would be about 118.2 billion USD, transmission grid would be about 18.1 billion USD), with varied sources of capital from state budget, private, public-private partnership, international support commitments (e.g. JETP, AZEC, ...), green credit sources, climate credit, green bonds...

Within this challenging landscape, several strategic opportunities stand out:

- **Access to concessional and catalytic climate finance**: JETP, multilateral climate funds (Green Climate Fund - GCF, Global Environment Facility - GEF, Climate Investment Fund - CIF), and climate-aligned facilities from the ADB, World Bank and bilateral partners are now explicitly oriented towards countries that can provide bankable, high-integrity project pipelines and demonstrate strong public-finance governance. For Viet Nam, this is both a financing opportunity and an incentive to accelerate reforms in green public financial management (green budgeting, climate-risk screening of public investment, carbon-pricing instruments).

[1] According to data from TheGlobalEconomy.com

- **Nascent domestic carbon market**: Vietnam has published a roadmap for a domestic carbon market, with a pilot phase to 2028 and full operation thereafter. In addition, Viet Nam's significant forestry and land-use potential can create a sizeable pipeline of high-quality carbon credits. If properly governed, this can complement tax revenues, de-risk green investments and support a just transition in regions dependent on carbon-intensive activities.

- **Global production reconfiguration and "China+1" strategies**: The tightening of ESG and climate standards in major export markets is prompting multinational enterprises to diversify their supply chains. With the right policy signals and incentives, Viet Nam can attract high-value investment in low-carbon manufacturing, batteries and EV components, and circular-economy industries such as advanced recycling and waste-to-resources.

- **Emerging green-finance and green-services markets**: Domestic banks, including large state-owned institutions such as Agribank and VietinBank, have begun integrating ESG criteria into lending, scaling up green credit, and experimenting with green deposits and sustainable-finance frameworks. The State Securities Commission (SSC) has issued guidance on green bonds, sustainable-business indices and ESG disclosure. These developments can underpin a broader ecosystem of green financial products, credit-rating services, and climate-risk analytics, positioning Viet Nam as a regional hub for green services if properly nurtured.

2. Systemic Gaps and Structural Constraints

Notwithstanding this progress, the report identifies several structural gaps which, if unresolved, could prevent Viet Nam from realising its green-transition ambitions in the 2026-2030 period.

2.1 Institutional and legal fragmentation

Strategic documents on green growth, climate change, energy, transport, agriculture and industry have largely been developed in parallel, with limited cross-referencing and operational integration. In practice, targets set out in green-growth and climate strategies are not consistently incorporated into PDP8 revisions, provincial socio-economic plans, industrial strategies or public-investment programmes.

In parallel, the investment-approval regime has often been complex, especially for large energy and infrastructure projects. The ongoing revision of the Investment Law is therefore a crucial opportunity not only to simplify procedures and strengthen decentralisation, but also to embed climate and green-transition objectives into the criteria for investment approval and incentives, for example by explicitly privileging low-carbon, high-technology, and high-value-added projects that meet clear environmental and social standards.

2.2 Incomplete green-finance architecture

The adoption of the national green taxonomy under Decision 21/2025/QD-TTg is a major step forward. It defines criteria for classifying environmentally sustainable activities and provides a basis for credit allocation, green bonds and climate-aligned public investment. Yet important elements remain underdeveloped:

- Technical screening criteria and "do no significant harm" (DNSH) safeguards need to be fully elaborated and translated into actionable guidance for banks, enterprises and investors.
- MRV (measurement, reporting and verification) arrangements are still incomplete, particularly for new instruments such as green bonds, transition finance and carbon-credit projects.
- Mutual recognition with regional and international taxonomies (for example ASEAN and EU frameworks) has not yet been formalised, which may increase transaction costs and uncertainty for foreign investors.

In practice, the green-finance market remains modest in scale. Green credit is growing quickly from a low base, with some large state-owned banks now holding green portfolios in the tens of trillions of dong, but overall volumes are still small relative to total credit. Green-bond issuance has been limited, and there is as yet no large national green guarantee fund, transition-bond framework or first-loss facility to crowd in private capital at scale.

The draft Decree on domestic carbon trading exchange, with trading expected to take place on Hanoi Stock Exchange (HNX) will be another cornerstone of the green-finance ecosystem. However, questions remain around credit quality, ownership rights, registry design, and the integration of the carbon market with the broader fiscal and financial system. In addition to social considerations-such as the potential use of carbon revenues to support vulnerable households and regions-there is a need to ensure that carbon proceeds are also directed toward environmental objectives, including emissions reduction, energy-transition investment, and climate-resilience measures. This highlights the importance of developing a coherent green budgeting framework to guide the allocation, tracking, and reporting of carbon revenues in line with national climate and environmental priorities.

2.3 Technology, data and human-capital constraints

Viet Nam's position in the global technology ladder remains relatively low. Energy intensity is significantly above the global average, and many industrial sectors operate with outdated equipment and practices. Around 80 per cent of renewable-energy equipment is imported, and domestic capacity to produce high-value components (such as advanced storage systems, hydrogen electrolysers or high-efficiency turbines) is still limited.

Data constraints are equally serious. Sectoral emissions and energy-use databases are fragmented, often incompatible, and not systematically interoperable. The 2022 NDC already noted the absence of integrated datasets for water resources, climate impacts and sectoral

emissions. Without robust and integrated data systems, it is difficult to design effective policies, track progress or comply with international reporting obligations.

Human-capital bottlenecks compound these challenges. The pool of professionals with expertise in renewable-energy engineering, climate-risk assessment, green finance, carbon accounting and circular-economy management remains thin and concentrated in major urban centres or donor-supported projects. Training systems, from vocational education to universities, have not yet fully adapted to the skills demanded by a green and digital economy.

2.4 Trade-related climate risks and market access

From 2026, exports of high-emissions products such as steel, cement, fertilisers and aluminium will face increasing scrutiny under CBAM and equivalent mechanisms. By 2030, CBAM's scope is expected to extend to all product groups covered by the EU ETS and to products with a risk of carbon leakage, including crude petroleum and petroleum products, inorganic basic chemicals, synthetic rubber, non-ferrous metals. Other countries are considering implementing a carbon border adjustment mechanism similar to CBAM such as the UK (expected full implementation from 2027), the US and Canada.

Looking ahead, several forward-looking scenarios need to be considered. **First**, the EU may expand CBAM beyond industrial goods to cover agricultural products, textiles, or downstream manufactured goods as climate ambition increases toward 2040 and 2050. **Second**, the level of CBAM obligations may rise if the EU accelerates its ETS decarbonisation trajectory, resulting in higher carbon prices being applied to imports. **Third**, the emergence of "CBAM-equivalent" mechanisms in other markets could create multiple compliance regimes, each with different measurement, reporting and verification (MRV) requirements, increasing transaction costs for exporters. These scenarios suggest that Vietnamese firms will not only face more stringent carbon accounting requirements, but also a more complex and fragmented trade environment.

Many Vietnamese producers still lack the capacity to measure, report and verify their Scope 1-3 emissions, and there is limited availability of domestic accredited verifiers. Without swift improvements in corporate reporting, product-level carbon accounting and production-process upgrading, Viet Nam risks losing market share in key export markets.

3. The Role of Economic and Financial Policy

The green transition will not succeed through sectoral or technical interventions alone. It requires a profound re-orientation of the economic and financial system. The Ministry of Finance assumes a pivotal role: stewarding macroeconomic stability, managing public finances, guiding national planning, regulating public investment and FDI, overseeing SOEs, and shaping the legal and institutional framework for financial markets.

This expanded mandate places the Ministry at the centre of Viet Nam's transition to a green, digital and climate-resilient growth model. The implications are profound:

- **Fiscal policy and green budgeting**: Budget allocations, public-investment decisions, tax regimes and subsidy structures must be realigned with Viet Nam's climate and environmental priorities. This includes phasing out environmentally harmful subsidies where feasible, establishing predictable carbon-pricing mechanisms, and integrating climate-risk, resilience and green-transition criteria into the appraisal and prioritisation of all public-investment projects. Fiscal policy must shift from revenue extraction to behaviour-shaping, rewarding low-emission, resource-efficient and innovative economic activity. This also requires a green VAT schedule, accelerated depreciation for green technologies, and the integration of climate screens into all public-investment and procurement decisions.

- **Debt management and climate-aligned borrowing**: Green transition infrastructure will increase financing needs. Public debt and contingent liabilities must therefore be managed prudently, with climate-related investments anchored in a credible medium-term fiscal framework. A diversified borrowing strategy, including sovereign green bonds, sustainability-linked bonds, climate-related development-policy operations, and debt-for-climate or debt-for-nature swaps, can lower financing costs while signalling long-term policy clarity to markets. Climate-fiscal risk assessments should become mandatory in debt-management strategies, reflecting exposure to disasters, stranded-asset risks and climate-transition liabilities.

- **Financial-sector regulation and supervision**: Through its authority over capital-market regulation, taxation of financial instruments and coordination with the State Bank and supervisory agencies, the Ministry can accelerate the uptake of green-finance standards. This includes implementing mandatory sustainability disclosure, developing prudential incentives for green lending, establishing a supervisory technology (SupTech) regime for ESG compliance, and setting the regulatory foundations for green, transition and sustainability-linked instruments.

- **State-owned enterprise (SOE) reform and public-investment governance**: SOEs remain dominant in energy, transport, heavy industry and public-infrastructure development. The Ministry's role in approving investment plans, debt issuance and corporate-governance frameworks is essential to aligning SOE operations with national net-zero pathways and modern ESG standards.

- **National planning, FDI strategy, and industrial policy**: The Ministry must ensure that major national and sectoral plans, including energy, industry, logistics, digital transformation, land-use and regional development, are aligned with green-transition objectives. FDI policy must shift from quantity to quality, prioritising low-carbon, technology-intensive, high-value projects with strong local-content and technology-transfer commitments. Green screening criteria should be integrated into investment approvals, and fiscal incentives should reward low-carbon processes, high local value added, modern ESG standards and participation in green export value chains.

- **Trade competitiveness and green export strategy:** The transition has major implications for trade. Viet Nam must prepare for CBAM, supply-chain carbon disclosure, sustainable-origin requirements and global green-product standards. MoF should lead on a national CBAM-response strategy, green-customs reforms, export-sector support for data and MRV upgrades, and fiscal incentives for low-carbon export manufacturing.

This report therefore provides the Ministry with an integrated view of how the green transition intersects macro-fiscal stability, financial-sector development, public-investment governance, industrial upgrading, FDI attraction and long-term growth dynamics. It identifies a package of priority reforms for the 2026-2030 period, grounded in international experience and Viet Nam's evolving policy context.

4. Strategic Directions and Priority Reforms for 2026-2030

To accelerate Viet Nam's green transition during 2026-2030, this report proposes five priority reform areas. First, Viet Nam should establish a high-level governance mechanism—such as a Prime Minister-led National Green Transition Council—to resolve cross-sector coordination bottlenecks, align planning systems, and anchor medium-term transition targets. Second, the revision of the Investment Law should be used to embed green-transition criteria into investment selection and fiscal incentives, ensuring that priority projects receive predictable, long-term policy signals. Third, the Ministry of Finance, working with line ministries, should complete and operationalise the national green-finance architecture, including the green taxonomy, sustainable-finance standards and catalytic financing instruments. Fourth, Viet Nam needs to build a credible carbon-pricing and carbon-market regime, with transparent MRV systems, clear allocation and auctioning rules, and ring-fencing of carbon revenues for strategic programmes such as 500 kV grid upgrades, just-transition support and clean-technology R&D. Finally, the government should invest in modern data systems, green-technology innovation, and human-capital development to equip the economy for a low-carbon future. These reforms form an integrated package designed to strengthen macro-planning, crowd in private capital and enhance Viet Nam's resilience and competitiveness in a rapidly changing global landscape.

4.1 Establish a high-level governance mechanism for the green transition

To overcome fragmentation and ensure coherence across planning, fiscal, regulatory and industrial strategies, Viet Nam should establish a Prime Minister-led National Green Transition Council, supported by a technical secretariat with independent analytical capacity.

The Ministry of Finance should act as a principal vice-chair, ensuring that macroeconomic, fiscal, financial-stability and public-investment considerations are embedded in transition planning. Key functions include:

- setting legally anchored medium-term transition targets;
- resolving cross-sector conflicts (energy vs. land, industry vs. environment);

- coordinating climate-finance mobilisation;
- ensure alignment of all regional, sectoral, and provincial master plans with national climate objectives;
- screen all major public-investment projects for climate alignment before approval; and
- monitoring whole-of-government implementation.

International analogues include the UK's Climate Change Committee, Korea's Presidential Committee on Carbon Neutrality and France's High Council on Climate.

4.2 Integrate green objectives into the Investment Law and fiscal-incentive framework

The ongoing revision of the Investment Law and its guiding decrees offers a critical opportunity to embed green-transition criteria into Viet Nam's investment regime. The Ministry should use the reform window to:

- Prioritise investment projects that advance strategic green-transition goals. This includes projects that demonstrate low carbon intensity (e.g., ≤ 50% of the sectoral average), high local value added (e.g., ≥ 40% by year five), verifiable technology-transfer and R&D commitments, alignment with Viet Nam's green taxonomy and Do No Significant Harm criteria, and mandatory transition plans for large emitters before project approval.
- Link tax and land-use incentives to measurable performance in emissions reduction, resource efficiency and local content. Incentives should be conditional on MRV-verified emissions reduction, resource efficiency, circular-economy adoption and domestic supply-chain integration.
- Clarify long-term, predictable incentive regimes for renewables, grids and storage. International experience shows that predictable multi-year regimes, such as Contracts for Difference (UK) or long-term auction programmes (Chile), dramatically reduce financing costs. In Viet Nam, the design of such regimes typically falls under the mandate of line ministries, particularly the Ministry of Industry and Trade (MOIT), while the Ministry of Finance (MOF) reviews fiscal implications, pricing structures and potential contingent liabilities before final approval. Strengthening Viet Nam's auction design and PPA frameworks therefore requires clearer inter-ministerial coordination and a well-defined division of responsibilities.
- Strengthen the coherence of national macro-planning by ensuring that provincial Socio-Economic Development Plans, sector-specific development plans, and regional master plans are fully aligned with Viet Nam's climate-transition pathways and long-term green-industrial development priorities.

MoF's leadership is vital in designing incentive schemes that are fiscally sustainable, transparent and compatible with international commitments.

4.3 Complete and operationalise the green-finance architecture

The Ministry of Finance is one of the key actors in orchestrating Viet Nam's green-finance ecosystem, working alongside line ministries and regulatory agencies to shape the overall policy, fiscal and market architecture. Priority actions for the period 2026-2030 include:

- Fully operationalise the national green taxonomy issued by the Prime Minister under the Decision 21/2025/QD-TTg. This requires MOF in coordination with MAE and SBV to issue detailed technical screening criteria, DNSH safeguards, mandatory application guidelines for financial institutions, SOEs and private enterprises, mandatory reporting templates integrated with MoF's green-budgeting system, and harmonisation with ASEAN, EU and ICMA standards.

- Develop a coherent framework for green, social, sustainability and sustainability-linked bonds, including tax treatment, disclosure requirements and verification standards, and sovereign green bond issuance to create a benchmark yield curve for ASEAN markets.

- Establish catalytic instruments such as a Viet Nam Green Investment Facility, a national green-credit guarantee scheme for SMEs and renewable energy developers, transition-finance windows for hard-to-abate sectors, and a Green Infrastructure Viability Gap Fund for PPPs.

- Phase in International Sustainability Standards Board-aligned climate and sustainability disclosure for listed companies, major SOEs and financial institutions, starting with the largest entities.

These reforms will deepen capital markets, reduce borrowing costs and position Viet Nam to leverage international climate-finance flows more effectively.

4.4 Build a robust carbon-pricing and carbon-market regime

The pilot carbon market should be launched on a sound legal and technical footing, with a transparent, digital registry and MRV system, clear allocation and auctioning rules for emissions allowances, provisions for linking with international markets where appropriate, and mechanisms to channel carbon revenues into just-transition measures and strategic green investments.

MoF's role will be central in establishing the carbon-trade exchange platform, integrating carbon-market revenues into the state budget, managing fiscal risks, and ring-fencing carbon proceeds for high-priority government programmes-such as 500 kV grid upgrades, strategic power-generation projects, just-transition measures, and research and development. The Ministry must also ensure that the carbon-market framework is coherent with other taxes, fees and regulatory charges across the fiscal system.

4.5 Invest in technology, data and human capital for the green economy

The report recommends:

- A national programme to modernise data infrastructure for energy, emissions, climate risks and green finance;
- A unified green-project database linked to the public-investment management system, with full interoperability across ministries and provinces;
- Targeted support for research, development and innovation in green technologies, including through tax incentives for R&D, public-private innovation funds, and the creation of specialised energy-innovation centres linked to universities and industry; and
- A comprehensive green-skills strategy spanning vocational training, higher education and continuous learning, with clear targets for training engineers, technicians, financial analysts and policymakers in green competencies.

5. Conclusion

Viet Nam's green transition is now the defining strategic challenge and opportunity of the 2026-2030 period. Decisions on fiscal policy, planning, financial regulation, public investment, SOE governance and FDI frameworks will determine whether the country can convert its net-zero commitments into a new model of green, competitive and resilient growth.

For the Ministry of Finance, the green transition is not an external constraint but a strategic agenda that intersects directly with macro-fiscal stability, sovereign creditworthiness, growth quality and resilience to shocks. By leading on green-fiscal reform, climate-aligned borrowing, green-finance ecosystem development and the integration of climate risks into economic decision-making, MoF can help ensure that Viet Nam's green transition strengthens, rather than weakens, the foundations of long-term prosperity.

This report is offered to the Ministry of Finance as a technical and strategic contribution to that endeavour: to help shape a coherent economic and financial vision for 2026-2030 in which the green transition is recognised not as a cost, but as Viet Nam's next engine of development.

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Glossary

Acronym	Full name
ADB	Asia Development Bank
AF	Adaptation Fund
AFD	Agence Française de Développement
AFDB	African Development Bank
AFOLU	Agriculture, Forestry and Other Land Use
AZEC	Asia Zero Emission Community
BAU	Business As Usual
CAGR	Compound Annual Growth Rate
CAT	Climate Action Tracker
CBAM	Carbon Border Adjustment Mechanism
CBI	Climate Bonds Initiative
CBRC	China Banking Regulatory Commission
CCAC	Climate and Clean Air Coalition
CCC	Climate Change Committee
CCS	Carbon Capture and Storage
CCUS	Carbon Capture, Utilization, and Storage
CDM	Clean Development Mechanism
CERF	Carbon Emission Reduction Facility
CIF	Climate Investment Funds
COP26	26th Conference of the Parties
CPGTA	Coal Power Generating Transition Act
CPI	Climate Policy Initiative
CPM	Carbon Pricing Mechanisms
CPTPP	Comprehensive and Progressive Agreement for Trans-Pacific Partnership

Acronym	Full name
CSRD	Corporate Sustainability Reporting Directive
CTF	Clean Technology Fund
CTS	Cap and Trade Systems
DCCC	Decarbonization and Climate Change Committee
DEs	Developing Economies
DFIs	Development Finance Institutions
EC	European Commission
EEG	Erneuerbare-Energien-Gesetz (Renewable Energy Sources Act)
EEs	Emerging Economies
EMDEs	Emerging Market and Developing Economies
EPE	Environment Performance Evaluation
EPR	Extended Producer Responsibility
ERK	Emission Reduction Kredit
ESG	Environmental, Social, and Governance
ETM	Energy Transition Mechanism
ETS	Emission Trading Schemes
EU	European Union
EVFTA	EU-Vietnam Free Trade Agreement
EVN	Vietnam Electricity
EWS	Early Warning Systems
FfD4	Fourth International Conference on Financing for Development
FPIC	Free, Prior and Informed Consent
FRLD	Fund for Responding to Loss and Damage
GBP	Green Bond Principles
GCF	Green Climate Fund
GCGF	Green Credit Guarantee Facility
GDF	Green Development Fund

Acronym	Full name
GEF	Global Environment Facility
GGGI	Global Green Growth Institute
GGI	Green Government Initiative
GHG	Greenhouse Gas
GIZ	German Agency for International Cooperation
Green-IA	Green Impact Assessment
GRI	Global Reporting Initiative
GSCI	Global Sustainable Competitiveness Index
GSIA	Global Sustainable Investment Alliance
GSS+	Green, Social, Sustainability, and Sustainability-Linked (GSS+) Instruments
GX	Green Transformation
HCC	High-Carbon Content
IBC	Investment Banking Commission
ICMA	International Capital Market Association
IEA	International Energy Agency
IFRS	International Financial Reporting Standards
ILS	Insurance-linked Securities
IMF	International Monetary Fund
IPM	Integrated Pest Management
IREA	International Renewable Energy Agency
ISSB	International Sustainability Standards Board
JBIC	Japan Bank for International Cooperation
JCM	Joint Crediting Mechanism
JET	Just Energy Transition
JET-IP	Just Energy Transition Partnership - Investment Plan
JETP	Just Energy Transition Partnership
JICA	Japan International Cooperation Agency

Acronym	Full name
JTF	Just Transition Fund
KPI	Key Performance Indicator
KTF	Climate and Transition Fund
LDC	Least Developed Countries
LULUCF	Land Use, Land-Use Change, and Forestry
MDBs	multilateral development banks
MRV	Monitoring, Reporting, Verification
MTEF	Medium Term Expenditure Framework
NDCs	Nationally Determined Contributions
NDRC	National Development and Reform Commission
NGFS	Network for Greening the Financial System
NRL	Nature Restoration Law
NRRP	National Recovery and Resilience Plan
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OETS	Ocean Economic and Trade Strategy
PARCA	Partnership for Carbon Accounting Financials
PCGG	Program Committee and Green Growth
PCI	Provincial Competitiveness Index
PDP8	Power Development Plan VIII
PES	Payment for Ecosystem Services
PGI	Provincial Green Index
PPA	Power Purchase Agreement
PPC	Power Planning and Coordination
PPP	Public-Private Partnership
RCA	Revealed Comparative Advantage
RCEP	Regional Comprehensive Economic Partnership

Acronym	Full name
REDD+	Reducing Emissions from Deforestation and Forest Degradation
RegTech	Regulatory Technology
RIA	Regulatory Impact Assessment
SCF	Social Climate Fund
SDGs	Sustainable Development Goals
SECO	State Secretariat for Economic Affairs
SEEE	Shanghai Environment and Energy Exchange
SFDR	Sustainable Finance Disclosure Regulation
SIDs	Small Island Developing States
SLB	Sustainability-Linked Bond
SPO	Second Party Opinion
SupTech	Supervisory Technology
TCFD	Task Force on Climate-related Financial Disclosures
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WB	World Bank
WTO	World Trade Organization

Foreword

1.1 Global Context

Against the backdrop of intensifying climate risks and accelerating depletion of natural resources, the global green transition has become a defining strategic direction and an unavoidable pathway for sustainable socio-economic development. This transition extends beyond reducing greenhouse-gas emissions, expanding renewable energy and improving resource efficiency. It involves an integrated approach that aligns economic and fiscal policy, technological innovation and environmental governance with the aims of building greener and more resilient economies. According to UNDP (2024) and the IEA (2023), the green transition is now a central pillar of global growth, directly shaping national competitiveness and socio-economic resilience. The World Bank (2024) warns that countries that delay this transition risk heightened exposure to natural disasters, resource losses and reduced access to global supply chains and international finance. Leading economies such as the European Union, the United States, Japan, the Republic of Korea and China are advancing their respective Net Zero strategies through major programmes including the European Green Deal, the Just Energy Transition Partnership and the Inflation Reduction Act. These initiatives are reshaping growth models and directing patterns of production and consumption towards low-emission pathways.

New economic policy frameworks have also emerged, among which the EU Carbon Border Adjustment Mechanism (CBAM), ESG investment standards and green financial instruments such as green bonds, carbon credits and green budgeting stand out. The IMF (April 2025) highlights the increasingly central role of green fiscal policy and carbon pricing within macroeconomic frameworks and national emission-reduction strategies. Similarly, UNDP (2025) emphasises that climate finance is indispensable for achieving the Sustainable Development Goals (SDGs).

The OECD (2025) estimates that the annual global financing needs for climate mitigation amount to roughly USD 5 trillion up to 2030, whereas actual capital flows in 2024 totalled just under USD 2 trillion, barely one third of what is required. This financing gap not only illustrates the scale of the climate-finance challenge but also underscores the need to reshape global capital mobilisation. Stronger coordination by multilateral development banks (MDBs), expansion of public-private partnerships (PPPs) and more intensive use of blended finance are essential to bridge this gap. These approaches constitute a new institutional foundation for the green transition, distributing risks more effectively, directing private capital and scaling up investments in low-carbon technologies in developing economies.

More broadly, the world is moving towards a new development paradigm in which progress in the green transition increasingly influences competitiveness, creditworthiness and access to international capital. It is reconfiguring the global landscape of trade and investment. For this reason, the green transition has shifted from a strategic choice to an imperative for

sustaining growth, maintaining competitiveness and avoiding marginalisation in the emerging global economy. Countries, particularly developing ones, must therefore anticipate these dynamics, seize new opportunities and strengthen institutional and policy frameworks that support a green-development trajectory.

1.2 National Context

Vietnam enters this new phase of development facing both significant opportunities and considerable challenges as it strives to transition towards a greener economic model. In the first nine months of 2025, Vietnam's GDP grew by an estimated 7.85% year-on-year[2], the second-highest nine-month increase since 2011, highlighting resilient growth despite global headwinds and reaffirming the country's deepening global integration and strong participation in global supply chains. The breakdown of growth shows strong performance across sectors: industrial and construction output rose about 8.69%, services grew 8.49%, while agriculture-forestry-fishery increased by 3.83%. This broad-based growth—across industry, services, and agriculture-provides a diversified economic foundation that enhances resilience as Vietnam pursues structural transition toward sustainability.

Moreover, rising foreign direct investment (FDI), robust domestic demand and strong infrastructure investment provide additional tailwinds for green-growth projects. Specifically, in the first nine months of 2025, Vietnam attracted USD 28.54 billion in registered FDI capital (up 15.2% year-on-year) and realised USD 18.80 billion in FDI disbursement (up 8.5% YoY) - the highest level for a nine-month period in the last five years. Concurrently, total social investment (public + private + FDI) reached VND 2,701.8 trillion, up 11.6% compared to the same period in 2024. Robust export growth (348.7 billion USD in goods exports over nine months, +16.0% YoY) further supports strong domestic demand and external demand for green-oriented goods. This favourable macro-economic context enhances the capacity of Vietnam to mobilise capital and absorb upfront costs required for the green transition.

Combined with Vietnam's youthful labour force, favorable geography, and abundant renewable energy potential, these recent macroeconomic results strengthen the argument that the country is well-positioned to embark on a low-carbon, sustainable growth trajectory.

Yet Vietnam continues to confront notable constraints. The national power system remains heavily dependent on fossil fuels - fossil-fuel generation accounts for around 53.9% of total electricity capacity, including 47.7% from coal-fired plants and 6.2% from gas-fired generation. This fossil-heavy energy mix not only locks in high carbon emissions, but also undermines the reliability, affordability and sustainability of electricity supply. Such structural dependence on fossil fuels risks raising production costs in energy-intensive industries, increasing supply-chain disruption, limiting access to clean energy for households and businesses, and ultimately constraining socio-economic development, job creation and the green transition.

[2] Vietnam's GDP growth for the first 9 months of 2025 is 7.85%, GDP growth of 2025 is planned in range of 8.3-8.5%, GDP growth of 2026 is targeted at least 10%. GDP growth of the 2026-20230 is expected 2 digits number.

Vietnam is also among the countries most vulnerable to climate impacts. Since the beginning of 2025, natural disasters and climate changes have caused damage of over 85 trillion VND, of which storms and floods in the Central provinces in the fourth quarter caused damage of about 14 trillion VND. The World Bank (2024) estimates economic losses from climate change in Vietnam at approximately 3.2% of GDP in 2020, with potential losses rising to 12.5% of GDP by 2050 without timely adaptation and mitigation measures. These risks place considerable strain on infrastructure, public finances, livelihoods and energy security. At the same time, access to green finance and clean technologies remains limited, and frameworks governing the green economy and ESG standards are still evolving, with uneven progress across sectors.

Recognising the significance of the green transition, the Government of Vietnam has demonstrated strong commitment through its Net Zero pledge for 2050 and the updated NDCs (2022). Building on these commitments, the Government has gradually developed a comprehensive strategic and legal framework for green growth and climate action. This includes the National Green Growth Strategy 2021-2030, with Vision to 2050 (Decision 1658/QĐ-TTg); the National Climate Change Strategy to 2050 (Decision 896/QĐ-TTg); the Circular Economy Development Scheme (Decision 687/QĐ-TTg, 2022); the National Environmental Protection Strategy to 2030, with Vision to 2050 (Decision 450/QĐ-TTg, 2022); the 2020 Law on Environmental Protection; and the National Power Development Plan VIII.

Vietnam is also implementing the Just Energy Transition Partnership (JETP) and enhancing cooperation with the Green Climate Fund (GCF), the Global Environment Facility (GEF), the Climate Investment Funds (CIF) and international initiatives such as Financing for Development (FfD4). These efforts aim to mobilise large-scale climate finance to support the 2050 Net Zero pathway. The World Bank (2024) estimates that Vietnam will require approximately USD 368 billion in green investments by 2040, equivalent to 6.8% of GDP annually. This underscores both the magnitude of the challenge and the need for a robust, effective institutional framework for green finance.

In this context, positioning Vietnam within the global green-transition landscape is more than a strategic consideration. It is essential for ensuring sustainable growth, reinforcing national competitiveness and strengthening Vietnam's standing within regional and global green-growth networks.

1.3 Objectives and Significance of the Report

This report sets out priority policy recommendations to support Viet Nam's green transition during the 2026-2030 period. It will be circulated for public consultation at the Vietnam Economy and Finance Forum 2025, organised by the Ministry of Finance under the theme "Shaping Viet Nam in the New Context: Strategic Vision of the Economy and Finance for the 2026-2030 Period." Building on the country's strengthened commitments under the updated NDC, the outcomes of COP30, and emerging global standards in climate finance and green industrial policy, the report argues that the green transition must be understood not as an isolated environmental initiative but as the organising framework for Viet Nam's next stage of economic modernisation, competitiveness and sustainable development.

The Ministry of Finance holds a comprehensive mandate across national planning, fiscal policy, public investment, FDI strategy and financial-sector development. This gives the Ministry a decisive role in steering the green transition through core policy levers that include fiscal and tax reform, green budgeting, investment appraisal, carbon-pricing development, financial-market regulation and SOE governance.

The report has four key objectives:

- To assess Viet Nam's position within the accelerating global green transition, including shifts in climate finance, supply-chain reconfiguration, trade standards and carbon-pricing regimes.
- To evaluate the institutional, economic and financial capacities required to deliver green development, low-emission growth and climate resilience.
- To identify policy gaps and structural constraints that may hinder Viet Nam's ability to meet its international commitments on emissions reduction, green finance and sustainable development.
- To propose strategic directions and priority reforms to strengthen the governance framework, legal system, financial instruments, economic-planning tools and international partnerships needed to position Viet Nam as a competitive, resilient and responsible leader in green growth in the region and beyond.

1.4 Research Methods and Data Sources

The report adopts a multi-method approach to ensure comprehensive, objective and up-to-date analysis:

- ***Synthesis and analysis of secondary materials:*** Official documents and reports from key Vietnamese ministries (Finance, Industry and Trade, Transport, Agriculture and Environment), together with publications by the World Bank, UNDP, IEA, OECD, IMF and other reputable international institutions. These provide insights into global trends, energy structures, green-investment flows, the economic impacts of climate change and Net Zero scenarios for Vietnam.

- ***Comparative policy analysis:*** Review and comparison of international experiences in green-finance mechanisms, carbon-pricing instruments, green fiscal policies and energy-market models. These comparisons help identify policy gaps and inform recommendations suited to Vietnam's institutional capacities.

All data are drawn from authoritative secondary sources compiled from national regulatory bodies and reputable international organisations. Figures, references and citations are cross-checked across multiple sources to ensure accuracy, consistency and alignment with official Vietnamese and international datasets.

1. Global Trends in Green Transformation

1.1 Green Transformation

Green transformation constitutes a comprehensive shift from an economy reliant on fossil fuels to a sustainable system emphasising clean energy, efficient resource utilisation, and minimised environmental impact. Far from being merely a technical adjustment, it represents a profound societal transition necessitating the involvement of governments, businesses, and communities to combat global climate change while generating new economic opportunities, such as green jobs and sustainable growth. As of November 2025, the number of countries announcing or considering net-zero targets has risen to 148, reflecting heightened urgency amid escalating climate impacts like record-breaking heatwaves and extreme weather events in 2024-2025[3].

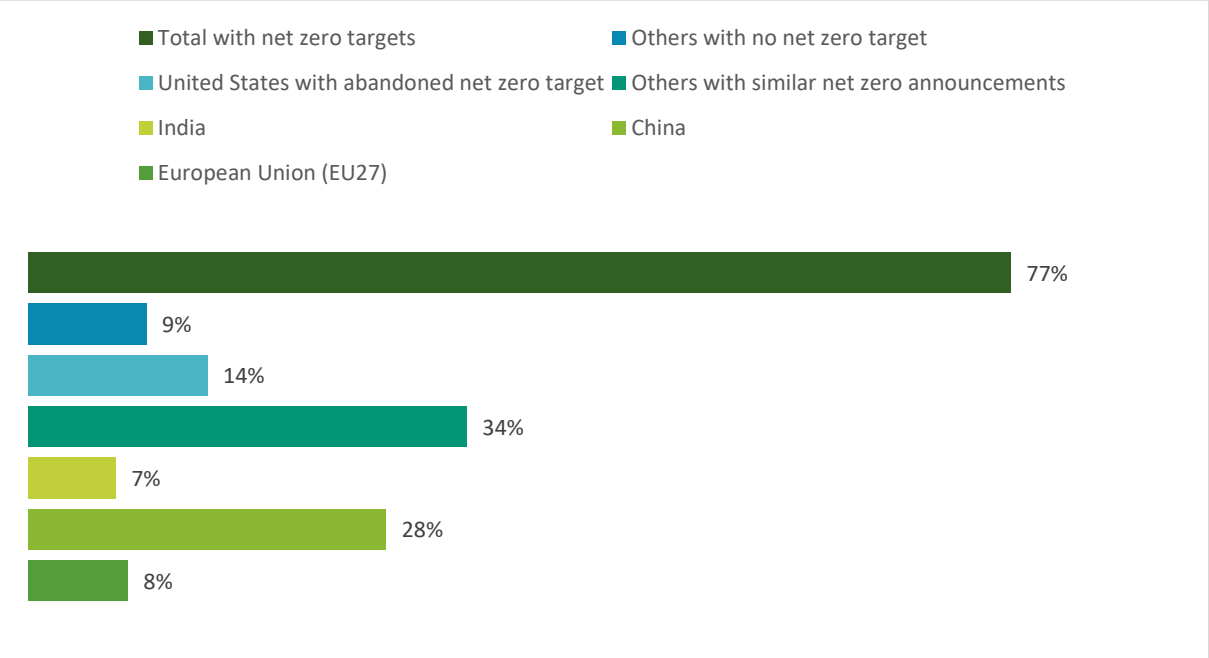


Figure 1: Total emissions share (5)

For major economies: (i) the European Union is committed to becoming the world's first carbon-neutral continent by 2050; (ii) China aims to peak emissions before 2030 and achieve net zero by 2060; (iii) the United States has pledged net zero by 2050, though policy continuity depends on successive administrations; (iv) pioneering nations including the United Kingdom, France, Japan, and New Zealand have enacted specific targets and policies for net zero by 2050. A Green Economy Coalition survey (2024) reveals that 71 per cent of the global population accepts prioritising environmental protection even if it moderates economic growth rates.

Approaches to green transformation divide into two principal categories, fundamentally shaping policy design. In the narrow sense, it aligns with green growth (Berger, 2011), prioritising economic and technical dimensions: efficient resource use, emission reductions, and clean technology innovation to sustain growth while curbing environmental harm. Conversely, the broader perspective frames it as a holistic socio-economic shift towards

[3] Copyright © 2025 by Climate Analytics and NewClimate Institute

sustainable development (Gu et al., 2018; Cheba et al., 2022), extending beyond environmental and economic goals to encompass social equity, job transitions, and climate adaptation.

Contemporary international trends favour this comprehensive approach, linking transformation to inequality reduction, job protection, and welfare enhancement. Policies address climate change, environmental degradation, and biodiversity loss while ensuring a just transition that leaves no one behind, mitigating social inequities. The European Union defines green transformation as integrating economic growth with environmental protection to secure high living standards for current and future generations through efficient resource use. From an investment standpoint, Demirag (2023) describes it as adopting sustainable practices to safeguard the environment, counter climate change, and improve human health, incorporating renewable energy and circular economy principles. Notably, institutions such as the European Training Foundation (ETF, 2022) and the OECD (2025) extend the concept to a broader development paradigm-one that emphasises a shift toward a low-carbon, resource-efficient and socially inclusive economic model, where environmental sustainability and social equity are embedded as core drivers of long-term growth.

The scope of green transformation decisively influences policy breadth and priority. A narrow definition confines policies to market instruments, technology investments, and direct emission cuts in production sectors. Adopting the broader, holistic definition (as per OECD and ETF) requires multifaceted, cross-sectoral policy packages transcending environmental silos, demanding inter-ministerial governance and intergenerational equity (OECD, 2025). Integrating green economic policies into national strategies is paramount (IBC, 2022). These must incorporate social supports, including retraining for workers displaced by fossil fuel phase-outs, robust social safety nets, and equitable access to clean energy. This inclusive approach pursues net-zero emissions alongside sustainable economic growth and biodiversity preservation, ensuring equitable benefits for all citizens.

Global trends reveal growing climate commitments yet insufficient concrete action, policy expansion slowdowns, and widening gaps between strategy and implementation. An OECD assessment (2024) indicates that national climate policies fall short of 2030 emission reduction targets. Data from the OECD International Programme on the Action of Climate (IPAC), covering over 80 per cent of global emissions, shows current nationally determined contributions (NDCs) achieving only a 14 per cent cut from 2022 levels, whereas limiting warming to below 1.5°C requires at least 43 per cent by 2030. While many nations have set net-zero goals, transforming these into binding legal frameworks remains limited: as of 2024, only 27 countries plus the EU, representing 16 per cent of global emissions, have enacted enforceable climate laws. This institutional fragmentation hampers effective policy execution across economies.

The OECD employs the Climate Actions and Policies Measurement Framework (CAPMF) to evaluate policy scope and stringency in member states. Findings indicate a marked deceleration: national climate policy coverage grew by just 1 per cent in 2022 and 2 per cent in 2023, far below the 10 per cent annual average from 2010-2021. This deceleration signals

waning policy momentum amid mounting pressures for 2030 targets. The OECD warns that persistence risks closing the window for 1.5°C compatibility, escalating long-term socio-economic costs and eroding investor, private sector, and public confidence in governmental green transition capabilities.

Climate mitigation policies encompass all measures, technologies, and socio-economic instruments to reduce or eliminate greenhouse gas emissions. The Climate Policy Initiative (CPI, 2025) reports that 70 per cent of global climate finance targets mitigation, focusing on energy, transport, industry, and land use. Four primary mitigation methods prevail:

(1) **Energy transition:** Most OECD, EU, and G20 nations pursue carbon-neutral power sectors via renewable expansion, coal phase-outs, and energy efficiency. The EU's European Green Deal and Fit for 55 package target a 55 per cent emission cut by 2030. Germany and Denmark will eliminate coal by 2030, with renewables exceeding 70 per cent of electricity mixes. As of mid-2025, global renewable capacity additions hit a record 510 GW in 2024, led by solar and wind (IRENA, 2025). China, the largest emitter, advances its 2060 Energy Strategy emphasising wind, solar, and green hydrogen. Alongside clean energy scaling, efficiency gains in industry, buildings, and transport are central. OECD (2025) data show nations with transparent energy pricing and mandatory efficiency standards reduce emissions 30-40 per cent faster than those relying on voluntary incentives.

(2) **Carbon pricing and emissions trading reforms:** OECD (2025) identifies 73 operational carbon pricing mechanisms worldwide, including taxes and emissions trading systems (ETS). The EU ETS-the world's first and most established carbon market-covers more than 10,000 installations and regulates approximately 45 per cent of EU greenhouse-gas emissions. China's ETS, launched in 2021, is the world's largest by CO_2 volume. By the end of August, the cumulative trading volume of China's carbon emissions rights trading market was nearly 700 million tonnes, with a trading value of approximately 48 billion yuan (about 6.6 billion U.S. dollars) (SCIO, 2025). Canada introduced a national carbon tax in 2019, beginning at C$20/t$CO_2$, increasing to C$50/tCO_2 in 2022, and legislated to rise to C$170/t$CO_2$ by 2030, with revenues earmarked for emissions-reduction measures, household rebates and social programmes. These instruments create explicit price signals that incentivise firm-level emissions reductions, while generating predictable fiscal revenues to support climate funds and adaptation programmes.

Generali Group (2025) emphasises that robust corporate carbon-footprint accounting-integrated into investment selection and insurance-underwriting processes-is essential for accurate climate-risk pricing in financial markets and supports alignment with national decarbonisation pathways.

However, carbon-pricing instruments are only one component of a wider policy architecture. Their effectiveness depends on close coordination with energy planning, industrial strategy and financial regulation. In China, for example,

emissions reductions attributed to the ETS have begun to plateau in the power and industrial sectors, partly due to growing penetration of electric vehicles (EVs) and renewable energy, which is reshaping national energy demand patterns (OECD, 2025; SCIO, 2025). This demonstrates the need for carbon markets to evolve in concert with broader transition policies to maintain effective abatement incentives.

(3) **Technological innovation and industrial transformation:** Innovation drives medium- to long-term decarbonisation. CPI (2025) notes fastest-growing investments in low-emission technologies, including green hydrogen, energy storage, carbon capture, utilisation, and storage (CCUS), and climate-smart agriculture, comprising nearly 30 per cent of new mitigation finance from 2021-2023. The OECD recommends blending tax incentives, green credits, and public R&D with product emission standards to accelerate clean technology commercialisation. Japan's Green Innovation Fund allocates ¥2 trillion (2020-2030); the US Inflation Reduction Act (2022) provides approximately $369B for energy security and climate change programs, primarily through tax credits, grants, and loans, focusing on clean energy, electric vehicles, clean manufacturing, and deficit reduction.

(4) **Land-use management and ecosystem conservation:** Land-use change, agriculture, and forestry account for 20 per cent of global emissions. Policies emphasise REDD+, low-carbon agriculture, and wetland preservation. Brazil and Indonesia have curbed deforestation via payments for ecosystem services (PES). The EU's 2024 Nature Restoration Law targets restoring 20 per cent of degraded ecosystems by 2030. OECD findings indicate integrating land policies with carbon markets and community investments doubles emission reduction efficacy compared to siloed approaches.

Climate adaptation policies focus on minimising damages and building resilience. Yet CPI (2025) highlights that adaptation finance constitutes under 10 per cent of total climate funding, inadequate for vulnerable nations' needs. Three core adaptation methods integrate into national strategies:

(1) **Resilient infrastructure and sustainable urban planning:** Over 70 per cent of OECD members embed climate factors in infrastructure and urban planning (OECD, 2025). Measures include flood-resistant drainage, heat-resilient and energy-efficient buildings, and expanded urban green spaces. The Netherlands' Delta Programme shields lowlands from sea-level rise; France mandates "climate proofing" for all public investments since 2022; Singapore's "City-in-Nature" blends urban greening with flood defences.

(2) **Early Warning Systems and Disaster Risk Management**: Effective Early Warning Systems (EWS) slash disaster losses 30-50 per cent (OECD, 2025). Investments in climate data and risk insurance rise. Japan and South Korea deploy digital weather platforms for flood and storm forecasts; Bangladesh offers satellite-based crop loss insurance.

(3) **Strengthening the adaptive capacity of communities and ecosystems**: Supporting vulnerable communities-particularly women, the poor, and informal-sector workers-is a prerequisite for maintaining equity and social acceptability during adaptation. Governments must invest in climate education, green skills training, and adaptive welfare policies. At the same time, the conservation of natural ecosystems such as mangroves, coral reefs, and wetlands is widely recognised as the most cost-effective nature-based adaptation solution.

Countries are increasingly adopting emissions trading systems (cap-and-trade), carbon taxes, and tradable carbon credits not only to reduce emissions but also to generate new revenue streams. A flagship example is the REDD+ mechanism (Reducing Emissions from Deforestation and Forest Degradation), which enables developing countries to sell forest-carbon credits on international markets. Several nations have combined REDD+ with trade in non-timber forest products to boost income and incentivise conservation. Article 6 of the Paris Agreement establishes the foundation for regulated cross-border carbon-credit transactions, creating the basis for an emerging global carbon market. As of November 2025, following the operationalisation of the Article 6 rulebook at COP29 in Baku, several countries have signed their first bilateral cooperation arrangements under Article 6.2, and the initial crediting period under the new Article 6.4 mechanism has commenced. These developments signal increasing international readiness to use carbon markets as a tool for achieving Nationally Determined Contributions.

However, Article 6 remains a work in progress. A number of key technical rules and methodologies under Article 6.4 are still being developed by the Article 6.4 Supervisory Body, and early drafts have attracted criticism for relying on assumptions considered insufficiently robust. Term limits for the Supervisory Body will not be revisited until 2028, potentially delaying deeper reforms. For both Article 6.2 and 6.4 mechanisms, persistent concerns revolve around transparency, consistency in accounting approaches, and the risk of heterogeneous national standards undermining environmental integrity. These unresolved issues highlight that while Article 6 opens significant opportunities for Viet Nam to participate in international carbon markets, its effective implementation will depend on continued global rule-making and capacity building at the national level.

Consequently, countries must develop national carbon-finance ecosystems comprising robust legal frameworks, transparent exchanges, and credible Monitoring, Reporting and Verification (MRV) systems to ensure credits are genuine and used appropriately. When properly designed, carbon markets become not only environmental tools but powerful channels for mobilising green finance for enterprises. When properly designed, carbon markets can serve not only as environmental instruments but also as powerful channels for mobilising green finance for enterprises. However, their effectiveness depends on being embedded within a broader package of complementary policies. China's experience illustrates this clearly: while its national ETS has become the world's largest, its mitigation effect began to plateau in the power and industrial sectors because market incentives alone were insufficient. To reinforce the ETS, China has implemented a set of supporting measures-including mandatory energy-

efficiency standards for key industries, accelerated renewable-energy deployment targets, differentiated electricity pricing to discourage high-emission production, and fiscal incentives for electric-vehicle and storage uptake. These combined tools demonstrate that carbon markets deliver meaningful emission reductions only when aligned with energy planning, industrial upgrading and financial-sector policy.

1.2 Legalisation and Institutionalisation of Net-Zero Targets

In the global context, the legal foundation for climate action has been built and steadily reinforced around three main pillars: the United Nations Framework Convention on Climate Change, the Paris Agreement and countries' long-term low-emission development strategies. Under the Paris Agreement, parties commit to keeping the increase in global average temperature well below 2°C and to pursue efforts to limit it to 1.5°C above pre-industrial levels. To give effect to these goals, countries must prepare nationally determined contributions that set out their specific emission limitation targets. Parties are responsible for formulating, updating and implementing their NDCs, while also developing adaptation strategies tailored to their national circumstances, infrastructure, ecosystems and socio-economic capacities. This reflects a global shift in which climate action is no longer understood as emission reduction alone but also as adaptation and strengthening resilience to the impacts of climate change.

Countries and regions are moving from high-level pledges to legally binding net-zero commitments. Alongside international frameworks many governments have entered a phase of institutionalisation by adopting climate laws or high-level decrees that give legal force to net-zero emission targets and to stronger adaptation measures. Enshrining net-zero in law is intended to create binding obligations and enhance transparency in the implementation of climate actions. A number of frontrunners including Sweden, the United Kingdom, France, New Zealand, Denmark and Hungary have adopted legislation that clearly specifies the duty to reach net-zero emissions within a defined timeframe, typically by 2050. The EU Climate Law of 2021 is a prominent example, as it sets out the responsibilities of the European Commission and member states for planning, implementing and reporting emission reductions and requires adaptation to be integrated into infrastructure planning, energy systems and public finance. The United Kingdom's Sixth Carbon Budget (2033-2037) became the first to be fully aligned with a 1.5 °C trajectory following the Climate Change Committee's 2024 advice, and Germany advanced its legal target to net-zero by 2045 (previously 2050). At the same time many cities and municipalities across Northern Europe, North America and Asia are adopting local net-zero resolutions which help drive the green transition down to sub-national levels of governance. By 2025, 34 countries together with the European Union, accounting for around 85% of global emissions, had adopted or announced long-term climate strategies with quantitative targets. Most OECD and EU members are aiming for 2050, while major emerging economies such as China, India and Indonesia have set later targets in the 2060-2070 period that are more consistent with their development stage and capacities (CAT 2025).

These legal frameworks typically contain four core elements: a long-term objective, a medium-term pathway, monitoring and reporting mechanisms and clearly defined legal responsibilities. According to Generali (2025), national institutional and legal frameworks need to meet four main requirements to implement mitigation and adaptation strategies effectively. First, they must provide a clear legal basis that defines carbon neutrality objectives, timeframes, the lead authority and mechanisms for inter-sectoral coordination. Second, they must establish an independent monitoring, reporting and verification system to ensure transparency and accountability, including periodic reporting, risk assessment and policy updates based on scientific evidence. Third, they must integrate climate strategies into national development planning and public investment to avoid conflict between growth objectives and emission reduction goals. Fourth, they require a comprehensive climate finance framework that can mobilise public, private and international resources and maintain an appropriate balance between mitigation and adaptation. In practice, such frameworks typically include: (i) fiscal instruments such as carbon pricing, green taxes and targeted subsidies; (ii) green-bond and sustainable-finance regulations; (iii) public-finance mechanisms including dedicated climate funds, blended-finance facilities, guarantees and concessional loans; and (iv) mechanisms to access international climate finance from multilateral sources such as the GCF, CIF and development partners. Together, these elements help ensure that sufficient capital is directed toward both mitigation and adaptation priorities while maintaining fiscal sustainability.

Table 1: Key legal features of selected national climate laws

Country / Region	Name of Law / Year Enacted	Main Legal Target	Institutional and Monitoring Mechanism	Distinctive Features and Significance
United Kingdom	Climate Change Act (2008, amended 2019 **and 2024**)	Net Zero by 2050; 100 % reduction vs 1990 baseline	Climate Change Committee (CCC) - independent advisory body reporting directly to Parliament	First country in the world to legislate net-zero; establishes statutory five-year carbon budgets and mandatory reporting. 2024 amendment introduced a legal duty to align all carbon budgets with a 1.5 °C pathway.
France	Loi Énergie-Climat (2019)	Carbon neutrality by 2050; 40 % GHG reduction by 2030	Haut Conseil pour le Climat - independent council under the Prime Minister's Office	Embeds climate objectives into energy, industrial, and public finance planning; mandates public progress reporting
Sweden	Climate Act (2017)	Net Zero by 2045; 63 % GHG reduction by 2030	Government must submit annual climate reports to Parliament	Earliest OECD net-zero target; requires annual "Government Climate Reports" and four-year climate action plans
Denmark	Danish Climate Act (2020)	Net Zero by 2050; 70 % emissions reduction by 2030	Independent Climate Council monitors national climate policy	Legally enshrines transparency and independent oversight; obliges government to publish annual plans
New Zealand	Climate Change Response (Zero Carbon) Amendment Act (2019)	Net Zero by 2050 (excluding biogenic methane from agriculture); enhanced adaptation	Climate Change Commission - independent advisory body to government	Combines mitigation and adaptation in one law; separate legal target for agricultural methane
Germany	Federal Climate Protection Act (2019,	65 % reduction by 2030; Net Zero by 2045	Expert Council on Climate Issues (ERK); Federal	Establishes sectoral emissions budgets (energy, transport, industry); enforcement mechanism for missing targets. 2025

	amended 2021 and 2025)		Environment Ministry oversees monitoring	amendment introduced binding sanctions for sectors that breach budgets.
Canada	Canadian Net-Zero Emissions Accountability Act (2021)	Net Zero by 2050; interim targets for 2030, 2035, 2040	Independent monitoring body and National Advisory Committee on Climate Science	Requires progress reports every two years and five-year plans; legal consequences for non-achievement
Ireland	Climate Action and Low Carbon Development Act (2015, amended 2021)	Net Zero by 2050; 51 % reduction by 2030	Climate Change Advisory Council (CCAC)	Embeds inter-ministerial coordination and balance between mitigation and adaptation in law
European Union	European Climate Law (2021)	Climate neutrality for the bloc by 2050; 55 % GHG reduction by 2030 (new 2040 target of-90 % adopted October 2025)	European Commission oversees; "Fit for 55" (now "Fit for 90") package	Legally binding on all 27 Member States; cross-border monitoring and integration into green finance policy
South Korea	Framework Act on Carbon Neutrality and Green Growth (2021)	Net Zero by 2050; 40 % reduction by 2030 (vs 2018)	Presidential Commission on Carbon Neutrality and Green Growth	Single law integrating finance, energy, industry, and technology-innovation policies

Source: Compiled from OECD (2024) with additional updates by the author in 2025

1.3 Perfecting the Governance Framework for the Green Transition

1.3.1 Evolution Toward Adaptive Governance for the Green Transition

Purposeful policy coordination, rooted in strong institutional capacity and broad societal consensus, is required to deliver the green transition.

The green transition cannot occur spontaneously through technological progress or market signals alone; it demands purposeful policy coordination underpinned by robust institutions and societal consensus. Governance for the green transition is therefore designed to create a public-administration system that is strong, adaptive, and outcome-oriented, capable of steering the transition at both national and international scales.

According to OECD (2025), governance for the green transition is the way in which governments and public-administration bodies design, implement, and monitor policies to promote an effective, equitable, and accountable transition. The European Commission (2021), in its technical guidance for implementing the European Green Deal, defines green-transition governance as the process of integrating environmental policy into national development strategies. The core of this approach is to ensure that all economic and social policies are closely aligned with climate and sustainability objectives. The Commission highlights risk-monitoring tools, impact assessments, and cross-sectoral policy coordination as the foundation for a fair, effective, and accountable transition. Similarly, the International Business Council (IBC, 2022) emphasises that the essence of governance lies in establishing and operating a coherent, transparent, and enabling legal framework that allows governments to promote green economic policies, strengthen cross-ministry coordination, and mobilise resources.

Historically, public governance focused on efficiency and compliance in budget management, regulation, and public-service delivery. The realities of climate change and sustainable-development imperatives, however, have necessitated a shift from a compliance-based administrative model to an adaptive governance model capable of multi-level, multi-sector, and multi-stakeholder coordination. The objective is no longer merely to implement isolated climate policies but to restructure the entire state-governance system so that green objectives are embedded in routine government decision-making. The OECD argues that government acts as an intermediary in shaping the transition: facilitating private-sector investment in green sectors, fostering technological innovation, and simultaneously ensuring the process is fair and inclusive. This requires governments to “green themselves”, from green public procurement and green infrastructure investment linked to long-term fiscal strategies, to tax, expenditure, and public-finance reforms that promote environmentally friendly consumption, production, and investment, and to enhancing public-sector capacity, particularly in data, measurement, and policy-evaluation for green outcomes.

To achieve green-transition governance, the OECD (2025) proposes a three-pillar framework designed to overcome common institutional barriers and accelerate the transition in high-

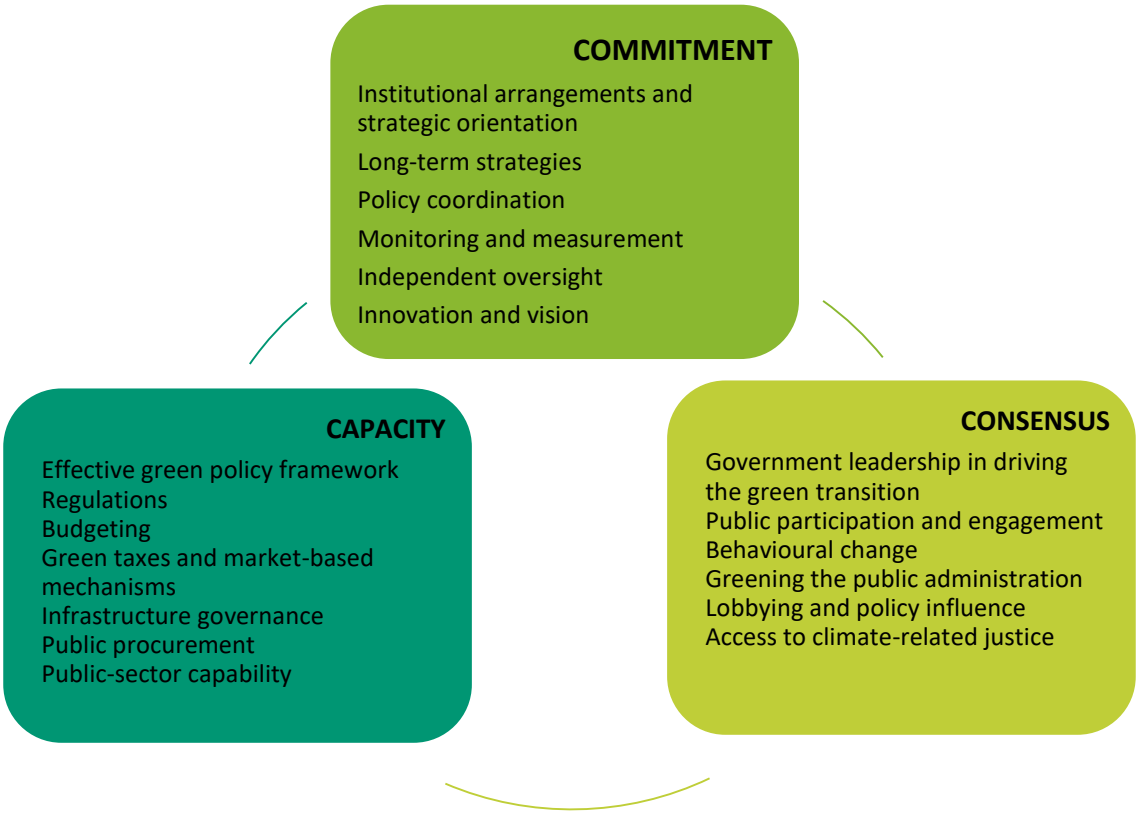
emission sectors. These three pillars represent the core dimensions of state capacity in the green-transition era and reflect the evolution of modern public governance from compliance management to adaptive and collaborative governance, in which government, business, and citizens jointly participate in a systemic, long-term transformation process:

(1) **Pillar 1 - Strengthening commitment** through clear mechanisms, policies, and long-term strategic orientation, including: (i) innovating governance models to lead the green transition; (ii) reinforcing the central role of government; (iii) developing long-term national strategies that establish cross-ministry coordination bodies and integrate climate goals into national development plans-clear institutional mechanisms enable governments to direct action, allocate responsibilities, and ensure consistency across all levels of administration; (iv) continuous monitoring and measurement of progress toward climate targets.

(2) **Pillar 2 - Enhancing capacity** through effective green policy frameworks. Capacity here is understood broadly to encompass human, institutional, financial, and governance capacity - i.e., the ability of the public sector to embed climate objectives throughout the entire policy, budget, and public-investment cycle. This pillar comprises seven elements: (i) effective green policy framework; (ii) regulation; (iii) budgeting; (iv) green taxation and market mechanisms; (v) infrastructure governance; (vi) public procurement; (vii) public-sector capacity.

(3) **Pillar 3 - Building consensus**, achieved when: (i) government leads the green transition; (ii) public participation and engagement; (iii) behavioural change; (iv) greening public administration; (v) lobbying and policy influence; (vi) access to climate justice.

Figure 2: Green transition governance framework



Source: OECD (2025)

Role and Necessity of the Green-Transition Governance Framework

Achieving global climate goals requires the full mobilisation of society - public sector, private sector, and citizens. For most governments, this is not simply a matter of adjusting a few isolated environmental policies but a comprehensive transformation of institutions, policies, and legal frameworks. Only then can public-governance systems deliver the capacity to design, implement, and monitor climate policies consistent with the Paris Agreement and net-zero emissions objectives.

In practice, although many countries have set net-zero targets and published long-term climate strategies, implementation continues to face significant challenges. The root cause is not a lack of political commitment but the absence of an integrated and effective governance framework capable of coordination across ministries, levels of government, and the private sector. According to OECD policy evaluations (2024), most countries still maintain separate strategies for energy, transport, industry, and environment without unified coordination mechanisms to ensure mutual reinforcement. Monitoring and evaluation systems remain weak, especially in linking climate goals to public-investment planning and national budgets. Institutional barriers, capacity constraints, and poor cross-ministry coordination are the primary reasons for slow progress in meeting international commitments.

In this context, the green-transition governance framework serves as a foundational guide, helping countries build strong, consistent, and effective public-governance mechanisms. It

underscores the need for clear institutions, policies, and regulations that provide the basis for long-term planning and cross-sectoral coordination. This is a prerequisite for embedding climate objectives throughout the entire policy cycle, from strategic planning and law-making to budget allocation, public investment, and procurement.

Through this framework, governments can demonstrate leadership by "greening" their own operations, from infrastructure and energy to vehicles, operational processes, and public decision-making. Integrating green objectives into the governance system not only ensures efficient use of financial and technical resources but also enhances transparency, accountability, and integrity in public administration.

Moreover, evidence-based measurement, monitoring, and policy-impact evaluation are essential to maintaining public trust and ensuring the sustainability of the green transition. According to OECD (2025), only when governments establish a unified governance framework, in which every agency, level of government, and economic sector has clearly defined roles and responsibilities, can the green transition proceed effectively, equitably, and with genuine societal impact.

Thus, the green-transition governance framework provides a governance blueprint that helps countries ensure their public-governance mechanisms support the climate transition, thereby enabling governments to operate within their own governance structures to be fully prepared for the green transition.

1.3.2 Strengthening Commitment through Clear Mechanisms, Policies, and Long-Term Strategic Orientation

Innovating governance models to lead the green transition

Shift from project-based governance to mission-oriented governance, in which government provides direction and leadership while ministries, local authorities, and the private sector implement in a unified manner (see Annex 1). The aim is to create an overarching coordination structure that links policy, institutions, law, and finance to achieve economy-wide emissions-reduction targets. A "climate mission" under this model is defined by clear criteria: measurable objectives, specific deadlines, multi-level and cross-ministry coordination mechanisms, and implementation through diverse policy tools (regulation, financial incentives, public investment, and innovation support). This approach helps governments avoid fragmentation and inefficiency while strengthening policy coordination and efficient public-private resource mobilisation. The OECD also emphasises the role of strategic foresight in mission-oriented governance, enabling governments to identify long-term trends early, anticipate risks, and integrate them into policymaking, thereby ensuring proactive, flexible, and sustainable green development.

Strengthening the central role of government

Effective green transition requires government to play a central role in direction-setting, coordination, and oversight of climate-policy implementation. Many countries have established national climate-coordination bodies to enhance connectivity across ministries, local authorities, and the private sector. Such bodies typically report to the Prime Minister's Office or operate independently, with advisory, monitoring, and consistency-assurance functions for nationwide climate-policy implementation.

Numerous OECD countries have created advisory, monitoring, and cross-ministry climate-coordination bodies, including France (HCC), Germany (ERK), Denmark (DCCC), Ireland (CCAC), New Zealand (CCC), and South Korea (PCGG). These countries regard independent or semi-independent climate advisory and coordination institutions as critical components of green-transition governance frameworks (see Table 1-2 and 1-3).

Box 1: South Korea's green-transition policy coordination mechanism

To ensure unified implementation, South Korea established the Presidential 2050 Carbon Neutrality and Green Growth Commission under the Office of the President. The Commission develops the national carbon-neutrality roadmap, monitors emissions-reduction targets, and coordinates among ministries (Economy & Finance, Environment, Industry-Trade-Energy, Science & Technology) and local governments. Its three-pillar coordination structure comprises:

i) Finance mobilisation (MOEF)
ii) Industrial/energy policy (MOE & MOTIE), and
iii) Central evaluation of emissions performance

The OECD (2023) rates this as one of Asia's most effective multi-ministry governance models.

Despite differing organisational forms, these bodies share three common features: operational independence from the executive to ensure objectivity and transparency; long-term strategic monitoring, evaluation, and advice linked to net-zero goals; and public reporting with policy-feedback mechanisms that reinforce societal trust and policy stability. They embody the OECD-recommended principle: "Place government at the centre of the green transition, supported by an independent expert coordination body that guarantees consistency, transparency, and accountability of national climate policy."

Box 2: Japan's green-transition policy coordination mechanism

Japan's transition-finance framework is coordinated by three core ministries, including METI, FSA, and MOE, which jointly issued the Basic Guidelines on Climate Transition Finance (2021, updated 2023), adapted from the ICMA handbook to Japan's economic context. The

guidelines establish four criteria for “transition” activities: credible decarbonisation pathway aligned with 2050 neutrality, feasible technology and sustainable financing strategy, third-party verification (Second Party Opinion), and regular public reporting.

The Green Transformation (GX) Council, directly under the Prime Minister’s Office, oversees energy, climate, and green-finance strategy. Beneath it, the GX League now includes over 680 companies representing ~40 % of national emissions, all publishing decarbonisation roadmaps and ESG reports (METI, 2024). The GX Economy Promotion Agency, launched in July 2025, now channels public-private transition bonds. The OECD (2024) considers this standardisation of transition-finance concepts a cornerstone for an effective green financial market.

Table 2: Selected national climate policy coordination and advisory bodies worldwide

Country	Body Name	Year / Legal Basis	Reporting Line	Nature of Operation	Main Functions
United Kingdom	Climate Change Committee (CCC)	2008 - Climate Change Act 2008	Reports directly to Parliament, independent of government	Independent parliamentary advisory body	Advise on net-zero targets and interim pathways; independent assessment of ministerial performance; annual public monitoring reports and policy recommendations
Germany	Expert Council on Climate Issues (ERK)	2019 - Federal Climate Protection Act	Federal Government	Independent scientific advisory council	Annual verification of national emissions data; assess policy-target alignment; issue correction demands if targets at risk
Germany (former)	Coal Commission	2018 - Federal Government decision	Multi-stakeholder (government, industry, civil society)	Multi-stakeholder dialogue mechanism	Planned coal phase-out by 2038; created ~300 000 green jobs
France	Haut Conseil pour le Climat (HCC)	2018 - Presidential decision	Prime Minister's Office	Independent expert council	Strategic advice ensuring Paris alignment; sector-by-sector progress monitoring; direct reporting to Prime Minister and Parliament
New Zealand	Climate Change Commission (CCCNZ)	Post Zero Carbon Amendment Act	Government	Independent advisory and monitoring body	Oversee Act implementation; policy recommendations; ensure coherence across energy, industry, agriculture
Ireland	Climate Change Advisory Council (CCAC)	2015 - Climate Action and Low Carbon Development Act	Government	Independent advisory body with formal coordination role	Annual effectiveness assessments; advise on National Climate Action Plan updates; ensure finance-environment-energy coordination

Denmark	Danish Council on Climate Change	2014 - Danish Climate Act	Independent, reports to Parliament	Scientific, economic, and societal council	Advise on medium- and long-term targets; monitor ministries; public reporting to Parliament and citizens
South Korea	Presidential Commission on Carbon Neutrality & Green Growth	2021 - Presidential decision	Office of the President	Cross-ministry coordination body	Develop 2050 carbon-neutrality strategy; monitor inter-ministry progress; propose annual adjustments

Source: Compiled from OECD (2024) with additional updates by the author in 2025

Developing Long-Term National Strategies and Integrating Climate Objectives into National Development Plans

Clear institutional mechanisms enable governments to direct action, allocate responsibilities, and ensure consistency across all levels of administration, from central to local. Commitments gain true value only when manifested through interconnected, measurable long-term strategies and action plans. Long-term strategies must meet three key requirements: (i) articulate a unified vision for emissions reductions, enhanced resilience, and energy-system transformation; (ii) specify milestones and pathways to achieve targets, accompanied by detailed cost-benefit analyses; (iii) secure approval at the highest governmental level to ensure political binding.

Numerous countries have adopted long-term climate strategies. The first step for public institutions to commit reliably to sustained climate action is to establish clear long-term policy frameworks and set overarching as well as interim targets aligned with those frameworks. According to OECD (2025), by 2022, 20 out of 24 data-available countries (83 %) had adopted net-zero strategies. Among them, 27 OECD and EU countries have enshrined these targets in legal frameworks, covering 16 % of global emissions; however, significant implementation gaps persist. Countries such as the United Kingdom, France, Germany, South Korea, Denmark, and Luxembourg have either adopted or are executing institutionalised long-term climate strategies, demonstrating high commitment within OECD green-transition governance frameworks. Global trends show a marked increase in promoting such strategic frameworks, extending beyond developed economies to the Global South and emerging markets.

The European Union (EU) adopted the European Green Deal, an integrated strategy linking climate, industry, finance, and energy, positioning carbon neutrality at the heart of development policy. Japan issued its 2050 Carbon Neutrality Strategy, committing to energy-structure transformation, technological innovation, and sustainable consumption promotion. South Korea embeds its “Green Growth” strategy into national development plans, ensuring connectivity between climate transition and economic recovery.

Japan is widely recognised as a pioneer in Asia not in green growth policy overall, but specifically in designing a multi-objective green-finance and transition-finance framework that supports decarbonisation while maintaining industrial competitiveness-particularly in hard-to-abate sectors. Unlike the EU taxonomy, which prioritises excluding high-emission activities, Japan introduced the Transition Finance model to help energy-intensive industries decarbonise gradually through credible transition pathways. This approach forms a core element of the Green Transformation Strategy (GX Strategy), announced in 2021 to guide Japan toward its 2050 carbon-neutrality target (METI, 2023).

In contrast, South Korea has been internationally recognised as the first country to adopt green growth as a national development priority. Its landmark National Strategy for Green Growth (2009-2050) and the Five-Year Green Growth Plan (2009-2013) positioned Korea as a

global frontrunner in green-growth policy architecture (OECD, 2012; GGKP, 2013). These foundational frameworks predate both Japan's GX Strategy and the EU Green Deal.

Building on this earlier foundation, Korea launched the Korean New Deal (2020)-with the Green New Deal as one of its three pillars (alongside the Digital and Inclusive New Deals)-to advance a "green-digital-inclusive economy" and support post-pandemic recovery. The Green New Deal allocates 114.1 trillion KRW (approx. 75 billion USD) for 2020-2025, including 42.7 trillion KRW in public funding and the remainder from financial institutions and the private sector. The programme is projected to create over 1.9 million green jobs and contribute 0.7 percentage points to annual GDP growth (Agora Energiewende, 2022; Government of Korea, 2021; UNDP, 2021).

The two cases therefore illustrate different types of pioneering leadership. Japan in green finance and transition-finance innovation. Korea in early adoption of national green-growth strategies and whole-of-government climate-economic planning.

Table 3: Summary of Japan and South Korea's Green-Growth and Green-Finance Frameworks

Country	Key Framework / Strategy	Year Introduced	Core Focus	Why It Is a "Pioneer" Case
Japan	Green Transformation (GX) Strategy	2021	Transition finance, industrial decarbonisation, green investment mechanisms	First in Asia to introduce a comprehensive Transition Finance framework supporting heavy industries to decarbonise in phases
	Basic Guidelines on Transition Finance	2021	Financing pathways for hard-to-abate sectors	Influential model shaping Asia's green-finance standards
South Korea	National Strategy for Green Growth (2009-2050)	2009	Green-growth vision, whole-of-government green-growth governance	First country globally to adopt green growth as a national development paradigm

	Five-Year Green Growth Plan (2009-2013)	2009	Investment roadmaps, governance system (Presidential Committee on Green Growth)	Institutionalised green growth at the centre of economic planning
	Korean New Deal (Green New Deal pillar)	2020	Green investment, RE expansion, digital-green integration	Demonstrates how Korea integrated climate, technology and industrial policy

The UNDP Report (2023) indicates that the Green New Deal enabled South Korea to achieve a 12 % reduction in carbon intensity during 2015-2023, with the share of renewables in the electricity mix rising from 6 % in 2018 to 21 % in 2023, and over 200,000 new jobs created in the clean-energy sector alone. Alongside positive outcomes, the Agora Energiewende Report (2022) identifies three main challenges: (i) heavy industries (steel, chemicals, shipbuilding) still account for over 30 % of total emissions, exerting pressure on carbon-neutrality targets; (ii) green-finance incentives remain heavily reliant on public capital, without breakthroughs in private investment; (iii) the absence of a comprehensive national carbon-market legal framework limits emissions pricing.

To address these challenges, the South Korean government issued the National Carbon Neutrality Strategy (2021), setting a 40 % emissions reduction from 2018 levels by 2030 (Nationally Determined Contribution - NDC) and introducing a “green credits and carbon tax” mechanism scheduled for implementation from 2026. As of November 2025, the carbon tax has been piloted in the power sector, with full rollout deferred to 2027 amid industry consultations.

China has established a nationwide emissions-governance and green-finance system, synchronising market tools with public-fiscal policies. This shift gained momentum following President Xi Jinping’s 2060 carbon-neutrality pledge at the United Nations (UNGA 75, 2020) and was specified in the National Green Development Strategy and Green Finance Framework (NDRC & PBoC, 2021). China’s national ETS now covers 2,200 power plants and has expanded to steel in 2025, trading over 200 million tonnes of CO_2 equivalents annually.

Governments are building clear legal frameworks to guide long-term planning, with a focus on integrating net-zero objectives into national strategies. Institutional commitments must be reinforced by binding legal regulations and transparent monitoring mechanisms. Currently, around 30 OECD countries have enacted National Climate Laws or equivalents; examples include France’s 2019 Energy and Climate Law mandating a 40 % reduction by 2030;

Germany's 2021 amended Climate Protection Act targeting neutrality by 2045; and Denmark's 2020 Climate Act requiring annual government progress reports and parliamentary accountability. These legal frameworks transform political commitments into legal obligations, enhancing policy stability and predictability.

Monitoring and Measurement for Tracking Progress on Climate Targets

Monitoring and measurement form the foundation for ensuring accountability in the green transition. Countries must develop unified data systems, establish specific, achievable, time-bound key performance indicators (KPIs), and leverage open-data platforms, digital government, and big-data analytics to track emissions, green spending, and policy impacts. Nations such as France and Germany have delegated overall strategy implementation oversight to government-established national climate-coordination bodies. However, in practice, many countries face difficulties in evaluating the real-world effectiveness of adaptation policies.

National Climate Policy Monitoring Systems According to OECD (2025), national climate-policy monitoring systems play three core roles in green-transition governance frameworks: (i) ensuring transparency and accountability-independent mechanisms publicise progress, data, and policy outcomes, thereby reinforcing societal trust; (ii) supporting evidence-based policy adjustment, where periodic reports and emissions data enable early detection of deviations and timely corrections; (iii) enhancing cross-ministry coordination and operational capacity - national systems link climate objectives to fiscal, energy, transport, industrial, and social-welfare policies.

Current international trends show countries strongly institutionalising independent climate-monitoring mechanisms to guarantee accountability, transparency, and long-term policy stability. OECD (2025) notes that over 70 % of member countries have established independent or semi-independent climate-monitoring bodies, reflecting a shift from "administrative monitoring" to "institutional monitoring". Countries such as the United Kingdom, France, Germany, Ireland, Denmark, New Zealand, and South Korea have all set up national climate-policy monitoring systems in the form of expert councils, independent commissions, or cross-ministry coordination bodies. These models are now OECD-recommended as advanced institutional standards in climate governance, ensuring climate commitments translate into measurable, monitorable, and adjustable actions over time. Specifically:

- **European Model (United Kingdom, France, Germany, Ireland, Denmark):** Exemplifies "independent and science-driven climate policy monitoring". Bodies like the CCC (United Kingdom) or HCC (France) have the authority to publicly evaluate, recommend policies, and compel government responses. This approach maintains green-transition consistency regardless of political changes while generating "positive societal pressure" through media and public opinion.

- **Asian Model (South Korea, Japan):** Leans toward "coordinated internal government monitoring" to ensure executive unity, particularly in centralised administrations. This enhances policy coordination but often requires supplementary independent scientific input to mitigate administrative bias risks.

- In Canada, the National Climate Council (established 2021) coordinated federal-provincial planning for a 40 % reduction by 2030, resulting in a 15 % increase in renewable investments and a 10 % national energy-cost reduction from 2021-2024. Its success stems from integrating climate-risk assessments into planning for timely forecasting and adjustments. Similarly, Australia's Climate Change Authority (since 2015) steered energy transitions, raising renewables from 20 % to 35 % of total supply by 2024 and creating 200,000 new green jobs. These outcomes demonstrate that inter-ministry mechanisms effectively allocate responsibilities and reduce sectoral conflicts. Australia's authority expanded in 2025 to include mandatory adaptation-risk audits for federal projects.

- However, implementation realities in some countries highlight challenges when institutional mechanisms lack clarity. India's National Climate Committee (established 2008) suffers from poor inter-ministry coordination, achieving only a 5 % emissions reduction from 2015-2023 against a 20 % target. This underscores how weak policy frameworks undermine investment efficiency despite abundant resources.

A standout commonality among these models is transforming climate objectives into legal obligations with periodic monitoring and mandatory feedback. This creates a continuous "policy-monitoring-adjustment" cycle, elevating governance capacity and policy predictability.

Overall, the prevailing global trend treats independent climate monitoring as the third pillar of green-transition governance frameworks, alongside policy design and climate finance. This marks a pivotal shift: from politically symbolic commitments to evidence-based, monitored, and socially accountable execution, the bedrock for sustaining mid-21st-century carbon-neutrality objectives.

Table 4: National climate-monitoring institutional models in selected OECD countries

Country	Climate Monitoring Body	Structure and Main Role	Key Features / Outcomes
United Kingdom	Climate Change Committee (CCC)	Independent body monitoring emissions progress, policy evaluation, and annual "Progress Report" to Parliament	OECD exemplar for independent accountability; generates positive political pressure and ensures policy continuity across terms
France	Haut Conseil pour le Climat (HCC)	Independent council under Prime Minister; periodic evaluation of climate policy progress, especially the Energy-Climate Plan (PPE)	Combines political and scientific expertise; public reporting builds societal trust and enhances transparency
Germany	Expert Council on Climate Issues (Expertenrat für Klimafragen - ERK)	Independent body verifying annual emissions data, assessing sectoral target achievement, and demanding remedies for breaches	Creates continuous "policy feedback loop" between monitoring and adjustment; high transparency and accountability
Ireland	Climate Change Advisory Council (CCAC)	Monitors five-year carbon budgets, evaluates climate-spending effectiveness, and produces annual reports	Multi-tier monitoring linking central-local policy; promotes societal dialogue
New Zealand	Climate Change Commission (CCCNZ)	Oversees national carbon budgets, provides policy recommendations, and requires public government responses	Technical-political hybrid model; boosts government accountability
Denmark	Danish Council on Climate Change (DCCC)	Independent body evaluating emissions-reduction progress, energy policy, and green public investment	Ensures transparency, multi-stakeholder dialogue, and objectivity in monitoring
South Korea	Presidential Commission on Carbon Neutrality and Green Growth (PCGG)	Multi-ministry commission chaired by the President, synthesising and coordinating national climate plans	Whole-of-government internal model; enhances institutional cohesion and cross-ministry coordination

Source: Compilation from OECD (2025)

1.3.3 Enhancing Institutional Capacity for the Green Transition

From Policy Formulation to Effective Institutional Implementation

The global trend in green-transition governance has shifted decisively from the mere promulgation of policies and strategies to the systematic building of institutional capacity, governance structures, and public-administration skills that ensure those policies are implemented effectively and durably. The OECD (2025) describes governance capacity as the "prerequisite" for maintaining policy stability and coherence, particularly as carbon-neutrality objectives are mainstreamed across all economic and social domains.

In this context, countries are no longer investing solely in legal frameworks but are prioritising the strengthening of three core pillars of modern green governance: institutions, infrastructure, and human capital.

Institutional Arrangements for Delivering an Effective Green Policy Framework

Building an effective green policy framework requires not only clear objectives, but also institutional arrangements capable of coordinating policy design, budgeting, implementation and monitoring across government. Rather than re-stating the conceptual foundations of green-transition governance (discussed in Section 1.3.1), this section focuses on the organisational structures, decision-making mechanisms and institutional capacities that enable governments to operationalise green policies in practice.

A central institutional requirement is the systematic integration of climate objectives into core state functions—national development planning, fiscal policy, regulatory design, infrastructure governance and public investment. OECD evaluations show that countries that have established formal inter-ministerial coordination mechanisms, mandatory climate-impact assessments, and unified planning-budgeting systems are better able to avoid fragmented policies and deliver coherent long-term strategies.

International experience demonstrates that institutional architecture-not only policy content-determines the credibility and execution of green policies.

- **United Kingdom:** The Net Zero Strategy is supported by an integrated institutional framework linking planning, budgeting and monitoring, overseen by an independent statutory body (the Climate Change Committee), which enhances transparency and compliance.
- **Germany:** The National Climate Plan operates under a legally mandated "climate governance cycle", requiring annual sectoral monitoring reports and corrective action if progress deviates from targets.
- **United States:** The Inflation Reduction Act (IRA) functions through a whole-of-government delivery mechanism coordinated across the Treasury, Department of Energy and Environmental Protection Agency, enabling efficient deployment of green tax credits, grants and loan guarantees.

- **South Korea:** The Green New Deal established dedicated delivery units responsible for hydrogen, digital infrastructure and green innovation, ensuring continuous alignment between fiscal measures and national industrial policy.
- **China:** Institutional arrangements include centralised planning supported by state development banks that finance green industrial upgrading, enabling China to scale battery and solar manufacturing rapidly.

These examples show that effective green policy frameworks are not stand-alone environmental measures; they rely on well-designed institutions, clear mandates, robust coordination mechanisms and stable financing channels that embed climate goals into the core machinery of the state.

Box 3: The EU Taxonomy for Sustainable Activities

The EU Taxonomy, established under Regulation (EU) 2020/852, is the official classification system that defines which economic activities can be considered environmentally sustainable. It provides a common language for companies, investors, and regulators to identify, assess, and report sustainable activities in a consistent, transparent, and science-based manner.

An activity qualifies as sustainable only if it:

1. substantially contributes to at least one of the EU's six environmental objectives (climate-change mitigation, climate-change adaptation, sustainable use and protection of water and marine resources, transition to a circular economy, pollution prevention and control, and protection and restoration of biodiversity and ecosystems);
2. does no significant harm to any other environmental objective;
3. complies with minimum social safeguards (OECD and ILO guidelines); and
4. meets technical screening criteria that are science-based and periodically updated.

The Taxonomy is the cornerstone of the EU's Sustainable Finance Strategy, designed to steer investment flows towards projects that support the EU's 2030 climate and energy targets and net-zero by 2050 under the European Green Deal. Financial institutions, large companies, and public authorities in the EU are required to report the degree of Taxonomy-alignment of their portfolios or activities. The mechanism combats greenwashing and enhances transparency in capital markets. It also underpins other EU instruments, including the Corporate Sustainability Reporting Directive (CSRD) and European Sustainability Reporting Standards (ESRS), as well as the EU Green Bond Standard (Regulation (EU) 2023/2631), which mandates that proceeds from green bonds be allocated exclusively to Taxonomy-aligned activities.

Green policy frameworks are now being shaped significantly by geopolitical, trade, and global-supply-chain dynamics. The EU's CBAM is a trade and climate-policy tool intended to protect domestic producers from carbon leakage and level the playing field with jurisdictions that have weaker climate policies. In the United States, the IRA prioritises North American (or

FTA-partner) manufacturing to reduce reliance on geopolitically sensitive supply chains, particularly for critical minerals. India has launched Production-Linked Incentive (PLI) schemes to establish domestic battery and solar-energy supply chains, thereby mitigating geopolitical risks and import dependence.

Many countries have introduced policies that explicitly address inequality in climate action, recognising just transition as an essential pillar of equitable green transformation. A sustainable green transition cannot be separated from social justice and gender equity. Governments must design and implement climate policies grounded in fairness, inclusivity, and transparency, ensuring that all societal groups, particularly the poor, women, and directly affected communities, are consulted, benefit, and have their rights protected.

- The United Kingdom has embedded financial benefits within its 2050 Net Zero Strategy through the 2021 Just Transition Framework, providing targeted support for regions affected by coal and gas phase-out. To overcome local resistance to new renewable infrastructure (often driven by job-loss fears and infrastructure costs), the UK adopts a "shared financial benefits" approach: (i) enhanced unemployment benefits (up to 80 % of previous salary for six months) combined with fully funded green-skills training (e.g., wind-turbine technicians with £5,000 annual scholarships); (ii) a £1 billion Economic Diversification Fund (to 2025) that finances local regeneration - for instance, converting former coal mines into green logistics hubs, creating 10,000 new jobs in the North East at average salaries of £35,000; (iii) green tax credits allowing SMEs to deduct 30 % of solar-installation costs, reducing energy bills by 15-20 % annually. Outcomes: unemployment in former coal regions fell from 12 % (2019) to 7 % (2024); the Dogger Bank offshore-wind project delivered £2.5 billion in regional economic benefits, with 40 % allocated to local communities via profit-sharing funds. This approach has not only reduced conflict but boosted regional GDP growth by 2.5 % annually through green investment.
- Canada mainstreams gender equity and Indigenous rights into its climate policies, establishing capacity-building and consultation mechanisms to ensure Indigenous communities are active decision-making partners rather than merely impacted parties in the energy transition.
- The European Union's Just Transition Mechanism, including the Just Transition Fund (JTF), supports fossil-fuel-dependent regions with retraining, job transition, green-infrastructure investment, and local-enterprise development, ensuring no region or worker is left behind.

Green Infrastructure Governance - the Operational Backbone of the Green Transition

Public infrastructure constitutes the physical backbone of the green transition. The prevailing trend is the systematic integration of climate-impact assessments, full life-cycle analysis, and multi-criteria evaluation into infrastructure selection, appraisal, and public-investment processes. The OECD (2025) notes that such methods not only improve the efficiency of public

investment but also demonstrate mature institutional capacity - the ability to balance economic, social, and environmental objectives in every investment decision.

Denmark and the Netherlands lead in applying quantitative emissions-impact modelling to transport and energy investments, thereby directing public capital towards projects with the highest climate returns.

Enhancing Public-Sector Capacity - the Human Core of Green Governance

The skills and expertise of public servants are the bedrock of successful green transformation. OECD governments regard the "greening of public-sector skills" as a strategic priority to ensure the civil service possesses sufficient climate-science knowledge, policy-analysis capabilities, strategic foresight, and cross-ministry coordination competence.

Canada's Greening Government Initiative includes the Climate and Nature Literacy project, which trains all federal public servants in climate change, ecological conservation, and sustainable development. Italy has embedded green-skills training within its National Recovery and Resilience Plan (NRRP), requiring local authorities to complete green-project management training before receiving investment funds. These programmes illustrate that public-sector capacity is not merely technical expertise but a profound cultural and institutional mindset shift, which must be driven by the highest political commitment.

1.3.4 Building Consensus in the Green Transition

Government Leadership in the Green Transition

Strong governmental leadership is the indispensable precondition for an orderly and credible societal green transition. Government must not only set the direction and build public trust but also become the largest emitter that voluntarily reduces its own footprint. Public-sector entities, as major consumers of energy, operators of buildings and fleets, and providers of services, can play a pivotal role by curbing their own emissions, establishing sustainable practices, and catalysing change across the entire public sector.

More than half of OECD member countries have launched initiatives to green their public administrations. Many have established voluntary schemes for public entities to improve environmental management and foster sustainable staff behaviour, while several have integrated green-public-administration commitments into national climate and sustainability laws and policies.

International initiatives such as the Greening Government Initiative provide platforms for countries to exchange best practices and set ambitious environmental targets for the public sector. For existing buildings and new facilities, public administrations are pursuing energy-efficiency retrofits, renewable-energy adoption, heating-system upgrades, and compliance with stringent environmental standards. Waste-minimisation targets (e.g., paper and food

waste) and office-optimisation measures are commonplace. In digital technology, OECD public administrations are widely adopting responsible, environmentally friendly digital infrastructure and operations.

Some countries have quantified public-sector emissions: Finland estimates that its public administration accounts for approximately 5 % of national CO_2-equivalent emissions; Canada reports nearly 1 %. These figures provide a clear basis for governments to set ambitious, time-bound reduction targets (typically 24-36 months), sending a powerful political signal: the state not only demands action from citizens but leads by example. When government "greens itself", it projects exemplary leadership, strengthens public trust, and creates societal ripple effects in the climate-transition process.

Public Engagement and Inclusion

Effective public engagement empowers citizens and mobilises climate action. This is not rhetoric but the operational mechanism of consensus. Climate action depends on citizens' willingness to change consumption patterns (e.g., choosing lower-embedded-carbon products or low-emission transport) and to accept new low-carbon infrastructure in their communities (onshore wind farms in rural areas or metro extensions in cities). Through consumption choices and legal challenges, citizens can significantly influence the pace and scale of climate action.

Policy Communication

The green transition will fail without robust public-sector integrity, as societal trust in the fairness of policies determines their legitimacy. The OECD warns that lobbying by vested interests poses a serious threat to integrity in climate policymaking. When traditional energy companies spend heavily to influence legislation, the risks of policy capture and biased outcomes rise. The OECD recommends that countries: (i) fully disclose all lobbying activities, objectives, targets, and methods; (ii) establish rigorous conflict-of-interest rules; (iii) strengthen oversight of political financing and publicly reveal corporate-political linkages on climate issues; (iv) bolster legal frameworks for integrity in policy consultation to prevent manipulation by vested interests. Progress remains uneven: only about half of OECD countries legally define lobbying and lobbyists, and just one-third have meaningful sanctions for breaches.

Transparent information and public communication raise awareness, promote evidence-based debate, counter harmful misinformation, provide channels for understanding public concerns, and explain the necessity of climate action. Governments must convey complex policy narratives in engaging, concise, and meaningful ways. Notable examples include the EU Council's "Taking the Lead on Climate Change" campaign and the UK's "Plant for Our Planet" initiative, which encourage concrete individual and community actions. Canada's experience with carbon pricing, where revenue was returned to citizens yet the policy was repealed due

to insufficient public support, underscores the critical importance of revenue allocation and communication for social acceptability.

Early and effective communication also highlights opportunities for feedback and negotiation, prompting inclusion and collaboration. This proactive approach reduces costly legal challenges and eases pressure on judicial systems. Managing expectations through timely, personalised communication leads to smoother environmental-policy implementation, lower economic and social costs, and a less conflictual path towards meeting climate commitments. To ensure genuine participation, governments should enable citizens to contribute to decision-making on specific local projects that tangibly affect their lives, rather than limiting input to late-stage consultation.

Behavioural Change

The green transition is a societal-scale behavioural transformation-from government and business to individuals. Achieving net-zero requires profound shifts in consumption choices, investment patterns, and energy use. Governments play a pivotal role in catalysing climate-friendly behavioural change, not only by influencing individual actions to reduce emissions but also by cultivating public support that shifts market dynamics on both supply and demand sides. Substantial progress towards net-zero demands large-scale strategies that reshape social norms, where behavioural shifts trigger broader systemic change. This requires a multi-level approach that considers individuals' intrinsic motivations, their behaviours, and how these interact with social, technological, and physical environments. Governments can harness behavioural science to understand public attitudes towards sustainability and identify drivers and barriers to adopting sustainable practices.

Canada's Programme of Applied Research on Climate Action (PARCA) integrates behavioural-science insights with policy analysis to promote climate action, using theories and methods from behavioural and social sciences to shape policies, programmes, and communication.

Greening Public Administration

Greening public administration means embedding climate and environmental considerations into organisational structures, daily operations, service delivery, and procurement. Key actions include measuring and reducing public-sector emissions; improving energy efficiency in buildings and fleets; prioritising renewable energy; and adopting environmentally friendly working, procurement, and digitalisation practices.

OECD international initiatives such as the Greening Government Initiative promote experience-sharing and green standards for public administration, thereby reducing environmental impact while enhancing government credibility and integrity in the eyes of the public.

Climate Justice and Ensuring a Just Transition

Climate justice is the ethical cornerstone of societal consensus. Energy transitions can generate unequal costs and benefits, disproportionately affecting vulnerable groups, local communities, and future generations. Judicial and administrative mechanisms - courts, audit institutions, ombudsmen, and conciliation bodies - must guarantee that every citizen has the right to complain, provide feedback, and receive compensation if adversely affected by environmental policies. Accessible, transparent, and cost-free grievance systems enable disputes to be resolved without complex litigation, preventing social conflict, reinforcing fairness, and increasing public acceptance of climate policies. The OECD also emphasises gender mainstreaming in green transition: with women still underrepresented as environment ministers and persistent gender pay gaps in the energy sector, comprehensive gender-responsive policies are essential to deliver justice and equal opportunity for all citizens.

1.4 Climate Finance as the Central Driver of the Global Green Transition

1.4.1 General Trends in Climate Finance

Climate Finance Becomes the Central Driver of the Global Green Transition

Climate finance has firmly established itself as the pivotal force in the transition to a low-emission, climate-resilient economy. Far beyond a mere support tool for environmental goals, it now serves as the macroeconomic regulator of the transition, steering investment, public expenditure, technological innovation, and the balance between economic growth and social equity. According to the Generali Group (2025), financial institutions, insurers, and institutional investors must treat climate-finance strategies as integral to overall risk management, given the direct impact of physical and transition risks on asset portfolios, liquidity, and financial stability. Thus, climate finance bridges the gap between commitment and action while mobilising and coordinating global resources to achieve net-zero emissions.

Over the long term, climate finance not only curtails emissions but also delivers substantial socio-economic co-benefits: lower energy costs, green job creation, improved public health, and enhanced energy security. Uncontrolled global warming could inflict economic losses of up to 15 % of global GDP by 2050 (at 2 °C) and 30 % by 2100 (at 3 °C). **The IPCC AR6 Synthesis Report (2023, reaffirmed 2025) now projects that exceeding 1.5 °C without rapid mitigation could trigger irreversible tipping points, amplifying losses to 20-25 % of GDP in vulnerable regions.** Building a sustainable, transparent, and inclusive climate-finance system is therefore not only an environmental imperative but a strategic safeguard for national economic and financial stability.

Sources and Instruments for Mobilising Climate Finance Are Increasingly Diverse

Climate capital is currently mobilised from three primary sources: (i) public capital, including national budgets and domestic development-finance institutions; (ii) private capital from households, corporations, commercial banks, insurers, and investment funds; and (iii)

international capital via bilateral and multilateral cooperation, notably from multilateral development banks (MDBs) and official development assistance (ODA). Key instruments include green and sustainability bonds for renewable-energy and resilient-infrastructure projects; carbon pricing to generate reinvestable revenues for adaptation; blended finance and public-private partnerships (PPPs) to share risk; and climate-investment funds and climate-risk insurance. These tools form a multi-layered climate-finance ecosystem that expands scale and enhances capital-efficiency worldwide. The global outstanding stock of labelled green, social, and sustainability bonds exceeds USD 4.2 trillion, with transition bonds growing fastest at 38 % year-on-year (Climate Bonds Initiative, 2025).

Public Finance - the Stable Foundation of the Global Climate-Finance System

According to the Climate Policy Initiative (CPI, 2025), public finance remains the bedrock of the climate-finance system, providing long-term, stable capital that catalyses private and international flows. The three principal public sources are: (i) national budgets, funding public investment and recurrent climate-related expenditure; (ii) bilateral ODA, focused on supporting developing countries in climate response; and (iii) concessional loans and grants from MDBs. These sources are regarded as the "stable pillar" that sustains climate-capital flows even amid market volatility, high interest rates, and global fiscal tightening.

Comparatively, national budgets dominate, accounting for 93.3 % of total global climate-related budgetary allocations in 2023. Bilateral ODA and MDBs allocate 88 % and 89 % respectively to mitigation, but prioritise adaptation more heavily (12 % and 11 %). Growth trends 2021-2023 versus 2018-2020 show national budgets up 30 %, bilateral ODA up 31 %, and MDB capital up 203 %, highlighting the rapid expansion of multilateral financing. Regionally, China leads in domestic mitigation budgets (USD 298 billion in 2023), while sub-Saharan Africa and Latin America receive the largest shares of ODA and MDB adaptation finance. This structure reflects a more rational allocation across public sources, aiming for efficient mobilisation, flexible deployment, and equitable adaptation in the global climate-finance system.

Strong Growth in Climate-Finance Scale During 2021-2023

CPI (2025) reports total global climate finance reached USD 1.9 trillion in 2023, a 15 % increase year-on-year, projected to surpass USD 2 trillion in 2024. The 2021-2023 period recorded an average annual growth of 26 %, more than triple the 2018-2020 rate. For emerging markets and developing economies (EMDEs), climate finance hit USD 196 billion in 2023, 78 % from public sources-nearly triple the 2018 level. This signals a clear global investment shift towards low-emission sectors such as renewables, transport electrification, and green infrastructure.

Nevertheless, global climate investment remains insufficient to maintain a 1.5 °C pathway. CPI and others estimate annual needs of USD 5-7 trillion or more over the coming decade (OPEC Fund, 2025). The UNEP Adaptation Gap Report 2025 now raises the lower-bound estimate for

adaptation finance in developing countries to USD 340-560 billion annually by 2030, against current flows of USD 46 billion.

Global Climate-Finance Structure Remains Imbalanced, Heavily Skewed Towards Mitigation

Climate finance comprises two pillars: mitigation finance and adaptation finance. Despite shared goals of resilience and emission reduction, a stark imbalance persists: approximately 70 % of global flows target mitigation, while adaptation receives under 10 % (CPI, 2025). Mitigation finance reached USD 1.78 trillion in 2023; adaptation finance stood at USD 65 billion. Required adaptation costs in developing countries are estimated at USD 215-387 billion annually, yet actual flows were only USD 21 billion in 2021 (UNEP, 2023). The consequence is a persistent gap between commitment and delivery. International assessments highlight that inadequate policy tools and insufficient finance hinder climate-action progress.

Mitigation finance surged from USD 757 billion in 2018 to USD 1.78 trillion in 2023, driven by renewables, clean transport, and energy-efficient buildings. Adaptation finance, though growing 26 % from the 2018-2020 average, reached only USD 55 billion annually in 2021-2023. Public sources dominated adaptation (57 %) and private accounted for the rest (43 %) and of which international sources contributed 78 %, reflecting high degree of dependence on global support in developing economies.

This asymmetry risks systemic under-investment, particularly in climate-vulnerable nations. CPI estimates global adaptation needs of at least USD 400 billion annually by 2030, compared with current flows of only USD 46 billion, leaving a widening financing gap. A growing concern relates to equity: in many developing countries, adaptation finance is predominantly delivered through non-concessional loans rather than grants, increasing debt burdens despite these countries contributing least to global emissions. Several OECD members-including France, Germany and Denmark-now mandate 20-25 per cent of their climate budgets for adaptation, signalling an effort to correct this imbalance.

New instruments such as insurance-linked securities (ILS), climate-risk pools (e.g., the African Risk Capacity and the Caribbean Catastrophe Risk Insurance Facility), micro-insurance schemes and resilience bonds are expanding to help low-income and climate-vulnerable countries manage losses and damages. The Generali Group (2025) calls for the financial sector to treat adaptation as a distinct long-term investment class-on par with ESG-emphasising that resilience bonds, micro-insurance and climate-risk financing solutions are critical for safeguarding assets, livelihoods and fiscal stability.

Trend Towards Inclusive Finance and Equitable Adaptation

CPI (2025) and OECD (2024) experts observe a shift from “mitigation-centric” to “adaptation- and equity-focused” climate finance. Countries are establishing legal frameworks to incentivise adaptation finance through public-private co-financing, climate-risk funds, or

disaster insurance. However, a cautious note is warranted: the global adaptation-financing gap is so substantial that it is unlikely to be fully bridged. This makes it essential to clarify how the public and private sectors can each contribute to expanding adaptation finance, even if they cannot close the gap entirely.

On the private side, investment tends to flow toward activities that offer measurable returns-such as climate-proofing physical assets, resilient infrastructure for industrial operations, or financial products linked to risk reduction. These investments can reduce long-term losses and improve firms' creditworthiness, thereby strengthening the economic case for private-sector engagement.

On the public side, governments play an indispensable role in financing critical infrastructure and public goods that do not generate commercial returns-such as coastal defences, flood-management systems, climate-resilient agriculture, and early-warning systems. Public finance also acts as a catalyst, crowding in private investment through guarantees, concessional lending windows and risk-sharing mechanisms.

Together, these approaches help rebalance mitigation and adaptation, ease fiscal pressures, mobilise additional capital, and enhance resilience for climate-vulnerable communities-even though the full adaptation gap cannot be eliminated.

1.4.2 Public Green Finance

Green Budgeting

National budgets remain the largest public-finance source, accounting for ~80 % of global public climate capital. CPI (2025) estimates that every USD 1 of budgetary "seed" capital leverages an average USD 7 from private sources, underscoring the public sector's catalytic role. Global public climate finance reached USD 684 billion in 2023 (36 % of total USD 1.9 trillion), down 13 % from 2022 due to post-pandemic fiscal constraints. The 2021-2023 average was USD 650 billion annually, up 26 % from USD 500 billion (2018-2020), driven by public investment in renewables and adaptation infrastructure, particularly in China and advanced economies. East Asia & Pacific accounted for over 46 % of budgetary climate flows (USD 312 billion in 2023). The shift from recurrent clean-energy subsidies to capital investment in climate-resilient infrastructure (coastal defences, urban drainage, sustainable water management) is pronounced.

Budgetary Structure: Strong Mitigation Bias, Limited Adaptation

Global budgetary allocations in 2023 reveal a stark imbalance: 93.3 % for mitigation, 5.8 % for adaptation. Within mitigation, clean energy absorbed 60 % (USD 412 billion), clean transport 20 % (USD 138 billion), and AFOLU/waste 6 % (USD 38 billion). China led with USD 298 billion in mitigation budgets (44 % globally). Adaptation budgets totalled USD 46 billion, focused on water management and disaster-resilient infrastructure, with sub-Saharan Africa and Latin

America as primary recipients. Adaptation budgets rose modestly from USD 35 billion (2018-2020) to USD 43 billion annually (2021-2023), reflecting growing risk awareness.

Green budgeting is a central tool for ensuring that public expenditure is aligned with national climate objectives. Aligning public spending with climate goals and strategies represents a core capability of public institutions in responding to climate change. The budget serves as the primary mechanism through which governments set expenditure priorities and ensure that public spending is consistent with policy commitments. The budgeting process is therefore critical not only for directing resources towards climate action but also for evaluating the effectiveness of public spending on climate-related interventions.

The overarching purpose of green budgeting is to ensure that public expenditure is allocated in ways that support climate goals, incorporate fiscal risks arising from climate change, strengthen transparency and financial accountability, and encourage both public and private investment in sustainable activities. According to the OECD (2025), five main categories of green budgeting instruments are widely used:

(1) **Green budget tagging:** This is the foundational tool of green budgeting. It enables governments to classify and track spending according to its environmental impact. Expenditures can be categorised as:

- *Green spending*: activities that contribute positively to mitigation, adaptation, or environmental protection;
- *Neutral spending*: activities with no significant environmental impact;
- *Brown spending*: activities that harm or impede environmental objectives.

Green tagging is not merely a technical exercise; it is a policy tool that helps governments reassess and realign public resource allocation.

(2) **Climate budget impact assessment.**
This advanced tool quantifies the expected climate impact of each budget item, particularly its effect on greenhouse gas emissions or its contribution to specific targets under the Nationally Determined Contributions. It allows policymakers to assess how spending decisions support or hinder national climate commitments.

(3) **Climate-related fiscal risk analysis.**
Climate risks can threaten fiscal sustainability by increasing disaster-response expenditures, reducing revenue due to energy transitions, or raising public debt through large-scale adaptation investments. Fiscal risk assessment tools allow governments to: i) estimate long-term budgetary costs arising from climate change; and ii) integrate climate risks into fiscal sustainability assessments and medium-term public investment plans.

(4) **Climate cost-benefit analysis**
These tools quantify the economic costs, social benefits and emissions impacts of

budget policies or public investment projects. They help determine whether public spending delivers value for money while supporting climate objectives.

(5) **Green budget reporting**

The aim is to increase transparency and enable parliaments and the public to evaluate the climate alignment of public spending. OECD recommends that governments publish annual green budget reports summarising climate-related expenditures, revenues and fiscal policies. Such reporting strengthens accountability and embeds climate considerations in fiscal governance.

Table 5: Green-budgeting tools

Tool Group	Primary Objective	OECD Country Examples
Green budget tagging	Identify green and brown spending	France, Ireland, Mexico
Emissions-impact assessment	Measure GHG savings per budget line	South Korea, Denmark
Climate fiscal-risk analysis	Quantify long-term climate-related fiscal costs	New Zealand, Finland
Climate cost-benefit analysis	Compare economic and environmental returns	Denmark, France
Green-budget reporting	Enhance transparency and accountability	France, Ireland, Austria

Source: OECD (2025)

Integrating climate considerations into national budgeting has become a mandatory requirement, given that public expenditure accounts for nearly half of GDP across OECD countries. On average, public spending represents approximately 43.3 per cent of GDP in the OECD. Since 2017, the OECD has developed the Paris Collaborative on Green Budgeting to guide countries in applying green budgeting instruments appropriate to their institutional capacity and resource conditions. By 2025, this initiative is being expanded through the Green Budgeting Toolkit and Good Practices in Green Budgeting, which provide benchmark criteria enabling countries to self-assess the degree of "greenness" within their fiscal governance systems. Importantly, there is no single model for green budgeting; countries typically combine a range of instruments to create a multi-layered green budgeting framework.

OECD countries have made significant progress in adopting green budgeting practices. As of 2022, 24 out of 36 OECD members (66 per cent) had implemented at least one green budgeting tool, compared with only 14 countries in 2020 (OECD, 2024). They have also strengthened the institutional arrangements underpinning green budgeting and expanded the range of methods and tools in use. Countries such as France, South Korea and Denmark have developed advanced instruments including green budget tagging and greenhouse-gas-informed budgeting systems that assess the emissions impacts of individual budget lines. Key examples include:

- **Green budget tagging:** France is widely regarded as the pioneer of modern green budget tagging, introducing its system in 2020 with a three-tier classification that assesses each expenditure line as “favourable,” “neutral,” or “harmful” to the environment. The tagging results are applied to the entire annual budget proposal and published alongside the Budget Law, creating full transparency on the environmental profile of public spending. Since then, many countries have adopted similar approaches. While green tagging is highly useful for identifying whether public resources are being directed towards green or environmentally harmful activities, it is less effective for prioritising between competing policy proposals because it does not quantify the impact of each expenditure item. To address this, several countries, such as Ireland, Mexico, Indonesia and Sweden use comparable environmental budget-classification models that assign spending to categories (e.g., climate-positive, climate-neutral, climate-negative) and compute the share of the national budget aligned with environmental goals) enabling governments to determine the share of public expenditure that supports or undermines environmental goals. South Korea operates a comprehensive “Green Budget Tagging” system across the full budget cycle. South Korea operates one of the most comprehensive green-budget tagging systems in the world, applying it across the entire budget cycle, from formulation to execution and reporting. According to the OECD Green Budgeting Review (2024), South Korea is the only Asian country currently rated as having “advanced integration” of green budgeting. In 2023, approximately 16.2 per cent of central-government expenditure—equivalent to USD 28 billion—was classified as climate- and energy-related spending. This represents a significant step toward improving coherence between public budgets, public credit policies and public investment in support of the green transition.
- **Climate budget impact assessment:** South Korea has implemented the Greenhouse Gas Reduction Cognitive Budgeting System (GHG-RCBS) since 2023. This tool analyses the projected emissions reductions associated with each expenditure item, integrates the results into budget preparation and approval, and assesses ex-post whether the budget has achieved its emissions objectives. Denmark applies the GreenREFORM model, an integrated economic-climate simulation system, to evaluate the impact of green tax proposals and public spending on emissions outside the energy sector, particularly in agriculture and forestry.
- **Climate-related fiscal risk analysis**: The OECD has developed the Climate Fiscal Risk Assessment Tool, which helps countries estimate the potential fiscal costs of climate change and the long-term budgetary consequences of inaction. New Zealand and Finland now incorporate climate-reted fiscal risks into their national fiscal sustainability reports.
- **Climate cost-benefit analysis:** Denmark uses the GreenREFORM model to calculate social and fiscal costs of individual green tax reforms. France is developing a life-cycle environmental cost assessment system to evaluate the full environmental footprint of public investment projects.

- Green budget reporting: France and Ireland publish dedicated green budget reports alongside the annual national budget. Austria integrates green budgeting into its "SDG Expenditure Report", increasing transparency on both environmentally beneficial and detrimental spending.

Green budgeting is one of the most powerful mechanisms for institutionalising climate commitments within the public sector. However, significant challenges remain in implementation. Key barriers include:

- insufficient resources to develop and maintain robust green budgeting methodologies;
- limited technical knowledge or expertise on how to integrate climate and environmental considerations into budgeting processes;
- gaps in data on climate impacts and environmental sustainability, which are required for evidence-based reporting and fiscal decision-making.

These challenges underscore the need for continued capacity-building, improved data systems and strong institutional coordination to ensure that green budgeting becomes a fully operational and effective component of public financial management.

Green Public Procurement

Green public procurement (GPP) is a critical institutional lever for stimulating green markets. Public infrastructure projects, which account for a substantial share of national budgets, must be selected and assessed not only on financial efficiency but also on their contribution to emissions reduction and climate resilience. The OECD estimates that the world will require approximately EUR 6.7 trillion in infrastructure investment every year to 2030 to remain on track with the Paris Agreement. This level of investment will only be feasible if public investment is strategically aligned with climate objectives.

Within public procurement, representing around 13 per cent of GDP on average across OECD countries, the introduction of green criteria, life-cycle cost assessments and mechanisms for early dialogue with suppliers enables governments to reduce emissions while encouraging technological innovation. Countries such as Italy and Canada have made green procurement mandatory, supported by regular monitoring frameworks and transparent public reporting.

Across the OECD, green public procurement frameworks are now the norm. According to OECD (2025), by the end of 2022, 92 per cent of OECD members and candidate countries had adopted or implemented national GPP frameworks. This means that almost the entire public governance system within the OECD has integrated environmental standards into procurement processes, from vendor selection and technical specifications to full life-cycle product evaluation. Because public procurement accounts for an average of 13 per cent of GDP in OECD countries, greening this domain allows governments to leverage public purchasing power to: drive innovation in green technologies; reduce emissions across supply

chains; and encourage private-sector investment in environmentally sustainable goods, services and technologies

International experience with green public procurement

- Italy is among the most advanced OECD members with respect to mandatory GPP legislation. Since 2017, Italy has required all public authorities, including national and sub-national, to apply mandatory Minimum Environmental Criteria (CAM) across 18 product and service categories, including construction, energy, ICT equipment, transport, food services and public sanitation. CAM must be applied to all public tenders, irrespective of contract value. Italy's model is now regarded as one of the strongest legal frameworks for compulsory green procurement within the OECD.
- France integrates GPP into its National Strategy for Ecological and Climate Transition using two complementary tools: Green Budget Tagging - to identify budget allocations for green procurement and Guide for Sustainable Procurement (2021), providing detailed guidance on embedding carbon criteria, life-cycle assessment and recycled packaging requirements into tender design. France has set a binding target: *by 2025, 100 per cent of central-government procurement contracts must include environmental criteria*.
- Denmark has one of Europe's most comprehensive GPP systems. The "Green Procurement for a Green Transition" strategy (2020) requires: life-cycle emissions assessment for all public contracts above EUR 50,000; and establishment of a national database on the environmental impacts of product groups Denmark also uses the GreenREFORM model to analyse emissions impacts in public investment and procurement.
- Canada is a central member of the Greening Government Initiative (GGI). Under Canada's 2017 Green Procurement Policy, all federal entities must: apply carbon, energy-efficiency and recycling criteria in every procurement contract and report annually on the share of contracts containing green requirements Canada also delivers mandatory GPP training for civil servants, thereby strengthening administrative capacity.
- Germany mandates green procurement at the federal level. Through the Sustainable Administration Act (2022), Germany requires federal institutions to prioritise energy-efficient, recycled and low-carbon products. The Federal Environment Agency (UBA) publishes detailed GPP guidance covering 20 product groups, with mandatory criteria for energy performance, recycled materials and carbon certification.
- Japan is the first Asian OECD member to legislate green procurement. Japan's Green Purchasing Law (2001) mandates: all central government bodies must purchase products meeting environmental standards set by the Ministry of the Environment; and annual public reporting on the share of green products in procurement. This

legislation has created a strong domestic market for green products, particularly in energy and electronics.

Despite strong progress, effective implementation requires deeper engagement with suppliers and better forward planning of procurement pipelines. In practice, many countries still face challenges related to supplier collaboration and signalling future green investment opportunities. OECD data show that 50 per cent of OECD members and accession countries do not publicly disclose future GPP opportunities in their procurement pipelines. This gap in communication and market preparation limits the ability of the private sector to invest proactively and respond to future green procurement needs. **To close this gap, countries need enhanced guidance, structured early-market engagement and multi-stakeholder platforms that support systematic dialogue between governments, suppliers and industry.** Such mechanisms are essential to ensure that GPP frameworks operate effectively, build competitive green markets and deliver measurable climate results.

Green Taxation

Carbon Taxes Continue to Expand in Scale and Scope

Numerous countries, including lower- and middle-income economies (LMICs), are considering or implementing carbon taxes as an essential component of emission-reduction strategies. The UNDP reports that by 2024, 39 economies had adopted carbon taxes, including Argentina, Colombia, Chile, Mexico, South Africa, and Uruguay; Singapore was the first major Southeast Asian nation to introduce one in 2019.

Carbon taxes are applied not only in developed economies but are spreading to developing ones, primarily through two models: upstream (at fuel-supply level - e.g., Sweden, Finland, Switzerland, Mexico, Colombia) and downstream (at emission source - e.g., Singapore, Chile, South Africa).

A notable trend is the integration of digital technology, big data, and MRV platforms to enhance carbon-tax administration. The UNDP highlights tools such as data-management systems (DMS), IoT, blockchain, and credit-trading platforms to increase transparency and efficiency. Carbon taxes are increasingly linked to carbon-market mechanisms - for instance, allowing offsets within tax frameworks or aligning rates with the EU's Carbon Border Adjustment Mechanism (CBAM). As of November 2025, Singapore has raised its carbon tax to SGD 25/tCO_2 and announced a phased increase to SGD 80 by 2030, with full revenue recycling into green R&D and household rebates.

Carbon Border Adjustment Mechanism (CBAM)

Amid global efforts to curb climate change, the European Union has implemented the Carbon Border Adjustment Mechanism (CBAM) to prevent carbon leakage and promote green production. CBAM is a tax on imported goods, ensuring that products entering the EU face the same carbon costs as EU-produced goods under stringent emissions regulations.

CBAM's primary objectives:

- Prevent carbon leakage by taxing high-emission imports, creating a level playing field for EU producers.

- Drive global emission reductions by incentivising non-EU countries to adopt sustainable production standards.

- Support the EU's 55 % reduction target by 2030 (vs 1990 levels). The EU adopted a new 2040 target of -90 % in October 2025, with CBAM revenues earmarked for the Just Transition Fund.

CBAM initially targets high-emission, leakage-prone sectors: cement, iron and steel, aluminium, fertilisers, electricity, and hydrogen. From 2023-2025, CBAM operates in reporting-only mode; full financial obligations begin in 2026.

Mechanism: EU importers register with national authorities, purchase CBAM certificates priced at the weekly EU ETS allowance average, declare embedded emissions, and surrender certificates annually. Importers proving carbon costs already paid at origin receive deductions to avoid double taxation. Goods are classified as simple or complex (the latter requiring upstream-emission reporting). Certificate prices ranged EUR 60-90/tCO_2 in 2023. CBAM is a cornerstone of EU climate policy, encouraging trading partners to decarbonise production.

Green Taxation Shifts from Single Measures to Comprehensive Packages

- **Integrated green-tax policy design:** Countries are moving from isolated carbon taxes to comprehensive green-tax systems encompassing fossil-fuel taxes, pollution-product levies, resource taxes, and reform of traditional subsidies. This ensures tax systems consistently support carbon-neutrality. Subsidy phase-out remains slow, necessitating bolder reforms for policy coherence. Japan is the only G7 nation to fully integrate GX policy into long-term fiscal strategy, using carbon-tax revenues to back GX bonds while maintaining debt sustainability (IMF Fiscal Monitor, 2024).

- **Sector-specific taxes for high-emission industries:** Aviation, maritime, and international trade face increasing fuel or carbon taxes. The EU's CBAM compels trading partners to establish domestic carbon pricing or pay import levies.

- **Green taxes paired with incentives:** "Polluter-pays, innovator-gains" frameworks combine emission penalties with tax credits, accelerated depreciation, and exemptions for renewables, EVs, and green retrofits.

- **Tax reform aligned with broader green policies:** Import-duty reductions on energy-efficient equipment and clean-tech components lower green-product costs, accelerate domestic market growth, and speed emission reductions. However, reforms require

fiscal-impact analysis and domestic-production capacity. In developing Asia and Africa, average tariffs on green goods remain 2.5-7.1 %, compared with 1.88 % in developed economies (UNCTAD, 2024c). Regional integration and South-South cooperation offer significant scope for tariff harmonisation. Targeted subsidies and green public procurement complement tax cuts, provided they comply with WTO non-discrimination rules.

Strengthening Linkages Between Green Taxation and Just Transition

Countries facing social backlash against environmental or carbon taxes increasingly prioritise fairness in cost distribution. Carbon taxes can impose additional production costs on firms—particularly in energy-intensive sectors—reducing competitiveness if trading partners do not adopt similar measures. For consumers, higher carbon prices often translate into increased electricity, transport and goods prices, disproportionately affecting low-income households. These distributional impacts highlight the need for carefully designed offsetting strategies.

Effective, durable carbon taxes therefore require strong social support, transparent revenue use and clear communication about long-term benefits. International experience shows that governments typically adopt a suite of mitigation measures to reduce burdens on businesses and households. For enterprises, these include transitional rebates, targeted tax credits for energy-efficiency upgrades, accelerated depreciation for green technologies, and multi-year certainty in tax trajectories to support investment planning. For households, common compensatory measures include direct cash transfers, energy-bill rebates, reduced payroll taxes, or targeted exemptions for vulnerable groups.

Implementation frequently begins with low tax rates followed by gradual, predictable increases to allow firms and consumers to adjust. Singapore's carbon tax illustrates this approach: it started at SGD 5/tCO_2, with a roadmap to SGD 25/tCO_2 in 2024 and SGD 50-80/tCO_2 by 2030, accompanied by incentives for industrial decarbonisation and support for low-income households.

Well-designed compensation mechanisms ensure that carbon taxes remain both economically efficient and socially acceptable, while preserving incentives for long-term emissions reduction.

In 2024, approximately 56 % of carbon-pricing revenues were allocated to climate, environmental, or development goals; 19 % were returned to affected households or firms (direct transfers or tax relief) (I4CE, 2025). This enhances social acceptability and long-term policy sustainability.

Key Challenges in Green-Tax Reform

Despite global momentum, challenges persist: low carbon prices, competitiveness concerns, inflationary pressures, and resistance from low-income groups. Coordinating sector-specific

rates, addressing carbon leakage, and managing CBAM impacts on developing countries demand stronger international cooperation.

Debt Financing

Bilateral ODA Remains Vital but Limited Relative to Needs and Rising Global Climate Debt

Bilateral ODA continues to be a critical public resource for developing and emerging economies, especially amid mounting public-debt and climate-debt pressures. From 2018-2020, bilateral climate ODA averaged USD 35 billion annually, growing ~8 % per year; in 2021-2023, it rose to USD 46 billion, a 26 % increase. Despite rapid growth, OECD (2024) notes ODA represents only a small fraction of total climate finance and falls far short of the USD 100 billion annual pledge made by developed countries in 2009. This widening finance gap contributes to a growing "climate debt" between developed nations and vulnerable countries.

Allocation remains heavily mitigation-focused (88 %). Clean energy absorbs 60 % (USD 27 billion), clean transport 20 % (USD 9 billion), and AFOLU/waste ~6 % (USD 3 billion). Germany leads with USD 12.4 billion in 2023, followed by Japan, France, and the United States. Adaptation ODA is ~12 % (USD 6 billion), targeting water management, disaster-resilient infrastructure, and drought-flood response in sub-Saharan Africa and Latin America. Adaptation ODA rose from USD 4 billion to USD 6 billion annually, yet remains below 10 % of global adaptation needs (UNFCCC), projected at USD 215-387 billion yearly by 2030.

MDB Lending and Grants Surge, Catalysing Climate Investment but Adding Debt Pressure in Developing Countries

Capital from 27 MDBs has become a cornerstone of international climate finance, de-risking investments for emerging markets. From 2018-2020, MDBs mobilised USD 30 billion annually; in 2021-2023, this tripled to USD 91 billion, with 26 % annual growth. In 2023, MDB climate finance reached USD 91 billion, down 9 % from 2022 due to global inflation and borrowing-cost spikes.

89 % of MDB capital targets mitigation: clean energy (60 %, ~USD 55 billion), clean transport (20 %, ~USD 18 billion), AFOLU/waste (6 %, ~USD 5 billion). The World Bank leads with USD 31.2 billion in mitigation finance in 2023. Adaptation finance is 11 % (USD 10 billion), focused on water, resilient infrastructure, and early-warning systems in Africa and Latin America. Adaptation MDB finance tripled from USD 3 billion to USD 10 billion annually, reflecting expanded multilateral roles in global climate-risk response.

However, IMF (2024) and CPI (2025) warn that most MDB climate finance is delivered as loans, exacerbating debt burdens in developing countries. Over 60 % of low-income countries are in debt distress or at high risk. This underscores the urgent need for debt restructuring, expanded grant financing, and innovative instruments such as debt-for-climate swaps, climate-risk insurance, and ultra-long-term concessional credit.

Climate Funds

Energy-transition funds are designed to mobilise, de-risk, and support investments in emission-reduction and clean-energy innovation (IEA, 2024). Funding sources include national budgets, carbon revenues, ODA, or MDBs (IMF, 2024).

EU Innovation Fund

The **EU Innovation Fund** is one of the European Union's largest dedicated climate-finance programmes, created to support highly emissions-reducing technologies and green innovation in energy-intensive industries and large-scale infrastructure. It is among the largest funding programmes in the world for the **commercial deployment** of innovative, near zero-emission and net zero technologies.

The Fund's objectives and operating principles are geared towards delivering market-based solutions for industrial decarbonisation in Europe, supporting the transition to climate neutrality while strengthening competitiveness. It is a key financing tool for implementing the EU's economy-wide commitments under the Paris Agreement and for advancing climate and energy priorities set out in **the REPowerEU Plan, the European Hydrogen Bank, the Green Deal Industrial Plan and the Net-Zero Industry Act.**

Unlike traditional grant schemes that focus primarily on research and development, the Innovation Fund targets **first-of-a-kind** flagship projects and breakthrough emissions-cutting technologies such as green hydrogen, carbon capture utilisation and storage, advanced renewable energy, sustainable fuels and low-carbon industrial processes. Supported projects typically have long lifetimes and represent the first industrial deployment of technologies at commercial or near-commercial scale, that is technologies used for the first time at large scale or not yet available on the market. The overarching aim is to help companies invest in clean technologies and low-emission industrial activities, while fostering economic growth, generating green jobs and consolidating the EU's technological leadership globally.

The Fund is financed through revenues from the EU Emissions Trading System (EU ETS): proceeds from auctioning emission allowances are recycled into the Fund rather than flowing into the general budget. **This links the "polluter pays" principle directly to climate innovation, as higher carbon prices increase the resources available for low-carbon investment.** The Fund is administered by EU bodies such as the European Climate, Infrastructure and Environment Executive Agency (CINEA) and operates in close co-operation with the European Investment Bank (EIB), which provides technical assistance, project development support and in some cases complementary financing.

Germany's Climate and Transformation Fund (KTF)

Germany has established the Climate and Transformation Fund (Klima- und Transformationsfonds, KTF) to finance programmes for electrification and green industrial transformation over the period 2023-2026. The Federal Government has earmarked approximately EUR 177.5 billion for this fund for 2023-2026, with the objective of ensuring that energy supply becomes environmentally friendly, reliable and affordable.

KTF resources are allocated to several key priority areas, including:

- support for the renovation and upgrading of housing and buildings in the construction sector (Federal Funding for the Building Sector)
- development of infrastructure for electric vehicles and charging networks (electric mobility and charging infrastructure)
- expansion of the green hydrogen industry
- promotion of energy efficiency across different sectors

Support for households and enterprises affected by higher energy costs is also an important component. Since 1 July 2022 the surcharge under the Renewable Energy Sources Act (EEG-Levy) has been abolished for electricity consumers, with compensation financed from the KTF.

The Fund is financed mainly from domestic carbon pricing revenues and the national emissions trading scheme, together with associated reserves. It is designed to be largely "self-financing" over the medium term, relying on its own revenue streams and reserves in 2023 without additional transfers from the federal core budget.

These public funds illustrate the role of the public sector in providing "anchor capital" and de-risking for private investment, thereby catalysing public-private partnerships (PPPs) and blended-finance models and helping to build multi-layered green investment chains across the economy.

1.4.3 Private sources of finance

Private finance is becoming the main driving force behind global climate investment

Private finance is increasingly a central pillar of the climate-finance system, particularly on the mitigation side. In 2023 private capital accounted for around two-thirds of total global mitigation investment, signalling a strong shift from a predominantly public-budget-driven model towards one led by markets and private financial actors. According to CPI (2025), in the period 2018-2023 the public and private sectors together mobilised a cumulative USD 6.9 trillion in climate finance, with the private sector showing the more dynamic growth pattern.

The growth rate of private climate finance far outpaces that of the public sector. Between 2018 and 2023 private climate finance recorded a compound annual growth rate (CAGR) of 30 per cent, compared with 18 per cent for public finance. In the single period 2022-2023 private

climate finance rose by around 44 per cent, reflecting more favourable investment conditions as supply-chain pressures eased and the prices of clean-energy equipment fell (IEA, 2024). In 2023 forty-three private institutions each invested more than USD 1 billion, together contributing USD 86 billion, almost three times the USD 30 billion recorded in 2022. This underlines the rapid expansion of large-scale private investors in the climate space.

China is a notable example of the leading role of the private sector in the energy transition. It is now the largest private market for mitigation investment, with a volume of USD 374 billion in 2023, representing 58 per cent of total national mitigation finance and a 325 per cent increase compared with 2018. This capital has driven system-level transformation in energy, especially in battery manufacturing, electric vehicles, solar photovoltaics and energy storage. The growth reflects strong domestic capital mobilisation and a consistent policy framework that has created favourable conditions for private investment.

In Japan, the Ministry of Economy, Trade and Industry (METI, 2023) has issued guidance on "roadmap-based finance", a mechanism whereby financing is linked to companies' decarbonisation trajectories and milestones, helping to reduce the risk of misalignment between stated commitments and real-world action. ICMA and the NGFS (2024) regard this as one of the most practical and credible approaches for industrialised economies.

Cross-border private climate finance flows are rising, with a growing focus on emerging markets and developing economies

Cross-border private capital flows to emerging markets and developing economies (EMDEs) reached USD 42 billion in 2023, mainly from commercial banks, financial institutions and multinational corporations (USD 36 billion). The regions attracting the largest volumes include Latin America and the Caribbean, the Middle East and North Africa and Central and Eastern Europe, driven by demand for investment in renewable energy, green hydrogen and clean technologies. A prominent example is the NEOM Green Hydrogen project in Saudi Arabia with a total investment of USD 8.4 billion, supported by more than 20 domestic and international investors. This demonstrates the scale at which private finance is now engaging in next-generation clean-technology projects.

Private finance is expanding but remains skewed towards mitigation rather than adaptation

In 2018-2020 private finance for mitigation accounted for around 45 per cent of total private climate flows, while adaptation captured 34 per cent. In 2021-2023 these shares rose to 54 per cent for mitigation and 43 per cent for adaptation, indicating some broadening of private investment into climate-risk-exposed sectors. Nonetheless, private finance is still heavily biased towards mitigation, as adaptation projects such as water resource management, climate-resilient agriculture or health systems tend to have less clearly monetisable benefits, long payback periods and higher risk profiles. Country risk, the absence of robust disclosure standards and limited risk-sharing mechanisms further constrain private participation in adaptation.

Households are emerging as the largest single source of private climate capital, particularly for mitigation

According to CPI (2025), during 2018-2020 households mobilised an average of around USD 220 billion per year, with modest growth of about 8 per cent annually as the pandemic squeezed personal spending. In 2021-2023 this flow rebounded strongly alongside global economic recovery, sharp falls in the cost of clean-energy equipment and the rapid uptake of consumer-facing green technologies (IEA, 2024). Households accounted for 50 per cent of the USD 380 billion increase in overall private finance, with household investment alone rising by 66 per cent between 2022 and 2023.

In 2023 households provided USD 412 billion, a 60 per cent increase from 2022 and the fastest growth among all private investor groups. Around 93 per cent of this funding went to mitigation, concentrating on clean energy such as rooftop solar, electric vehicles and home battery storage. China stands out: in 2023 it added 1.4 million new rooftop solar systems, driving very large-scale household investment in emissions reduction (IEA Solar PV Report 2024).

By contrast, household finance for adaptation is still modest, representing only 7 per cent of private climate capital, or USD 29 billion in 2023. These flows are mainly directed towards water management, strengthening the resilience of housing and small-scale adaptation equipment. Western Europe leads household adaptation investment, including sustainable urban mobility infrastructure and green consumer technologies that indirectly support adaptation, for example electric vehicles that contribute to reduced air pollution and more sustainable cities.

Commercial enterprises remain central to the mobilisation of private climate finance, especially through cross-border investment

CPI (2025) reports that cross-border private climate finance into EMDEs amounted to USD 42 billion in 2023, of which USD 36 billion came from commercial banks, financial institutions and multinational corporations. International private capital markets, particularly in Latin America and the Caribbean and the Middle East and North Africa, are key destinations for these flows.

On the mitigation side, companies are increasing investment in renewable energy, sustainable agriculture, carbon credits and forest restoration to reduce supply-chain emissions and meet ESG compliance requirements. Major energy and heavy-industry groups such as China's CGN Wind and Germany's RWE AG are expanding their clean-energy portfolios. In 2023 there was also a sharp rise in investment from large transport corporations, each investing more than USD 1 billion, reflecting growing pressure on the global transport sector to decarbonise.

Flagship projects further illustrate this trend. The NEOM green hydrogen project in Saudi Arabia, with an investment volume of USD 8.4 billion, backed by more than 20 regional and international investors, shows how companies are shifting into new-generation green

technologies that are expected to create entirely new markets over the coming decade (BloombergNEF, 2024).

However, as with households, commercial firms remain much more active in mitigation than in adaptation. Adaptation projects in areas such as water management, resilience infrastructure and climate-related health services often lack clear revenue streams and adequate risk-sharing instruments. Country risk, regulatory gaps and high financing costs in many EMDEs continue to deter private investment in adaptation.

Commercial financial institutions now provide the largest share of private climate finance in absolute terms

According to CPI (2025), between 2018 and 2020 commercial financial institutions mobilised an average of USD 340 billion per year, with moderate growth of around 8 per cent annually due to the pandemic-related downturn in credit and investment flows. In 2021-2023 the volume surged to USD 620 billion per year, with growth of 26 per cent annually, driven by the recovery of green capital markets and the rapid expansion of sustainable bond portfolios in advanced economies.

In 2023 commercial financial institutions raised USD 834 billion through the issuance of green and sustainable bonds and a further USD 228 billion via project lending for climate-related activities. This reflects the strong rebound of bond markets after the pandemic and high demand for large-scale clean-energy investment, particularly in Europe, North America and East Asia (BloombergNEF, 2024).

These institutions direct the majority of their climate capital towards mitigation, which accounted for 91 per cent of global flows in 2023. Most funding is channelled into clean energy, especially via green bonds. Europe leads mitigation investment by commercial financial institutions in both observed periods, consistent with the EU's strong commitment to delivering the European Green Deal. In 2023 Bank of America headed global financial institutions, mobilising USD 48 billion for climate-related investment, followed by major EU banks such as Crédit Agricole, BNP Paribas and Deutsche Bank. In Korea the Korea Green New Deal Fund, co-founded by the Korea Development Bank (KDB) and the National Pension Service (NPS), has a size of USD 12 billion and aims to share risk and crowd in private capital for green projects. Priority is given to loans and guarantees for emission-reduction, energy-efficiency and hydrogen-technology investments.

The mitigation focus of commercial financial institutions mirrors OECD and IEA data showing that private capital continues to concentrate in renewables, electric vehicles, energy storage, green hydrogen and net-zero projects that offer relatively stable returns and predictable cash flows.

Commercial-finance support for adaptation, while growing, remains limited at 9 per cent of total climate lending in 2023, equivalent to USD 36 billion. These funds largely support water management, infrastructure protection, climate-resilient housing and early-warning systems.

Central Asia and Eastern Europe are the main recipients, with around USD 40 billion in adaptation finance across the two periods, reflecting heightened climate risks in semi-arid regions and areas with ageing infrastructure. IMF (2024) notes that adaptation lending is held back by high country risk, the absence of robust models to quantify financial returns and long payback periods, all of which make banks and funds reluctant compared with mitigation projects where revenue streams are clearer.

Institutional investors - pension funds, insurers, investment funds, sovereign wealth funds and asset managers - are becoming a crucial source of long-term capital for global climate finance

CPI (2025) indicates that in 2018-2020 institutional investors mobilised an average of USD 120 billion per year, with modest annual growth of 8 per cent due to financial market volatility and restrictions on long-term investment during the COVID-19 period. In 2021-2023 the volume increased significantly to USD 200 billion per year, with growth of 26 per cent, supported by the rapid expansion of green bond markets, sustainable equities and dedicated climate-thematic funds. According to BloombergNEF (2024), total assets under management in ESG and climate funds have surpassed USD 6.2 trillion, providing a sizeable pool of capital for long-term investment in renewables, smart grids and energy-storage technologies.

In 2023 institutional investors raised USD 834 billion through green and sustainable bonds, the highest level on record, underlining their central role in the climate-finance ecosystem. As with other private investors, 91 per cent of their capital in 2023 went to mitigation. Clean energy attracted the largest share via green bonds, renewable-energy equities and thematic funds. Europe is the leading market, accounting for 47 per cent of global green bond issuance in 2023, underpinned by strong sustainability regulation (EU Taxonomy, SFDR) and deep capital markets. Many European pension funds have adopted net-zero portfolio targets, driving substantial flows into emission-reducing sectors. OECD (2024) confirms that pension funds and insurers are expanding green allocations to manage long-term risk and comply with mandatory sustainability standards.

Investment in adaptation remains low but is gradually increasing, concentrated in highly vulnerable regions. Institutional-investor adaptation finance accounts for just 9 per cent of their climate allocation, around USD 36 billion in 2023, mainly directed to water management projects, infrastructure protection and disaster-resilient construction. In Latin America and the Caribbean infrastructure funds and catastrophe-insurance vehicles have expanded their portfolios, providing roughly USD 40 billion across the two periods, reflecting pressing needs in regions frequently exposed to storms, droughts and sea-level rise. Nevertheless, IMF (2024) notes that institutional capital for adaptation remains constrained by difficulties in quantifying returns and the limited availability of risk-mitigation tools such as climate credit guarantees and risk-sharing facilities.

1.4.4 Green financial markets

Green financial markets have expanded rapidly but show signs of deceleration

Markets for green financial instruments have reached record scale. The total value of financial products labelled “green” or “sustainable” exceeded USD 8.2 trillion in 2024, an increase of about 17 per cent from the previous year (UNCTAD, 2025).

Bloomberg Intelligence (2024)[4] reports that global green bond issuance reached around USD 575 billion in 2023, reflecting sustained demand for financing energy transition, green infrastructure and technological innovation, despite a high interest-rate environment. According to the Climate Bonds Initiative (2025)[5], issuance of GSS+ instruments (green, social, sustainability and sustainability-linked bonds) continued to grow strongly in 2024, reaching USD 1.05 trillion of aligned issuance and raising the cumulative global total to about USD 5.7 trillion, up from USD 4.7 trillion at the end of 2023. Green bonds alone account for roughly 64 per cent of GSS+ issuance. However, recent reports indicate that in 2025 global green bond issuance has declined, falling by close to 32 per cent year-on-year due to policy uncertainty and tighter market conditions (Reuters, 2025).

Even so, green bonds and sustainable debt instruments have become a core funding channel for the global green transition, providing countries with long-term capital and establishing new transparency benchmarks for environmental and social risk management in international finance. Europe accounts for more than half of total issuance, with the Asia-Pacific region contributing about 25 per cent, led by China, Japan, Korea and Singapore.

Expanding green instruments to EMDEs and through cross-border flows

ASEAN[6] reports show that green finance has “attracted global capital, with green bonds, carbon markets and sustainable funds expanding rapidly” in Southeast Asia. In China and other major emerging economies the issuance of green, transition and offshore instruments such as green panda bonds is increasing. Green financial instruments are therefore no longer confined to advanced economies but are spreading into emerging markets with rising levels of cross-border collaboration.

Persistent challenges in green finance markets

Despite strong growth, significant challenges remain. While issuance of green bonds and sustainable funds has increased, 2025 has seen a decline in volumes due to uncertain policy environments and higher capital costs. Adaptation finance continues to receive far less funding than mitigation because financial benefits are harder to quantify, capital costs are higher and project risks are greater. Large investors are concerned about the scale of returns and long payback periods associated with adaptation instruments. In addition, underdeveloped green-credit markets in EMDEs, data gaps and country risk are substantial obstacles.

[4] Bloomberg Intelligence (2024). Green Bonds Reached New Heights in 2023

[5] Climate Bonds Initiative (2025). Sustainable Debt Global State of the Market 2024 (14th edition)

[6] https://www.csis.or.id/publication/green-finance-landscape-in-asean-trends-challenges-and-opportunities

Confidence in green financial instruments increasingly depends on transparency, robust definitions and the ability to measure and manage risk. According to the World Bank[7], one of the key challenges is the absence of a harmonised definition of "green", which makes it difficult to measure, compare and aggregate data. Reuters/IFC (2025) note that there are now more than 30 different green bond taxonomies worldwide, which creates complexity and barriers for global investors. This fragmentation underlines the importance of ongoing international work on taxonomy alignment and interoperability.

Green Bonds

Green bonds are debt instruments in which all or a substantial share of the proceeds are used for environmentally beneficial projects such as renewable energy, water management, waste treatment, clean transport or climate-adaptation investments (ICMA, 2025). Their structure is broadly similar to conventional bonds but they must comply with the ICMA Green Bond Principles (GBP), which rest on four pillars: (i) use of proceeds, (ii) process for project evaluation and selection, (iii) management of proceeds and (iv) reporting.

Green bonds are typically subject to external review, such as a Second Party Opinion (SPO) or certification under the Climate Bonds Initiative (CBI) standards, to ensure transparency and mitigate greenwashing (CBI, 2024). They have become the leading market instrument for raising capital for green projects. By the end of 2024 the GSS+ market (green, social, sustainability and sustainability-linked bonds) reached USD 6.9 trillion, with green bonds accounting for about 64 per cent (CBI, 2025). Because of their relatively high degree of standardisation and disclosure, green bonds not only scale up capital for green investment but also help standardise ESG information and support the measurement and disclosure of environmental impacts in global financial markets (OECD, 2024a). UNCTAD (2024) reports that the value of green bond issuance increased by 15 per cent in 2023, from USD 509 billion in 2022 to USD 587 billion, representing two-thirds of all sustainable bond issuance. Climate Policy Initiative (CPI, 2025) notes that green bonds dedicated to climate adaptation reached USD 18 billion in 2023, indicating a gradual broadening of eligible use-of-proceeds categories.

China has become one of the world's largest green bond issuers, with issuance of USD 37 billion in certain segments accounting for around 40 per cent of global labelled volumes and total domestic and international green bond issuance reaching USD 109.5 billion in 2021. Over three quarters of this growth has come from sovereign and quasi-sovereign issuers. As taxonomies are refined and criteria for resilience and adaptation become more clearly defined, adaptation-related investments are expected to feature more prominently in green bond use-of-proceeds frameworks.

In 2021 Korea's Ministry of Economy and Finance (MOEF) adopted the Korea Sovereign Green Bond Framework, aligned with the ICMA Green Bond Principles (2021) and CBI criteria. Sovereign green bonds are issued in both KRW and USD to finance renewable energy, low-

[7] https://documents1.worldbank.org/curated/en/788041573021878350/pdf/Full-Report.pdf

carbon public transport, energy efficiency and climate-adaptation projects. OECD (2024) reports that between 2021 and 2023 Korea's sovereign green issuance totalled USD 15.7 billion, with roughly 60 per cent of proceeds allocated to renewables, 25 per cent to energy efficiency and 15 per cent to sustainable transport. All projects must provide regular environmental impact reporting, be subject to SPO review and disclose information publicly via the national green budget data portal.

Demand for sustainable bonds and GSS instruments has increased sharply. Earth5R (2025) notes that cumulative GSS+ issuance exceeded USD 5 trillion by the end of 2024. GSS+ and sustainability-linked bonds are becoming core instruments for both advanced and emerging economies to finance clean-energy and sustainable-infrastructure programmes. Europe leads the market, accounting for 47 per cent of global green bond issuance in 2023, supported by the EU Green Bond Standard and the EU Taxonomy. France, Germany and the Netherlands are the largest issuers within the EU. China is the second-largest green bond issuer globally, with more than USD 180 billion issued in 2023 (CBIRC, 2024). The United States has seen rising issuance from corporates and sub-national entities, notably California, New York and Massachusetts. Chile and Brazil are pioneering large-scale sovereign sustainability bonds among emerging economies.

Green Credit

Green credit refers to loans and other financial products provided by banks or credit institutions to projects and firms that have a positive environmental impact and comply with national or regional green-finance criteria (UNEP, 2022). The World Bank (2023) describes green credit as a direct and flexible financing tool that enables the private sector to access funding on preferential terms when ESG standards are met. Green credit plays an important intermediary role between the financial system and climate objectives by embedding environmental risk into credit pricing and incentivising firms to transform production models and strengthen ESG risk management (World Bank, 2024).

Green credit is therefore a major conduit for climate finance provided by commercial banks under green lending criteria and ESG risk-management frameworks. China is among the earliest and most comprehensive developers of a green credit system, combining guidance, refinancing mechanisms and supervisory tools. Since 2012 the People's Bank of China (PBoC) has issued Green Credit Guidelines, requiring financial institutions to adopt green-credit strategies, integrate environmental and social assessment into credit appraisal and report regularly on their green loan portfolios. This created a unified standard across the banking system and stimulated the development of sustainable credit products.

From 2020 onwards PBoC strengthened the framework by introducing the Carbon Emission Reduction Facility (CERF), a flagship refinancing instrument designed to lower financing costs for green projects. Under CERF PBoC provides refinancing to commercial banks at a preferential rate of 1.75 per cent per year, covering 60 per cent of eligible loan principal for projects in energy efficiency, renewable energy and e-mobility infrastructure. By the end of

2023 CERF had supported about CNY 510 billion (around USD 70 billion) in loans, contributing to an estimated annual emissions reduction of 100 million tonnes of CO_2 (PBoC, 2023).

Backed by this policy framework and CERF support, China's green-credit stock has expanded rapidly. In 2024 outstanding green loans grew by about 19 per cent to CNY 35.75 trillion (roughly USD 4.9 trillion), concentrated in state-owned enterprises and large corporates. Lending is focused on priority sectors such as energy efficiency, renewables, low-carbon transport infrastructure and emissions-reduction technologies. The extension of CERF to the end of 2027 signals China's intention to continue using refinancing as a long-term financial lever to drive green transformation in the banking system. This policy not only reduces capital costs for mitigation projects but also shapes commercial banks' lending behaviour in a more sustainable direction.

Green Insurance and Disaster- and Climate-Risk Insurance Products

Rapid expansion of green insurance in major economies as climate-related disasters intensify

Green insurance is becoming an important financial instrument to mitigate climate risk and manage growing economic losses from natural disasters. In recent years major economies such as China, the United States and the European Union have seen strong growth in green-insurance markets. In China, for example, the Green Finance & Development Center (GFDC, 2024) reports that the green-insurance market grew by 23.4 per cent in 2024, while claim payouts rose by 77.8 per cent, reflecting both the rising frequency of extreme events and higher demand for protection of assets, crops and industrial facilities. Similar trends are visible in the United States, particularly in California and Florida where wildfire and hurricane risk has doubled climate-risk insurance demand within five years.

Expansion of national and regional catastrophe-risk insurance schemes

Many countries and regions are developing large-scale catastrophe-risk insurance schemes to pool risks and protect public finances. In the Caribbean the Caribbean Catastrophe Risk Insurance Facility (CCRIF) provides a prominent multi-country insurance mechanism that enables more than 20 states to access rapid disbursements after hurricanes and earthquakes. In Africa the African Risk Capacity (ARC) offers drought and flood insurance to over 30 countries, supporting households, agriculture and governments in climate-shock response. In Latin America Mexico and Chile operate national disaster-risk insurance programmes with World Bank support to cover major earthquake, flood and storm losses. These models mark a shift from purely commercial insurance to integrated sovereign and regional risk-pooling solutions.

Deeper integration of climate-risk insurance into financial and credit systems

A notable trend is the increasing requirement by banks, lenders and investors that companies hold climate-risk insurance when obtaining finance or participating in large infrastructure

projects. In Europe, for instance, offshore wind projects typically require operational, business-interruption and weather-risk insurance. In the United States insurers are working closely with the SEC to integrate climate risk into corporate financial reporting standards. In Japan and Korea companies in clean-energy supply chains must carry environmental-liability insurance when manufacturing renewable-energy equipment or green materials. These developments show that climate insurance is becoming a prerequisite for access to credit and investment.

New insurance products for a low-carbon and climate-resilient economy

Beyond traditional catastrophe insurance, many countries are launching innovative insurance products to support energy transition and low-carbon development. In Germany and Denmark technology-risk insurance is being used for green hydrogen, energy-storage and smart-grid projects. In Japan insurance for carbon capture and storage projects is being developed to protect firms against leakage or technological failure. Singapore and the United Kingdom are piloting transition-risk insurance to reduce financial risk for companies on net-zero transition pathways.

Index-based insurance is emerging as a key tool in developing countries, particularly for agriculture, which is highly exposed to climate risk. Countries in Africa, South Asia and Southeast Asia such as Kenya, India, Bangladesh and the Philippines are expanding index-based schemes for crops, livestock and fisheries. These products rely on meteorological, satellite or damage-index data rather than traditional loss assessment, reducing operating costs and enabling faster payouts. IFC (2024) reports that index insurance has provided climate-risk coverage to more than 40 million smallholder farmers, helping protect livelihoods and easing pressure on post-disaster public relief budgets.

GFDC data for China confirm that green-insurance premiums grew by 23.4 per cent in 2024 while payouts increased by 77.8 per cent. Europe has expanded climate-risk insurance, especially in Germany, France and Spain after major floods and wildfires in 2022-2023. The United States has seen rapid growth in catastrophe insurance in Florida and California due to escalating hurricane and wildfire losses. CCRIF now covers 22 Caribbean states and ARC provides climate-risk insurance for African countries exposed to droughts and floods. Chile and Mexico operate sovereign earthquake and disaster-risk insurance with World Bank backing.

Transition Finance and Multi-Functional Nature-Based Assets

A new trend in green finance is the development of instruments not only for “pure green” activities but also for the transition of high-emitting industries and the financing of nature-based assets and ecosystem services.

In China issuance of transition-related bonds rose by about 53.6 per cent in 2024, albeit from a low base. Many institutional investors and financial institutions are seeking instruments

linked to nature-based solutions and natural-capital outcomes, such as micro-insurance, direct green credit for conservation and biodiversity-linked financing.

In Japan the implementation of the GX Strategy is structured around three principal financial pillars: the GX Fund, GX Transition Bonds and Transition Loans. The GX Fund, managed by METI with a size of JPY 2 trillion (around USD 13 billion), is the main public funding source for low-emission technology innovation, especially in hydrogen, ammonia, carbon capture, utilisation and storage and offshore wind. By 2024 the Fund had disbursed JPY 420 billion to more than 80 projects, reducing emissions by around 12 million tonnes of CO_2 annually (OECD, 2024).

From 2024 the Government has also been issuing GX Transition Bonds, with a target to raise JPY 20 trillion (around USD 135 billion) over ten years and to catalyse public-private investment of JPY 150 trillion. Unlike traditional green bonds, GX Bonds channel funds to sectors in transition such as steel, chemicals and aviation rather than only to activities already classified as green. Each issuance is subject to independent SPO and quantitative environmental-impact reporting to ensure transparency and accountability. Notably, GX Bond proceeds are to be repaid from national carbon tax revenues (Carbon Levy) being introduced from 2024, creating a circular green-fiscal model in which carbon-pricing income is reinvested into emissions-reduction projects (Cabinet Office, 2024).

Complementing these instruments, Transition Loans provided by commercial banks and the Development Bank of Japan (DBJ) supply direct finance to companies whose transition plans meet METI criteria. These loans may be refinanced by the GX Fund or securitised through green bond issuance. The Climate Bonds Initiative (2024) reports that by the end of 2024 outstanding transition-loan volumes reached JPY 4.3 trillion (about USD 29 billion), double the level of the previous year, highlighting strong private-sector interest in transition finance.

Compared with the green-finance frameworks of the EU and Korea, Japan pursues a more pragmatic “sequenced transition” rather than an absolute green standard. While the EU Taxonomy focuses on activities that already meet stringent sustainability thresholds, METI’s Transition Taxonomy (2023) categorises “bridge activities” such as high-efficiency gas generation, grey hydrogen or fuel-recycling technologies. This approach reflects the realities of an energy-import-dependent economy, allowing Japan to maintain industrial stability while gradually reducing emissions in line with technological progress.

1.4.5 Blended Finance

Blended finance is emerging as a central mechanism for mobilising resources for sustainable development, particularly as emerging markets and developing economies (EMDEs) face tightening fiscal space and rising capital costs. According to the OECD Development Assistance Committee (DAC), blended finance refers to the strategic use of development-finance instruments to mobilise additional commercial finance for sustainable-development objectives. The definition emphasises the bridging role of development finance in attracting private capital, thereby expanding the total pool of resources available. Development finance

used in blended transactions may be concessional or non-concessional, depending on the structure and purpose of each investment.

BloombergNEF (2024) notes that blended-finance funds increasingly employ risk-sharing instruments such as credit guarantees, minimum-revenue guarantees, first-loss capital, and political- and currency-risk insurance. These tools reduce project-level risk and lower the cost of capital for renewable-energy projects and green-hydrogen infrastructure.

Blended finance is currently concentrated in mitigation sectors

Blended finance has been prioritised for renewable energy, electricity infrastructure, clean transport and low-carbon technologies. This aligns with global trends in which public budgets face constrained fiscal space. To meet the Paris Agreement objectives, EMDEs (excluding China) require at least USD 1 trillion per year in international climate finance, including blended finance (CPI, 2024).

During 2019-2021 total blended finance for climate reached USD 14 billion, down from USD 36.5 billion during 2016-2018 because of the pandemic and heightened investor caution amid geopolitical shocks. However, momentum strengthened after 2022. At COP28 several large-scale blended-finance arrangements were announced, including the ACT Climate Investment Fund, multiple Just Energy Transition Partnerships (JETPs), and the UAE's USD 30 billion Altérra initiative, of which USD 5 billion serves as catalytic capital aiming to crowd in two to three times more private finance (WEF, 2024).

Blended-finance models in Indonesia, South Africa and the Philippines are being used to accelerate early coal-plant retirement, reshape energy-sector supply chains, expand renewable-energy deployment and modernise electricity grids. Although still limited, blended finance has begun to expand into water management, climate-resilient agriculture, flood-protection infrastructure and saline-intrusion barriers. Many impact-investment funds now use blended structures to reduce risk and scale climate investment in Asia and Africa.

China has established the National Green Development Fund (GDF), a blended-finance investment vehicle with an initial size of CNY 88 billion (around USD 12 billion). It combines public budgeting resources with capital from state-owned and private enterprises. GDF finances clean energy, green urban development, water treatment and circular agriculture. OECD (2024) identifies GDF as a key mechanism for mobilising private capital into hard-to-abate sectors through risk-sharing instruments.

Private-sector mobilisation remains limited despite significant potential

Although blended finance is widely expected to attract large-scale private investment, actual mobilisation has been modest. OECD (2024) reports that in 2023 development-finance institutions (DFIs) mobilised only USD 70 billion of private capital, and fewer than 20 per cent of DFI portfolios treat private-capital mobilisation as a core operational objective.

Major barriers include:

- high country-risk and currency-risk premiums in EMDEs
- an insufficient pipeline of bankable projects
- high cost of capital
- weak risk-sharing structures, including limited use of credit guarantees, revenue guarantees and first-loss capital.

IMF (2023) stresses that blended finance only reaches scale when policy risks are mitigated in advance, particularly in the energy sector and large-scale infrastructure.

Blended-finance flows remain highly uneven across regions and income groups. Africa receives the largest share, followed by Latin America and the Caribbean, South Asia, East Asia and the Pacific, and the Middle East and North Africa. Most blended-finance resources reach middle-income countries (MICs), whereas low-income countries (LICs) and least developed countries (LDCs) receive only a small fraction (OECD, 2024). The imbalance reflects a tendency to prioritise higher-return projects rather than countries with the most urgent adaptation needs. UN and G20 reports (2024-2025) highlight this as a "climate-finance equity gap".

Enterprises and project developers receive the largest share of blended-finance commitments

OECD (2024) finds that enterprises and project developers accounted for 78 per cent of total blended-finance commitments for climate during 2019-2021, compared with 70 per cent in 2016-2018. The remaining share went to SMEs, entrepreneurs and innovation-driven business models. This pattern aligns with the rapid scaling-up of sectors such as rooftop solar, offshore wind, regenerative agriculture, voluntary carbon markets, hydrogen technologies and battery-energy storage systems. These activities generally offer higher potential returns than adaptation sectors, making them more attractive for blended finance.

1.4.6 Carbon pricing mechanisms

Carbon pricing remains one of the most important policy tools for reducing emissions and achieving carbon-neutrality commitments. In recent years more countries have adopted carbon taxes and emissions trading systems as core components of their green-transition strategies.

An ETS is a market-based carbon-pricing mechanism in which governments set a cap on total allowable emissions for specific sectors or for the economy as a whole. They then allocate or auction emission allowances, which can be traded by enterprises. The price emerging from this market reflects the economic cost of emitting greenhouse gases (WB, State and Trends of Carbon Pricing 2024). ETS combines a regulatory cap with market flexibility, allowing firms to find the least-cost emission-reduction pathway. Each tonne of CO_2 equivalent must be matched with an allowance, and firms may buy or sell allowances depending on their

compliance needs. Allowances may be allocated for free or auctioned, which enables both emission control and revenue generation. ETS is accompanied by monitoring, reporting and verification requirements, electronic registries and climate-transition funds that deploy auction revenues for green investment.

ETS provides a clear carbon-price signal, encourages technological innovation, helps firms reduce emissions at lower cost and generates stable revenue for public finance. The World Bank (2024) reports that carbon-pricing mechanisms, including ETS, now cover around 28 per cent of global emissions and generate more than USD 100 billion per year in public revenue.

As of 2025 there are 113 operational carbon-pricing instruments: 43 carbon taxes, 37 ETSs and 33 government-regulated crediting mechanisms (World Bank, 2025). These instruments cover about 28 per cent of global greenhouse-gas emissions, up from 24 per cent in 2023. Countries with carbon-pricing systems represent nearly two-thirds of global GDP, signalling a shift from political commitments to market-level implementation. Revenue from carbon pricing reached USD 84 billion in 2021, USD 106 billion in 2023 and approximately USD 103 billion in 2024 (67% from ETS and 33% from carbon taxes).

However, current carbon-price levels remain far below those required for Paris-aligned pathways. Explicit carbon prices range from USD 0.1 to USD 160 per tonne. Only 6 per cent of global emissions are subjected to an effective carbon price once exemptions and free allocations are accounted for. Around 74 per cent of covered emissions face prices below USD 20 per tonne, far below the Stern-Stiglitz recommendation of USD 40-80 per tonne by 2020 and USD 50-100 per tonne by 2030 (I4CE, 2025).

In 2023 fossil-fuel subsidies in advanced economies reached around USD 572 billion, significantly higher than global carbon-pricing revenue, highlighting **a structural misalignment that weakens climate-policy effectiveness.**

Europe remains the global leader, expanding its "next-generation" ETS

The EU continues to lead global carbon-pricing reforms, anchored by the EU ETS, the world's largest carbon market. Recent reforms include:

- **(i)** **ETS2 (road transport and buildings):** from 2027 carbon pricing will extend to fuel for road transport and heating, two high-emission sectors previously outside the ETS.
- **(ii)** **Expanded use of ETS revenues:** all ETS2 allowances will be auctioned, with a significant share channelled to the Social Climate Fund (SCF) to support vulnerable households, micro-enterprises and energy-efficiency investment.
- **(iii)** **Carbon Border Adjustment Mechanism (CBAM):** since 2023 imports of steel, cement, fertiliser, aluminium, electricity and hydrogen must report embedded emissions. From 2026 full carbon-cost charges will apply, reducing carbon

leakage and pushing international supply chains towards higher climate standards.

Emerging economies accelerate carbon-pricing adoption

Several fast-growing economies have introduced or expanded carbon-pricing mechanisms. Brazil approved its National Carbon Market Law in 2024, with an ETS expected by 2026. India launched the Carbon Credit Trading Scheme (CCTS) in 2023-2024 as a precursor to a national ETS. Turkey initiated a pilot ETS in 2025 to comply with CBAM requirements. Korea is preparing its fourth ETS phase with stricter caps and expanded auctioning.

China's national ETS remains the world's largest, covering more than 2,200 power-sector enterprises and around 4.5 billion tonnes of CO_2 per year—about 40 per cent of national emissions (MEE, 2023; World Bank, 2024). Unlike the EU model, China adopts a "cap-and-intensity" design in which allowances are based on output-adjusted emission-intensity benchmarks rather than an absolute cap, allowing economic growth alongside efficiency improvements. Allowances are allocated free of charge in early phases and traded on the Shanghai Environment and Energy Exchange (SEEE).

According to the National ETS Progress Report (MEE, 2024), more than 250 million tonnes of CO_2 were traded during the first two years, with prices ranging from 40 to 80 CNY per tonne (USD 6-11). While lower than EU ETS prices, the level provides a meaningful market signal, supported by gradually tightening intensity benchmarks. China is preparing to expand ETS coverage to seven heavy industries, including steel, cement, chemicals, aluminium, aviation, pulp and paper, and refining, with coverage expected to reach 70 per cent of national emissions by 2030. The voluntary crediting scheme (CCER) is also being revitalised, enabling enterprises outside the ETS to generate credits from renewable-energy projects, afforestation and waste-management solutions.

IMF and World Bank (2024) estimate that China's ETS generates around CNY 15 billion annually for public revenue, which is reinvested in clean-energy deployment and industrial-technology upgrades—paralleling the role of the EU Innovation Fund. However, China's experience shows that the effectiveness of carbon pricing depends not only on revenue generation but also on the design of the instrument and its alignment with broader policy frameworks. The national ETS has been progressively integrated with complementary measures such as energy-efficiency mandates, accelerated renewable-energy expansion and differentiated electricity pricing, helping to reinforce decarbonisation incentives. This underscores a key lesson for all countries: carbon pricing cannot deliver transformative emission reductions in isolation; it must be embedded within a coherent package of energy-sector regulation, industrial policy and fiscal incentives to support an effective green transition.

In Africa, the African Development Bank (AFDB, 2025) is leading the African Carbon Markets Initiative (ACMI), aiming to increase supply of high-quality carbon credits to 300 million

annually by 2030, support MRV and certification and attract institutional investors into forestry, biochar and regenerative agriculture.

Global carbon pricing remains low compared to Paris Agreement targets

IMF (2024) estimates that the global average carbon price is only USD 22 per tonne. Only a handful of jurisdictions approach Paris-aligned levels: the EU ETS (60-90 EUR), Sweden (> USD 140), the UK, Canada and New Zealand (50-80 USD). Many systems in Asia, Africa and Latin America remain below USD 10, limiting behavioural change and investment signals.

The voluntary carbon market continues to face challenges relating to transparency, credit quality and MRV costs. Strengthening standards, improving project governance and expanding coverage to agriculture and land-use sectors remain priorities.

Use of carbon-pricing revenues follows three major global patterns:

(i) Social support - EU, Canada, Switzerland and Korea allocate significant revenue to cushion vulnerable households and micro-businesses.
(ii) Energy-transition investment - EU, Singapore and Japan direct revenue towards renewable energy, hydrogen, energy storage and power-grid upgrades.
(iii) Industrial transformation - Japan's GX Fund, EU's Innovation Fund and Canada's industrial decarbonisation schemes support low-carbon technologies in steel, cement and other hard-to-abate sectors.

EU ETS revenues have become a critical public-finance source for national and EU-level climate policies. National governments retain most revenue but must spend it on climate-related activities such as renewable energy, efficiency improvements and industrial decarbonisation. Additional funds, including the Innovation Fund and Modernisation Fund, provide EU-level support for large-scale technological innovation and power-sector modernisation. The Modernisation Fund alone could reach EUR 57 billion during 2021-2030 at a carbon price of EUR 75 per tonne.

In 2023 EU governments allocated around EUR 9.7 billion to renewable energy, power grids and storage, EUR 2.3 billion to building-efficiency upgrades, EUR 5.1 billion to public transport and EUR 0.7 billion to industrial-emission-reduction projects. These figures illustrate the strong leverage effect of ETS revenues in reducing transition costs and attracting private investment.

However, ETS revenues are vulnerable to market cycles. **The carbon-price decline in 2024 demonstrated the need for fiscal buffers, contingency mechanisms and flexible investment planning to prevent climate-policy disruption.**

1.4.7 Other innovative initiatives

Guarantees and risk-mitigation instruments

Guarantees and other risk-mitigation instruments, such as political-risk insurance, credit-risk insurance and revenue guarantees, cover risks that private investors are unwilling to bear. These tools effectively address credit, political and revenue risks. Guarantees are particularly well-suited to projects relying on government-backed revenue streams or projects requiring demonstration of revenue-generating capacity, including nature-based solutions.

Recent innovations include local-currency guarantees, local-currency green bonds and local-currency lending through national development banks supported by concessional international finance. These mechanisms enable climate investments to be structured, financed and repaid in domestic currency, reducing exchange-rate risk for borrowers.

International interest in using guarantees for clean energy and climate-resilience investment has expanded rapidly. Guarantees attract new investor classes, distribute risk more efficiently and enhance creditworthiness. Different guarantee types can target risks at specific stages of the project life cycle.

Regulatory experimentation

The People's Bank of China (PBoC), Ministry of Finance and National Development and Reform Commission (NDRC) have jointly designated nine Green Finance Pilot Zones, including Zhejiang, Jiangsu, Hunan and Guizhou, to test carbon bonds, green credit products, environmental-liability insurance and corporate ESG-rating mechanisms. According to the World Bank (2024), total green credit in China's banking system has reached CNY 28.9 trillion (around USD 4 trillion), representing almost 11 per cent of total outstanding credit and an average annual growth rate of 25 per cent, the largest green-credit programme in the world.

1.5 Multi-dimensional and value-chain-based transition

1.5.1 ESG Investment

ESG has become a central pillar in the operational mechanisms of modern finance and business.

In recent years, Environmental, Social, and Governance (ESG) investing has emerged as a dominant trend in global finance. It is no longer merely an ethical or corporate social-responsibility consideration but a core component of long-term economic strategy aimed at optimising capital efficiency, mitigating risk, and delivering sustainable growth. Across the world, international organisations, investment funds, and regulatory authorities are decisively shifting towards sustainable-finance models, reflecting a growing recognition that environmental, social, and governance factors lie at the heart of the modern risk-return structure of enterprises.

At its core, the ESG framework comprises three clusters of criteria:

- **Environmental**: measures a company's impact on climate change, carbon emissions, water and waste management, resource extraction, biodiversity loss, and pollution.
- **Social**: evaluates issues such as labour rights, community relations, human rights, gender equality, health and safety, and diversity and inclusion.
- **Governance**: assesses transparency, anti-corruption measures, board independence, executive remuneration, shareholder rights, and accounting integrity.

Recent research consistently demonstrates the positive impact of strong ESG performance on financial returns and corporate resilience. According to the Network for Greening the Financial System (NGFS, 2025 update), ESG integration is now regarded as an essential tool for managing transition risks and steering capital flows towards net-zero objectives. The NGFS scenarios published in October 2025 confirm that orderly transition pathways, supported by robust ESG frameworks, significantly reduce inflationary shocks and energy-market imbalances. A 2024 study by Muhammad Sadiq covering ten ASEAN economies found that firms with high ESG scores exhibit stronger alignment with the Sustainable Development Goals (SDGs) and attract substantially higher levels of international capital. In the People's Republic of China, research by Cheng Chen (2024) demonstrates that elevated ESG ratings drive green technological innovation through enhanced production-process discipline. Akhil Pasupuleti (2025) shows that, post-COVID-19, the correlation between ESG performance and market valuation (share price and cost of capital) has strengthened markedly, particularly in high-emission sectors. Rothschild & Co (2025) reports that companies with top-quartile ESG scores achieve 4-6 percentage points higher gross profit growth than peers, thanks to superior risk management and brand reputation. Grand View Research (Q3 2025) notes that ESG funds have outperformed conventional funds by an average of 210 basis points during periods of market volatility since 2022, while continuing to attract long-term inflows from pension funds and insurers. These findings confirm that ESG is a value-creating economic and financial paradigm that lowers the cost of capital, enhances competitiveness, and strengthens corporate resilience.

In terms of scale, the global ESG investment universe has expanded dramatically. According to the Global Sustainable Investment Alliance (GSIA, 2024 review), sustainable investment assets reached USD 35.1 trillion by the end of 2024, with Bloomberg Intelligence (November 2025) forecasting that ESG assets under management will exceed USD 53 trillion by 2030, representing approximately one-third of projected global AUM. Europe remains the undisputed centre, accounting for 44 % of global sustainable assets, underpinned by the comprehensive regulatory ecosystem of the EU Taxonomy (fully implemented 2023-2025), Sustainable Finance Disclosure Regulation (SFDR), and Corporate Sustainability Reporting Directive (CSRD). In the United States, ESG assets stood at USD 9.8 trillion in 2024, dominated by index funds and green ETFs. Japan, the Republic of Korea, Singapore, and Australia lead the Asia-Pacific region through integrated national green-finance frameworks, clean-energy strategies, and deep sustainable capital markets.

Sectoral ESG capital flows

The International Energy Agency's World Energy Investment 2025 (published June 2025) projects total energy-sector investment of USD 3.3 trillion in 2025, a real increase of 3 % over 2024. Of this, USD 2.3 trillion is directed towards clean energy (renewables, grids, storage, low-emission fuels, efficiency, and electrification), more than double the USD 1.1 trillion still flowing to fossil fuels. This marks the first year in which clean-energy investment definitively surpasses fossil-fuel investment on a sustained basis - a clear signal that the "clean electrification era" is now structurally entrenched.

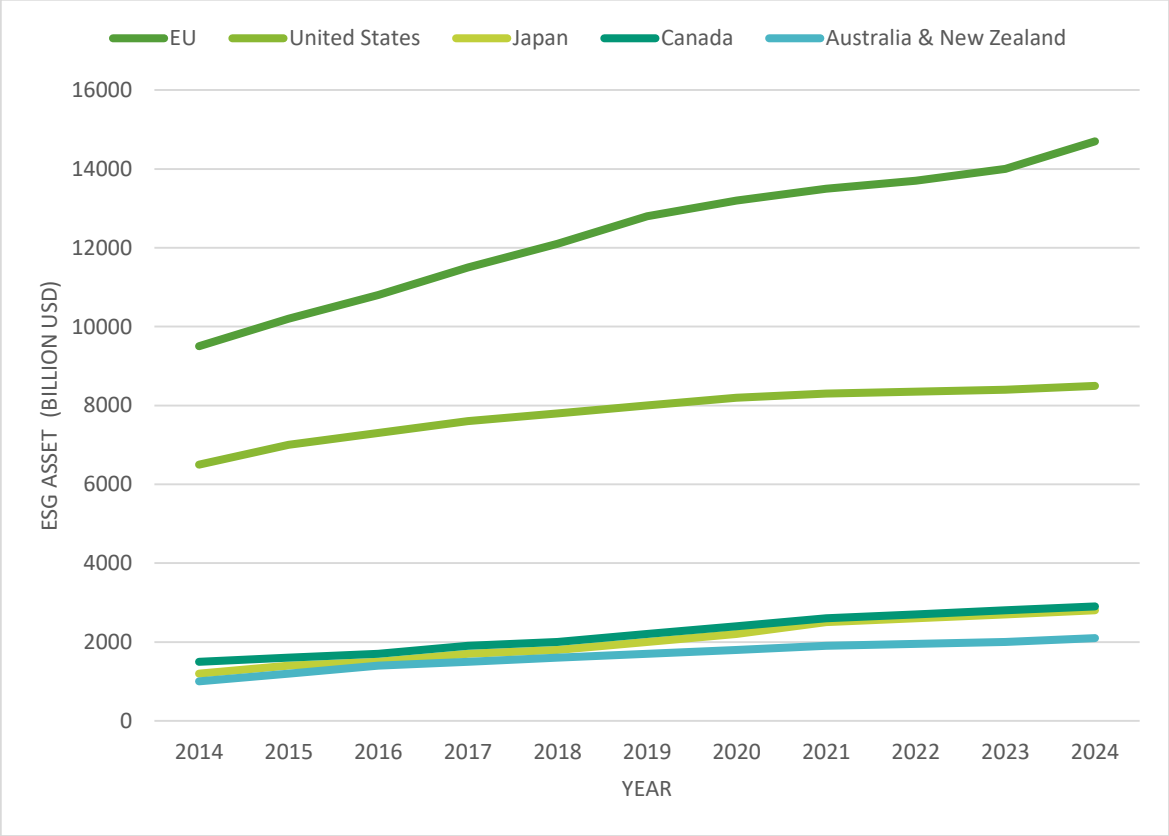


Figure 3: Growth of global sustainable investment assets by region, 2014 - 2024

Source: Authors' visualization based on GSIA (2024) and Bloomberg Intelligence (2025)

To achieve net-zero emissions globally, the IEA estimates that annual clean-energy investment must rise from the current USD 2.1 trillion to USD 5 trillion by 2030, with the private sector providing the majority. Renewable energy (especially solar PV, onshore/offshore wind, and hydropower) continues to dominate ESG inflows. In 2024, global renewable-energy investment reached a record USD 2.1 trillion, representing over 75 % of new energy-generation capacity finance. Leading ESG investors, including Brookfield Renewable Partners, BlackRock's Renewable Power franchise, NextEra Energy, and Ørsted, have become strategic owners of global clean-energy infrastructure while pioneering de-risking instruments for projects in emerging markets.

Green hydrogen has emerged as a new cornerstone of the low-carbon economy. The European Union, Japan, the Republic of Korea, Australia, and Chile have all enacted national

hydrogen strategies, with combined public and private commitments exceeding USD 680 billion to 2030. The EU Innovation Fund allocated EUR 4.1 billion in its 2024-2027 work programme exclusively to large-scale green-hydrogen production, electrolyser manufacturing, and derivative fuels (ammonia, methanol).

Green Artificial Intelligence (Green AI) is now a distinct ESG investment theme. Inrate and Rothschild & Co (Q4 2025) highlight that technology giants such as Google, Microsoft, and Nvidia are restructuring data-centre portfolios towards carbon-neutral facilities, energy-efficient chips, and AI algorithms that minimise electricity consumption. Dedicated Green AI funds raised USD 48 billion in 2024-2025, primarily from European pension funds and sovereign wealth funds.

The circular economy attracted 14 % of total ESG capital in 2024 (Grand View Research, 2025), with flagship corporates (Unilever, IKEA, Apple, Interface) committing to fully circular supply chains by 2030-2040.

Despite rapid growth, ESG markets face persistent challenges: (i) heterogeneity in ratings methodologies and data quality, leading to significant divergence in scores for the same company; (ii) continuing greenwashing risks, prompting ever-tighter disclosure rules in the EU (CSRD), the US (SEC climate rules effective 2026), and Japan; and (iii) institutional-capacity gaps in emerging markets, where ESG implementation remains largely voluntary and suffers from inadequate national data infrastructures and independent verification bodies.

1.5.2 Socio-economic and fiscal dimensions of the energy transition

The energy transition also generates profound socio-economic impacts. Sustainable energy policies and technologies deliver cost savings, job creation, enhanced competitiveness, and reduced dependence on price-volatile fossil imports (Chen et al., 2019). Four core pillars underpin a sustainable energy-transition pathway: (1) sustainable energy governance and economics; (2) renewable-energy production and consumption; (3) environmental impacts of energy systems; and (4) electric mobility and energy storage. For Viet Nam, each of these pillars carries direct implications for fiscal planning, public investment allocations, industrial policy and long-term growth competitiveness.

Financing needs remain immense

The International Renewable Energy Agency (IRENA, World Energy Transitions Outlook 2025) estimates that cumulative investment of USD 150 trillion will be required globally by 2050 to limit warming to 1.5 °C, equivalent to roughly USD 5.7 trillion annually. In developing and emerging economies (excluding China), annual clean-energy investment must rise eight-fold from current levels to exceed USD 1.3 trillion by 2030 if the world is to remain on a net-zero trajectory.

The energy transition will require significantly higher levels of corporate and household borrowing. The affordability of the shift to clean energy will depend on reducing costs and

improving access to finance. Many clean-energy technologies such as wind power, solar power and electric vehicles demand relatively high upfront investment, which is offset over time through lower operating and fuel costs. Moving towards a more capital-intensive energy system means that maintaining low financing costs will be essential to accelerating the transition while keeping energy affordable. This underscores the importance of a stable macro-fiscal environment, predictable incentive regimes, and credible public-private financing frameworks.

At present, many developing economies and emerging economies lack a clear vision, or the supportive policies and regulatory environment needed to facilitate a rapid energy transition. Debt burdens are rising across numerous economies, and few Governments in developing and emerging economies have the fiscal space to mobilise resources for sustainable recovery. This implies that the financing needs for the energy transition will be substantial for both developed and developing countries, while Government resources for the transition remain insufficient to meet demand. For Viet Nam, this further highlights the need to scale green budgeting, expand climate-aligned borrowing instruments, and strengthen the investment and FDI frameworks guiding green industrial development.

The emerging trend of embedding justice within energy-transition governance

A prominent global trend in energy-transition policy is the integration of three dimensions of justice, distributive, procedural and recognitional, throughout the entire process of policy design and implementation. Countries are shifting from “single-track emissions-reduction frameworks” towards “cross-sectoral legal and governance systems” that ensure the energy transition is transparent, accountable and inclusive of vulnerable groups. This approach is evident in the development of dedicated legal mechanisms, multi-level coordination structures and formal channels to ensure the participation of communities most affected by the transition. This trend is increasingly linked to fiscal policy, regional development planning and labour-market support mechanisms, reinforcing the need for finance ministries to shape just-transition funding models and compensation frameworks.

Canada is a leading example of this trend, becoming the first country to enact a Just Transition Act (2024). The Act establishes a comprehensive legal architecture for a just energy transition across federal, provincial and local levels, while domesticating Canada’s commitments under the Paris Agreement. Its distinctive feature is the deep integration of all three justice principles into every policy stage - from planning and consultation to resource allocation and monitoring. Unlike many countries that continue to rely on centralised or weakly coordinated models, Canada has positioned human rights and social equity as core pillars of climate-policy governance. Importantly, the Act also requires that fiscal transfers, public investment, and labour-adjustment funding be aligned with transition goals, an approach highly relevant for Viet Nam as it designs just-transition measures for coal regions.

Colombia represents the growing movement among developing countries to embed social justice within energy-transition policy. The government has placed the “Just Energy

Transition" at the centre of public policy, prioritising protection of livelihoods in the mining sector and enhancing women's and Indigenous communities' access to energy. The National Energy Transition Plan (2022) and the long-term PEN 2050 strategy aim to reduce reliance on fossil fuels and increase the share of renewables, particularly solar and wind. A central feature of Colombia's approach is the FPIC mechanism - free, prior and informed consent - which is mandatory for all energy projects in Indigenous territories such as La Guajira. While this tool is essential for procedural and recognitional justice, its implementation has faced challenges that have delayed several projects. Legal instruments including Law 1715 (2014) and Law 2099 (2021) provide the foundation for renewable energy and green hydrogen while safeguarding the rights of affected communities. These experiences highlight that early social engagement and transparent compensation frameworks reduce fiscal risks, project delays and investor uncertainty.

In Germany, the just-transition orientation is embedded in the Renewable Energy Act (EEG) and the Coal Phase-Out Act (CPGTA) - the two central pillars underpinning the country's move away from coal and its support for economic restructuring in coal-dependent regions. Germany's model combines energy policy with labour and social-policy instruments to ensure an orderly transition that minimises impacts on workers and local communities. The use of multi-year, fiscally backed regional development packages provides a model for Viet Nam as it plans long-term restructuring strategies for coal provinces.

Overall, international experience shows that a just energy transition is becoming a new policy norm worldwide, characterised by three key shifts: (i) the establishment of national legal frameworks dedicated to just transition; (ii) the deep integration of justice principles into energy-sector decision-making and governance; and (iii) the deployment of tools that protect vulnerable communities, from livelihood assistance and vocational training to mandatory consultation mechanisms such as FPIC. For Viet Nam, these elements imply the need for fiscally sustainable just-transition funds, targeted skills programmes and regional adjustment policies.

Countries in transition exhibiting limitations in distributive and recognition justice

Morocco illustrates a rapid energy transition that nevertheless lacks distributive fairness. Despite ambitious targets, including a 52 per cent renewable-energy share by 2030 and large-scale solar developments such as Noor Ouarzazate, economic benefits have accrued mainly to foreign investors, while local communities have faced resettlement with limited consultation. This experience shows that without benefit-sharing mechanisms and transparent project selection, energy-transition efforts risk generating social instability and undermining long-term policy sustainability**.** It also demonstrates the fiscal consequences of inadequate local compensation frameworks and weak alignment between national investment planning and community outcomes.

Scotland (United Kingdom) demonstrates attempts to restore distributive justice through the Fair Work Transition Programme, which supports coal and oil-and-gas workers in shifting to

new professions. The Transition Fund has been designed to ensure that benefits from renewable energy are equitably distributed to coastal communities. Scotland's experience underscores the importance of financial transparency and long-term planning in maintaining public trust. This aligns closely with Viet Nam's need to design transition-support mechanisms for workers in carbon-intensive sectors.

Türkiye exemplifies a transition marked by weak procedural justice. Although renewable energy has expanded rapidly, many solar and hydropower projects have been implemented without adequate engagement with affected communities, resulting in land-use disputes and eroding public confidence.

Poland highlights the difficulties that arise from limited political consensus and constrained fiscal capacity. Despite receiving support from the EU's Just Transition Fund, Poland continues to rely heavily on coal, which accounts for roughly 70 per cent of electricity generation, and has delayed plant closures due to tensions among government, industry and trade unions. Both Türkiye and Poland demonstrate that when social factors are marginalised, the energy transition may stall or even reverse. These cases show that fiscal readiness, social protection and clear, well-sequenced industrial-transition plans are indispensable for policy credibility.

1.5.3 Development of green value chains and global trade standards

Integration of trade measures into NDC

International trade plays a crucial role in helping countries realise the objectives of the Paris Agreement and the SDGs by facilitating access to green goods, services and technologies that are essential for emissions reduction and climate adaptation. In many countries, measures set out in their NDCs depend heavily on imported goods and services such as electric vehicles, solar panels and specialised green engineering services. Trade conditions, particularly tariffs, directly influence costs and consumer access.

To design strategic climate-trade policies it is necessary to identify the key imported goods and services that are linked to priority sectors in each country's NDC. This process must consider both existing and emerging technologies, as well as domestic production capacity, in order to select appropriate trade measures.

UNFCCC (2024) proposes a six-step process for integrating trade measures into NDCs, including the identification of priority areas, the selection of strategic trade sectors and the design and application of suitable measures.

In addition, the creation of new sustainable value chains can enhance domestic resource mobilisation, support economic and industrial strategies and strengthen climate resilience. Embedding climate objectives into national development plans, sectoral policies and investment and trade strategies is essential to improve policy coherence and maximise synergies between emissions reduction, economic growth and social development (OECD, 2025).

For Viet Nam, this implies aligning green-trade policies with fiscal and industrial-policy tools under the Ministry of Finance, including tariff reforms, investment incentives and green-FDI prioritisation.

Greening global value chains as a pillar of economic and trade strategy

Between 2020 and 2025 global trade has shifted strongly towards a green-trade model as major economies introduce a wide range of new standards on carbon, traceability and sustainability. Cross-border carbon adjustment mechanisms such as the CBAM are reshaping cost structures along global value chains. Producers in emerging economies now face pressure to measure, verify and reduce emissions in their production processes in order to remain competitive. This has knock-on effects across entire supply chains, compelling exporting firms to comply with increasingly stringent environmental requirements to retain market access.

Regions that are leading this trend include the EU, the United States, Japan, the Republic of Korea and China, all of which are pursuing carbon-neutrality strategies and applying sustainability criteria to trade and production.

These shifts highlight the need for domestic industries to upgrade technology, reporting systems and energy use, areas that require fiscal incentives, green-credit schemes and investment-framework reforms.

Shifts in investment and production towards cleaner value chain

Global FDI in renewable energy has risen sharply (UNCTAD, 2024). Multinational enterprises are restructuring their supply chains in line with ESG principles, requiring suppliers to adopt emissions-reduction policies, commit to the use of renewable energy and phase out high-emitting partners. For example, Apple requires 100 per cent of its suppliers to cut emissions and use renewable energy by 2030. Toyota and BMW require “green steel” and “green aluminium”. Firms with green supply chains enjoy priority in long-term contracts and investment allocations.

For Viet Nam, this reinforces the importance of creating a predictable green-investment regime, green-tax incentives and carbon-pricing signals that reduce transition risks for exporting firms.

Requirements for Global Green Value Chains

- **Countries are moving from “greening domestic production” to “greening the entire value chain”.** This includes sustainable export standards, carbon traceability, emissions reduction in logistics and the application of instruments such as the EU CBAM, due-diligence rules and ESG requirements. These changes drive reforms in technical standards, quality assurance, production technologies and logistics, illustrating how the green transition now permeates every stage of value chains from agriculture and industry to financial services. Measuring CO_2 and other emissions across value chains also increases the accountability of firms and states. For MoF, this

requires coordinated policies on customs modernisation, incentives for low-carbon logistics and targeted support for firms exposed to CBAM-related compliance costs.

- **Low-carbon product standards and MRV requirements are becoming more stringent.** Global supply chains increasingly demand certification of product carbon footprints (PCF). In the EU, the Corporate Sustainability Reporting Directive (CSRD) and the EU Taxonomy apply to companies operating in the Single Market. In the United States, listed companies will be required to disclose climate-related information under forthcoming SEC rules, expected from 2025. Firms therefore need to invest in carbon-accounting systems, emissions-measurement technologies and energy-efficient production processes. The implication is clear: Viet Nam must develop national PCF guidelines, accredited verifiers and digital MRV systems, with fiscal tools to support adoption by SMEs.

- **Traceability and sustainability standards are tightening.** The EU has introduced the Regulation on deforestation-free supply chains (EUDR), which requires coffee, rubber, timber, cocoa and palm oil, among others, to be traceable down to the plot level. Japan applies similar standards in fisheries and textiles. Agricultural-food and textile supply chains are heavily affected and must develop digital traceability systems using GIS and blockchain. Developing national traceability infrastructure (GIS, blockchain, digital customs systems) will require MoF involvement in investment appraisal and budget allocation.

- **Green standards on packaging, plastics, recycling and the circular economy are being strengthened.** The EU is implementing the Packaging and Packaging Waste Regulation (PPWR), which sets requirements on recycling, reuse and the reduction of single-use plastics. Japan, the Republic of Korea and Australia apply extended producer responsibility (EPR) regimes to packaging and electronic goods. The “green logistics” trend requires firms to cut transport emissions and optimise warehousing. Exporters must change product design, packaging, materials and logistics to comply with low-carbon standards. This implies clearer national standards, green-tax rules and incentives for recycling industries.

Technology transfer and knowledge spillovers in green value chains

Technology has become both a driver and a prerequisite for systemic green transition. Digital technologies support energy optimisation, emissions monitoring, waste management and real-time environmental quality measurement. Many countries integrate AI, IoT and big data into energy management, climate-smart agriculture and clean transport. Green fintech helps to make capital flows more transparent, measure project performance and standardise ESG reporting. MoF's growing role in promoting green fintech, through sandbox regulation, digital reporting standards and ESG-aligned financial supervision, is central to integrating these technologies into Viet Nam’s financial system.

China uses digital technology in a systematic way to control pollution and promote renewable energy. It invests heavily in AI and big data to operate large-scale solar and wind projects and deploys nationwide sensor networks and digital monitoring systems to track and control air and water pollution and industrial emissions in real time.

The United Kingdom focuses on green fintech. Platforms using blockchain and big data are increasing transparency in green capital flows and allow investors to measure the environmental performance of projects more accurately. These technologies also help firms automate data collection and analysis and standardise ESG reporting, making disclosures more transparent and comparable.

Diffusion of green technology through multi-tiered value chains

Global economic integration accelerates technology diffusion but most inventions still originate in advanced economies. The bulk of green innovation remains concentrated in industrialised countries. The United States, Germany and Japan account for a large share of climate-related patents and are the three largest green-innovation centres in the world. According to OECD (2013), almost 70-80 per cent of global green patents come from the larger OECD group (G7 plus the Republic of Korea and Scandinavian countries). Between 2009 and 2011 OECD countries accounted for about 88 per cent of environment-related patents while the BRIICS (Brazil, Russia, India, Indonesia, China, South Africa) accounted for only around 6.9 per cent. Advanced technologies cluster in developed economies, for example solar-component manufacturing in Germany and Japan, battery, EV and new-materials technology in the United States and the Republic of Korea, and wind-turbine technologies in Denmark. During that period the rate of patent growth in these countries far outpaced the rest of the world despite globalisation. Hence, innovation capacity is unevenly distributed and tends to concentrate in technological hubs of the global economy. This underlines the importance of targeted fiscal tools, including R&D tax credits, green-innovation funds, investment-linked incentives, to help Viet Nam close capability gaps.

Over the last five to ten years the landscape has shifted markedly. China became the single largest country of origin for energy-related patents in 2021, surpassing Japan and the United States. More than 95 per cent of China's energy patents in 2022 related to low-emission technologies. EPO data on clean-energy technology patents indicate that China, the Republic of Korea and Japan are the largest non-European sources of applications, with very rapid growth. For example, clean-energy patent filings at the EPO originating from China rose by more than 30 per cent in a single year. Several other emerging economies, such as India, Brazil and Türkiye, are also recording fast growth in patenting, including in clean technologies, although their absolute volumes remain far below those of the United States, the EU and Japan and China.

From these hubs technology spreads to developing countries through exports of equipment and machinery (for example PV modules, batteries, inverters, control systems), FDI by major corporations (Siemens, Vestas, Tesla, Toyota and others), technology-licensing and technical

training, as well as OEM and ODM contracts that give firms in developing countries access to advanced green-production processes.

Knowledge spillovers in green GVCs extend beyond machinery transfer. They also encompass technical and managerial practices such as green production processes, life-cycle assessment standards, emissions management and carbon auditing. Strict requirements imposed by lead firms oblige suppliers to meet higher environmental standards and have led to supplier-support programmes, technical training and knowledge sharing. This process helps enterprises in developing countries move from simple production tasks to higher value-added functions, enabling industrial upgrading and deeper integration into green value chains.

However, the diffusion of technology and knowledge in green GVCs is uneven across countries and sectors. The capacity to absorb technology depends heavily on firms' internal capabilities, including workforce skills, technical expertise, environmental management practices and innovation capacity. Emerging economies are increasingly integrated into global chains and import green technologies, yet South-South exchanges remain limited. For these economies, importing technology is feasible but meaningful participation in global green-technology chains requires stronger capabilities and robust environmental policies.

For less developed countries technology imports are still constrained. Policy priorities need to focus on building technological capabilities rather than relying solely on trade and FDI liberalisation. To seize opportunities countries and firms must strengthen R&D, develop human capital, improve environmental management, establish standards for emissions measurement along value chains and reinforce regulatory institutions to ensure corporate accountability and transparency.

However, without strong domestic capabilities, including data systems, skills, environmental management, innovation capacity, spillovers remain limited. This underscores the need for MoF-led reforms to incentivise green R&D, strengthen technology-transfer conditions in FDI projects, and prioritise green industrial clusters.

Countries with weak institutions, inadequate intellectual-property protection and poor GVC connectivity tend to have limited access to core technologies and find it difficult to move into higher value-added segments. This explains why some economies that attract large volumes of FDI have not yet significantly upgraded their domestic technological capacities.

1.6 Lessons for Viet Nam

International experience demonstrates that the success of a green transition depends not only on technology and sectoral policies but fundamentally on the strength of governance, fiscal systems, financial regulation and the institutional role of the finance-planning ministry. For Viet Nam, these lessons are highly relevant. The following insights synthesise global best practice and highlight implications for designing an integrated, financially coherent green-transition strategy.

Strengthening the governance foundations of the green transition

International experience shows that governance is the foundation of the green transition and determines whether net-zero commitments can be realised. An effective governance system must secure three elements: a strong central climate institution, close cross-sectoral coordination and robust mechanisms for monitoring, transparency and accountability. In particular:

- **Build a strong central institution for national climate coordination.** Experience from the United Kingdom, France, Germany and the Republic of Korea shows that governments need to play a central role through dedicated bodies with mandates to advise on, coordinate and oversee climate policy. Institutions such as the UK Climate Change Committee or inter-ministerial councils in France and Germany help align policies across ministries and create coherence in public administration.
- **Establish a stable, binding and long-term climate-legal framework.** Many countries have adopted climate laws or long-term climate strategies with legal force that set net-zero targets for 2050 and integrate these objectives into development and fiscal planning. OECD data indicate that more than 60 per cent of member states have long-term net-zero strategies, which support policy stability and attract private investment in clean energy, green infrastructure and environmental technologies.
- **Strengthen independent monitoring, transparency and accountability.** Countries such as France, Germany and the Republic of Korea have mandated government-established but independent bodies to track, assess and regularly publish progress on climate strategies. This approach reinforces transparency and public participation and provides a basis for evidence-based policy adjustment.
- **Promote horizontal and vertical coordination across the state and with social partners.** The EU and Canada emphasise inter-ministerial mechanisms and cross-sectoral working groups, combined with close coordination among central and local government, business and civil society. This reduces policy conflicts, accelerates implementation and helps to mainstream climate objectives across sectors.
- **Expand co-governance models to mobilise multiple stakeholders.** The state provides leadership while enterprises, communities and civil society share responsibility for delivering decarbonisation, renewable energy, clean transport and just-transition objectives.
- **Link green governance with open data and public-sector innovation.** The Republic of Korea and Canada use open-data platforms to track emissions, green budgets and policy performance, which builds social trust and enhances policy steering.

A key lesson for Viet Nam is that **climate governance must be paired with macroeconomic and fiscal governance.** Countries that succeed give the finance-planning ministry a central role in transition planning, from long-term target setting to budget allocation, carbon-pricing design and financial-sector regulation. International experience also shows that strong governance systems explicitly link climate strategy with medium-term fiscal frameworks,

public-investment plans and sovereign-risk assessments. This is essential for Viet Nam as MoF now leads both economic planning and national fiscal policy.

Designing an integrated strategy that balances mitigation, adaptation, and climate finance

International practice shows that responding to climate change requires an integrated strategy that balances mitigation and adaptation. Mitigation addresses the causes by reducing GHG emissions, while adaptation focuses on consequences by strengthening the resilience of economic, social and ecological systems. These pillars must be designed to complement each other in a fair and comprehensive transition. Specifically:

- **Develop an integrated climate strategy with legal force.** A national climate strategy should set a long-term vision and a credible pathway to net zero. It should be enshrined in law or a binding national strategy to ensure enforcement and accountability. The adoption of climate laws and strategies by Canada, Germany, France and Japan demonstrates a shift from voluntary pledges to legal obligations, helping to stabilise policy expectations and attract long-term investment. An effective strategy must be integrated with sustainable-development plans and national financial frameworks to ensure consistency in mobilising and allocating resources for mitigation and adaptation. Experience from the EU and OECD countries shows that mainstreaming climate goals into energy, transport, agriculture and urban planning increases investment effectiveness and reduces policy risk. A sustainable climate strategy therefore needs a firm legal basis, a long-term vision, integration of economic, social and financial dimensions and transparent monitoring systems to underpin a broad, equitable green transition.

Box 4: China

According to OECD (2024) and IMF (2024), China has created a "green transition policy trinity" consisting of:

i) an ETS that provides a carbon-price signal and market framework,
ii) the CERF and GDF that supply low-cost capital for low-emission projects
iii) green bonds and green credit that mobilise private finance.

This structure gradually internalises carbon costs across the economy without triggering output shocks and redirects financial flows towards clean sectors. World Bank (2024) estimates that thanks to the ETS and CERF China reduced total CO_2 emissions by about 3.5 per cent between 2021 and 2023 while maintaining average GDP growth of 5.2 per cent a year. However, the IMF highlights three major challenges: carbon prices remain below levels that reflect the full social cost of emissions, verification mechanisms lack transparency which raises data-integrity risks and the legal framework linking the ETS and voluntary carbon markets is still incomplete.

- **International practice shows that responding to climate change requires an integrated strategy that balances mitigation and adaptation.** Mitigation addresses the causes by reducing GHG emissions, while adaptation focuses on consequences by strengthening the resilience of economic, social and ecological systems. These pillars must be designed to complement each other in a fair and comprehensive transition. Specifically:
- **Develop an integrated climate strategy with legal force.** A national climate strategy should set a long-term vision and a credible pathway to net zero. It should be enshrined in law or a binding national strategy to ensure enforcement and accountability. The adoption of climate laws and strategies by Canada, Germany, France and Japan demonstrates a shift from voluntary pledges to legal obligations, helping to stabilise policy expectations and attract long-term investment. An effective strategy must be integrated with sustainable-development plans and national financial frameworks to ensure consistency in mobilising and allocating resources for mitigation and adaptation. Experience from the EU and OECD countries shows that mainstreaming climate goals into energy, transport, agriculture and urban planning increases investment effectiveness and reduces policy risk. A sustainable climate strategy therefore needs a firm legal basis, a long-term vision, integration of economic, social and financial dimensions and transparent monitoring systems to underpin a broad, equitable green transition.

Box 5: Effectiveness and spillover impacts of Japan's green transition policies

According to World Bank (2024), Japan currently has the third largest sustainable bond market in the world with cumulative issuance exceeding 380 billion USD, of which green and transition bonds account for around 70 per cent. Yields on GX bonds are on average 10-15 basis points lower than conventional government bonds, reflecting investor confidence in Japan's green transition strategy.

On the environmental side Japan has reduced national GHG emissions by 46 per cent compared with 2013 and renewables now supply almost 25 per cent of electricity. However, OECD (2024) and NGFS (2024) identify some remaining constraints, including heavy dependence on LNG imports, high costs of hydrogen and CCUS technologies and the fact that only about 20 per cent of firms in the GX League have clearly quantified emissions-reduction targets (GX League Report, 2024).

Japan is also actively exporting its GX model through the Asia Zero Emission Community (AZEC) initiative, which promotes cooperation with ASEAN countries on hydrogen, ammonia technologies and transition finance. Institutions such as JBIC and JICA have implemented many GX projects in Indonesia, Viet Nam and Thailand, supporting carbon-credit development and clean-energy investment (IMF, 2024).

- **Balance resources between mitigation and adaptation.** OECD countries such as Germany, Denmark and France are adjusting climate-budget structures so that at least 20-25 per cent of green expenditure is allocated to adaptation. Innovative instruments such as resilience bonds, catastrophe-risk insurance and regional climate-risk pools in Africa and the Caribbean have proved effective in reducing asset losses.
- **Promote mitigation through technology and markets.** Countries that perform well in mitigation have clear energy-transition roadmaps linked to carbon-pricing mechanisms and incentives for technological innovation. The EU, Canada, Germany and Japan show that combining electrification, renewable energy and mandatory energy-efficiency standards can cut emissions by 40-55 per cent within a decade. Instruments such as the EU ETS, Canada's carbon tax and China's cap-and-trade system generate stable revenues for climate funds. Investment in low-emission technologies such as hydrogen, energy storage, CCUS and low-carbon agriculture is becoming decisive in the medium and long term. CPI (2025) finds that investment in low-emission technologies accounts for nearly 30 per cent of new mitigation finance flows, highlighting the role of governments in combining fiscal incentives, green credit and public R&D. Effective mitigation therefore requires the integration of carbon pricing, technological innovation, energy transition and sustainable land management within a stable and transparent legal framework that encourages long-term private investment.
- **Shift climate adaptation from reactive response to proactive risk management.** If mitigation is about prevention, adaptation is about managing long-term risk. Experience from OECD (2025) and countries such as the Netherlands, Singapore and France shows that early investment in resilient infrastructure and sustainable urban planning is far cheaper than post-disaster reconstruction. Key measures include upgrading drainage systems, climate-resilient buildings, expanding green spaces and integrating climate considerations into public-investment planning ("climate proofing"). Early-warning systems and climate-risk insurance are also crucial tools for limiting socio-economic losses. In Bangladesh and Japan the combination of climate forecasting, satellite data and agricultural insurance has reduced disaster damage by 30-50 per cent. Nature-based solutions such as restoring mangroves, coral reefs and wetlands provide low-cost options with significant co-benefits for the environment, livelihoods and eco-tourism. Adaptation must therefore become a core component of national development planning, public finance and climate insurance with the aim of strengthening community and ecosystem resilience.
- **Ensure a just transition and social cohesion in mitigation and adaptation.** Climate transition is sustainable only if it is accompanied by a just transition. Germany, South Africa and Canada have established Just Transition Funds to support worker retraining, develop green jobs and invest in social infrastructure in regions dependent on coal or other fossil-fuel-based industries. This prevents social disruption and local economic shocks. All mitigation and adaptation strategies should therefore put social equity and

inclusion at their centre to ensure that no group is left behind in the shift towards a low-emission economy.

An important lesson for Viet Nam is that **climate strategy must be embedded in macro-fiscal frameworks.** Leading countries link climate goals to medium-term expenditure plans, national debt strategies, public-investment systems and industrial-policy financing.

Promoting green trade and low-carbon value chains as new growth engines

Recent international experience shows that the move towards green trade and low-carbon value chains is not only an inevitable trend under the Paris Agreement and SDGs but also an emerging driver of global economic growth. Countries increasingly integrate green-trade measures into their NDCs to cut emissions, diversify exports and strengthen economic resilience. Key lessons include:

- **Treat sustainable export value chains as a core pillar of green trade.** Successful countries are shifting from a "single product" approach to a low-carbon value-chain perspective, where each link from production and processing to logistics and marketing is aligned with climate and social standards. UNCTAD (2023a) reports that more than 30 developing countries have integrated sustainable export value chains into their NDCs, particularly in timber and non-timber forest products, agriculture, eco-tourism and the ocean economy. These models not only reduce emissions but also create local jobs, empower women and improve resilience to climate change. For example, UNCTAD's Ocean Economy and Trade Strategy (OETS) allows small island developing states (SIDS) to exploit marine resources sustainably and develop seaweed farming, fisheries and coastal tourism. These sectors contribute to natural carbon sequestration and raise export value. Successful green value chains thus require not only natural-resource endowments but also coherent financial, technical and institutional policies and legal frameworks that ensure fair benefit-sharing among investors, enterprises and local communities.
- **Use technical regulations and green standards as the institutional backbone of sustainable trade.** Standards such as maximum emission thresholds, mandatory energy labels, low-carbon certification and eco-labelling help consumers identify green products and create incentives for technological innovation. However, their design and implementation must comply with WTO principles to avoid becoming disguised trade barriers. Developed countries often require imported products to meet low-carbon or sustainable-origin standards. This poses major challenges for developing exporters but also offers opportunities for those that standardise production early. Governments therefore need to build domestic technical-standards frameworks aligned with international rules and invest in testing, certification and traceability capacity so that domestic firms can integrate into global green supply chains instead of being excluded.
- For Viet Nam, a key lesson is that **green trade requires a supportive fiscal-financial architecture.** Tariff reform, green-FDI incentives, credit schemes, logistics investment,

carbon-pricing alignment and digital MRV systems are central to maintaining export competitiveness. Finance-planning ministries in successful economies lead the financial and regulatory reforms that enable firms to comply with CBAM, EUDR, PCF requirements and ESG disclosure.

Building a multi-layered green-finance system and testing innovative instruments

Experience from Korea, Japan and the EU shows that green finance succeeds when Government creates a coherent, sequenced financial architecture.

- **Reinforce the leading role of the state and create a coherent set of green-finance instruments to crowd in private capital.** Experience from the Republic of Korea and Japan shows that in the early stages of the green transition state leadership is decisive. Governments should actively use financial tools such as energy-transition funds, green and transition bonds, concessional credit and green-budget allocations as seed capital to reduce risk and build market confidence. This approach attracts private investment into low-emission sectors, clean technologies and green infrastructure. For Viet Nam the key lesson is to build a comprehensive green-finance toolkit that combines multiple resources, including budget allocations, green credit, green bonds, transition bonds and carbon markets. Viet Nam already has frameworks for green credit and green bonds; the next step is to introduce new instruments such as transition bonds, link use-of-proceeds criteria to the national taxonomy and establish unified impact-reporting standards to strengthen transparency and investor trust. The coordinated operation of these instruments will expand financing scale, improve access to medium and long-term capital for enterprises and facilitate green project deployment in key sectors such as energy, transport and urban development. This is crucial for both emissions reduction and the expansion of long-term green-growth opportunities.
- **Develop green-transition investment funds and mobilise medium and long-term finance for strategic projects.** Green-transition funds similar to Japan's GX Fund or the EU Innovation Fund should focus on financing or co-financing projects with high emissions-reduction potential but significant commercial risk, thereby addressing market gaps and enabling private participation in new sectors such as hydrogen, energy storage, green urban infrastructure and low-emission transport. Green and transition bonds should serve as core instruments for medium and long-term financing of energy, transport and green-urban programmes. Lessons from the Republic of Korea, Japan and the EU suggest that Viet Nam should adopt a proactive capital-market strategy linked to public-private investment roadmaps in priority sectors.
- **Introduce carbon pricing and develop carbon markets aligned with regional and international integration.** The EU ETS, CBAM and China's emissions-trading scheme demonstrate that carbon pricing is a central tool for steering emissions behaviour and generating revenue for climate policy. For Viet Nam, it is vital to operationalise a domestic carbon market, establish an MRV system that meets international standards and design a roadmap for pilot linkages with regional markets such as those in the

Republic of Korea and Singapore. Hybrid carbon-pricing mechanisms that combine environmental taxes with tradable carbon credits could optimise economic efficiency and reduce fiscal risks. Revenues from carbon pricing should be earmarked for renewable energy, green transport infrastructure and just-transition support for affected firms and workers.

- **Advance green fiscal policy and integrate climate objectives into the state budget.** OECD and Korean experience shows that green budgeting is essential for embedding climate goals throughout the fiscal cycle. Viet Nam can explore the OECD Green Budgeting Framework, with its pillars on institutions, methods, accountability, transparency and enabling environment. Over time this would support green budget tagging, annual green-budget reports and ex ante and ex post assessments of the climate impacts of public investment. In parallel, tax incentives, investment credits, accelerated depreciation and tariff exemptions for green technologies, renewable energy and electric mobility can stimulate private investment in low-emission sectors. In the long term Viet Nam could draw on Japan's model of a "green fiscal cycle" where revenues from carbon pricing and environmental fees are reinvested in green public programmes. This approach supports fiscal sustainability, enhances the effectiveness of public spending and strengthens the mobilisation of private capital.

A central lesson for Viet Nam is that green financial instruments must operate as part of a unified architecture. Green bonds, transition bonds, credit guarantees, climate funds and carbon markets need strong governance, unified reporting standards and fiscal-risk oversight. Countries that succeed integrate their green-finance systems with industrial strategy, aligning capital mobilisation with supply-chain development, technology upgrading and strategic-sector investment.

Ensuring fairness and inclusion in the transition

International experience shows that a sustainable green transition can only be achieved when fairness and inclusion are placed at the centre of policy design and implementation. Many countries such as Canada, EU members and Germany integrate three dimensions of justice, distributive, procedural and recognitional, into climate strategies and energy policies. This helps to ensure a reasonable sharing of the costs and benefits of transition across social groups, guarantees public participation in decision-making and protects vulnerable groups, including women, people living in poverty and Indigenous communities, from adverse impacts.

- **Design support mechanisms for workers in fossil-fuel sectors and regions dependent on high-emission industries.** Germany, South Africa and the EU have established Just Transition Funds to finance worker retraining, green-job creation and social-infrastructure investment in heavily affected regions. For Viet Nam this highlights the need to implement programmes for occupational transition, green-skills development and sustainable livelihoods for workers and local communities.

- **Ensure meaningful community participation.** Colombia and Nordic countries have developed extensive consultation mechanisms with citizens before approving renewable-energy or resource-extraction projects, particularly through FPIC-type procedures for Indigenous communities. Strengthening transparency, fostering dialogue among authorities, enterprises and residents and conducting social-impact assessments alongside environmental-impact assessments offer valuable lessons for Viet Nam as it expands large-scale renewable-energy and green-infrastructure projects.
- **Protect vulnerable groups through targeted support.** In energy-price and climate-fiscal policy advanced economies emphasise targeted support schemes. When introducing carbon taxes the EU and Canada have coupled them with social-assistance programmes such as energy-bill subsidies, energy-efficiency funds for low-income households and support for replacing equipment with greener alternatives. Viet Nam could consider recycling a portion of carbon-pricing revenue to mitigate impacts on poor households and small businesses and prevent widening inequality.
- **Mainstream gender equality.** Experience from OECD countries, Canada and Colombia demonstrates the importance of integrating gender equality and women's economic empowerment throughout the transition. Women often face higher risks in affected sectors due to limited access to skills, resources and employment opportunities. Green-skills training, credit support and micro-finance programmes should therefore explicitly prioritise women and other disadvantaged groups.
- **Strengthen social protection.** Many OECD countries underline the role of social-protection systems in cushioning "transition shocks". Expanding unemployment insurance, livelihood support and climate-responsive social-protection schemes has proven effective in shielding workers and communities from the socio-economic risks arising from decarbonisation. Viet Nam could assess regional and sectoral impacts to design more tailored social-protection measures.
- **Invest in green infrastructure and public services as a foundation for inclusive transition.** Countries such as Japan, the Republic of Korea and EU members show that expanding green public transport, improving access to clean energy in remote areas, promoting sustainable urban development and applying nature-based solutions generate both environmental and social-equity benefits. Guiding Viet Nam's public investment towards these areas will help ensure that all population groups can share in the benefits of the green transition.

For Viet Nam, the core lesson is that just-transition mechanisms require a fiscal strategy. Finance ministries lead carbon-revenue recycling, targeted household support, regional-adjustment funds, skills programmes and social-protection reforms. Without these measures, transition costs may fall disproportionately on poorer households and coal-dependent regions.

2. Positioning Viet Nam Within the Global Green Transition

2.1 Viet Nam's key strategies, legal frameworks, and policies for the green transition

2.1.1 Commitments to green growth and sustainable development

In the context of deep international integration and intensifying climate risks, Viet Nam has demonstrated a clear political will to participate in, implement and domesticate international commitments on green growth and sustainable development. These commitments not only signal Viet Nam's responsibility to the international community but also provide a crucial impetus for transforming the domestic growth model towards low emissions, a circular economy and enhanced climate resilience. **They are increasingly seen as a foundation for restructuring the economy, upgrading industrial capacity and safeguarding long-term prosperity.**

The Paris Agreement on Climate Change (2015)

The Paris Agreement, adopted at COP21 in 2015, sets the global objective of limiting the increase in average temperature to well below 2°C and pursuing efforts to restrict it to 1.5°C above pre-industrial levels. Viet Nam joined the Agreement with commitments to reduce greenhouse gas (GHG) emissions, strengthen adaptation and contribute climate finance to support other developing countries. These commitments reflect Viet Nam's sense of responsibility for the global effort to tackle climate change and provide a basis for reshaping national development strategies in a greener and more environmentally sustainable direction.

Commitment to Net Zero Emissions by 2050

At the United Nations Climate Change Conference COP26 Viet Nam announced its pledge to achieve net zero GHG emissions by 2050. This is a landmark commitment that places Viet Nam among the pioneering countries in Asia. The target is consistent with global trends, as more than 145 countries have announced or are considering net zero objectives. The European Union, the United Kingdom, Japan and New Zealand aim for 2050, while China has set its target year as 2060.

The net zero 2050 pledge is highly ambitious and will shape all climate-related strategies and policies in Viet Nam over the next three decades. "Net zero" does not mean stopping emissions entirely. It means that emissions released into the atmosphere will be balanced by absorption and removal through measures such as forest restoration, enhanced carbon sinks and the deployment of carbon capture and storage technologies. To realise this objective the Government has acted swiftly by issuing a series of important legal documents, strategies and action plans which together form an increasingly coherent regulatory framework. **This rapid response has been positively recognised by many development partners as evidence of Viet Nam's determination to move from political declarations to concrete implementation.**

Commitments at COP26 and Participation in Global Initiatives

At COP26, in addition to the overarching net zero pledge for 2050, Viet Nam joined the Global Methane Pledge, aiming to reduce methane emissions by 30 per cent by 2030. Viet Nam also signed the Glasgow Leaders' Declaration on Forests and Land Use, committing to promote sustainable forest management, halt forest loss and strengthen conservation. These initiatives underline Viet Nam's intention to address not only energy-related emissions but also those from agriculture, land use and forestry.

The Just Energy Transition Partnership (JETP)

Viet Nam has signed a Just Energy Transition Partnership (JETP) with a group of developed countries and international financial institutions, securing an initial support package of 15.5 billion USD to facilitate the shift from coal to clean energy. The JETP sets specific objectives:

- **Emissions peak**: Striving to reach peak power-sector emissions by 2030 (from 240 megatons to 170 megatons). which is five years earlier than the original plan.
- **Renewable energy**: Increasing the share of renewable energy in the power mix and gradually phasing down fossil fuels.
- **Emission reduction goals**: In its updated Nationally Determined Contribution (NDC), Viet Nam commits to reducing GHG emissions by 2030 by:
    - 15.8 per cent compared with the business-as-usual (BAU) scenario using domestic resources;
    - up to 43.5 per cent compared with BAU with sufficient international support.

The JETP provides a structured platform to mobilise concessional finance, private capital and technical assistance, **although its effectiveness will depend heavily on project selection, governance standards and the capacity to ensure a just transition for workers and communities currently dependent on coal.**

Viet Nam's Nationally Determined Contributions (NDCs)

- **Initial NDC (2015)**: In 2015 Viet Nam submitted its first Intended Nationally Determined Contribution to the UNFCCC Secretariat. It committed to reducing GHG emissions by 8 per cent by 2030 compared with the BAU scenario using domestic resources. The reduction could rise to 25 per cent with international support in the form of finance, technology transfer and capacity-building.
- **Updated NDC (2020)**: In the update submitted on 11 September 2020 Viet Nam increased its unconditional mitigation target to 9 per cent of total GHG emissions by 2030 compared with BAU (equivalent to 83.9 $MtCO_2e$), with the potential to reach 27 per cent with international support (250.8 $MtCO_2e$). This update marked a tangible strengthening of ambition.

- **Updated NDC (2022)**: On 8 November 2022 Viet Nam submitted a further updated NDC, reaffirming and significantly raising the level of effort to 2030. The country now commits to reducing GHG emissions by 15.8 per cent compared with BAU using domestic resources, and up to 43.5 per cent with international support. The NDC covers energy, agriculture, land use, land-use change and forestry (LULUCF), waste and industrial processes, with a particular focus on the energy sector which accounts for the largest share of national emissions. **The progressive tightening of NDC targets over time demonstrates Viet Nam's willingness to align its trajectory with the Paris temperature goals.**

2.1.2 Viet Nam's Strategies for Green Growth and Sustainable Development

In recent years Viet Nam has gradually built a relatively comprehensive policy architecture to operationalise international commitments on green growth, sustainable development and climate change. Commitments under COP21 and COP26, the updated NDCs and the JETP are being translated into specific strategies, action plans and national programmes. Collectively these documents form a policy framework that links strategy, planning and implementation while mobilising the participation of the political system, the business community and wider society.

National Green Growth Strategy for 2021-2030 with a Vision to 2050

The National Green Growth Strategy, issued under Decision 1658/QĐ-TTg (2021), provides an overarching direction for transforming Viet Nam's growth model. The Strategy's central aim is to green the economy in tandem with developing a circular-economy model, reducing GHG emissions intensity and strengthening climate resilience. The objectives span all three pillars of sustainable development: economic, environmental and social.

The Strategy sets out a series of quantitative targets for 2030 and 2050, including rates of collection and treatment of solid waste and urban wastewater, the modal share of public transport, the development of green and climate-resilient urban areas and the expansion of green infrastructure. It envisages restructuring the economy away from highly polluting sectors and towards green industries, clean technologies and resource-efficient production.

National Green Growth Action Plan for 2021-2030

The National Action Plan on Green Growth, issued under Decision 882/QĐ-TTg (2022), translates the Green Growth Strategy into 18 thematic areas, 57 groups of tasks and 134 specific activities. This document serves as the main "operational instrument" that enables consistent implementation from central to local levels.

The tasks range from institutional reform, human-resource development and science and technology to mobilisation of financial resources and sector-specific actions in energy, industry, construction, transport, agriculture, sustainable consumption, waste management and air quality. This cross-cutting approach clearly reflects the intention to green the entire

economy in line with international practice where green growth is mainstreamed in planning and sectoral strategies.

The Action Plan also identifies a diversified resource base for implementation, including the state budget, official development assistance, green credit, green FDI, green bonds and other social resources. This reflects a policy orientation towards sustainable climate finance that places greater emphasis on private sector engagement and green financial instruments.

National Climate Change Strategy to 2050

The National Climate Change Strategy, issued under Decision 896/QĐ-TTg (2022), sets the overarching objective of achieving net zero emissions by 2050 in line with Viet Nam's COP26 pledge. It emphasises two core goals:

1. Effective adaptation to climate change;

2. GHG mitigation following sectoral roadmaps, including explicit reduction pathways for energy, agriculture, forestry, waste and industry up to 2050.

The Strategy outlines a wide range of measures such as climate-resilient infrastructure, disaster-risk monitoring, climate-smart agriculture, forest protection and an upgraded meteorological and hydrological observation network. It also requires all sectors to conduct GHG inventories, develop national emission factors and establish an MRV system that meets international standards, which is a prerequisite for operating a domestic carbon market.

National Energy Strategy

The National Energy Strategy is articulated through several key Party and Government documents, notably:

- Resolution 55-NQ/TW of the Politburo (11 February 2020) on the orientation for national energy development to 2030 with a vision to 2045;

- Resolution 70-NQ/TW of the Politburo (20 August 2025) on ensuring national energy security to 2030 with a vision to 2045;

- Decision 500/QĐ-TTg (15 May 2023) approving the National Power Development Plan for 2021-2030 with a vision to 2050 (PDP8).

Key elements include:

- Promotion of renewable energy (RE)

    - Raising the share of RE in the generation mix to around 30.9-39.2 per cent by 2030 and 67.5-71.5 per cent by 2050.

- Prioritising wind power (onshore, near-shore and offshore), solar power (in particular rooftop solar for self-consumption), hydropower and biomass.
- Exploring new RE sources for export with an expected capacity of 5,000-10,000 MW by 2030.
- Developing regional RE industrial and service hubs in the north and south.

- Gradual phase-down of coal-fired power
  - No new conventional coal-fired projects in the 2021-2030 period, with most previously planned projects cancelled or converted to other fuels.
  - Phasing out coal-fired plants by 2050, with only a limited number potentially converted to biomass co-firing or combined with carbon capture technology.

- Other key directions
  - Investment in modern, smart transmission and distribution networks to integrate decentralised RE sources.
  - Ensuring adequate electricity supply to support targeted GDP growth of around 7 per cent per year for 2021-2030.

Programme to Support Sustainable Private-Sector Business (2022-2025)

Under Decision 167/QĐ-TTg (2022) Viet Nam has launched a programme to promote sustainable business practices in the private sector. The programme aims to foster a supportive ecosystem for green enterprises, encourage innovation in business models and enhance the contribution of private firms to the SDGs. One important objective is to raise labour productivity in the private sector by an average of 7 per cent per year, which reflects the intention to link green growth with efficiency and competitiveness. The programme also encourages firms to adopt ESG practices and disclose sustainability performance, which is increasingly required by global buyers and investors.

From the strategies, plans and programmes already in place, it is possible to draw several conclusions about the evolution of Viet Nam's policy framework for green growth and sustainable development.

- The policy system increasingly reflects a coherent strategic orientation that aligns with international commitments. National strategies on green growth, climate change and sustainable development are designed to be consistent with COP26 pledges and successive NDC updates. Viet Nam is clearly shifting towards a low-emission, circular and innovation-based growth model with a strong focus on climate adaptation. Integrating long-term net zero objectives, energy transition and sustainable urban development into national plans demonstrates strategic vision and policy consistency.

- The policy framework is systemic, cross-sectoral and supported by clear implementation tiers. The Green Growth Strategy and the Climate Change Strategy function as mutually reinforcing pillars that create a comprehensive policy architecture covering energy, transport, industry, agriculture and urban development. Responsibilities for ministries, agencies and local governments are clearly delineated, while inter-sectoral coordination is mandated to improve coherence and connectivity during implementation. This marks significant progress compared with earlier periods when green-growth policies were fragmented and coordination mechanisms were weak.

- Viet Nam is paying greater attention to resource mobilisation and implementation capacity, recognising these as foundations for the next phase of the green transition. Green financial instruments such as green credit and green bonds, together with plans for a domestic carbon market and a national MRV system, are being developed step by step. At the same time, private enterprises are encouraged to join green value chains and invest in cleaner technologies. The expansion of financial resources combined with strengthened institutions and governance will be critical for delivering the strategic objectives.

2.1.3 Key legal framework for the green transition in Viet Nam

In parallel with strategic documents, Viet Nam has been gradually establishing and refining a legal framework that supports green growth, sustainable development and the implementation of international climate commitments:

Law on Environmental Protection (2020)

The Law on Environmental Protection No. 72/2020/QH14, adopted on 17 November 2020 and effective from 1 January 2022, provides a key legal foundation for the green transition and introduces several important innovations:

- **Codifying the circular economy:** The Law gives a full legal definition of the circular economy, requires its integration into planning and development processes and encourages enterprises to adopt circular business models. This is broadly consistent with approaches in the EU, Japan and the Republic of Korea where the circular economy has become a core pillar of public policy supported by legislation, technical standards and incentives.
- **Laying the groundwork for a low-carbon economy**: The Law introduces provisions on climate change adaptation and mitigation, facility-level GHG inventories and mechanisms for emission allowance trading and carbon-credit exchange. These provisions establish a legal basis for a domestic carbon market similar in spirit to those already operating in China, the Republic of Korea and the EU. However, in comparison

with OECD countries, Viet Nam's MRV system is still under development and not yet fully standardised to the level of the EU ETS or the Korean Emissions Trading Scheme.

- **Promoting green technological innovation:** The Law sets requirements on emission reduction and waste management and encourages the adoption of clean technologies. This creates incentives for enterprises to shift towards low-carbon production models that align with global trends and the increasingly stringent environmental standards of international supply chains.

The 2020 Environmental Protection Law therefore represents a significant step towards international best practice, although implementation capacity, financial resources and enforcement remain weaker than in advanced economies.

Land Law (amended 2024)

The amended Land Law, adopted on 18 January 2024 and effective from 1 January 2025, integrates ecological conservation and efficient resource use more deeply into land governance. It includes several pillars closely linked to the green transition:

- **Integrating climate change into land-use planning:** The Law requires land-use plans to respect natural conditions, support climate-change adaptation and protect water resources while delivering environmental and social objectives. This approach is analogous to ecosystem-based land-use planning in the EU, Japan and New Zealand.
- **Provisions on land restoration and ecological conservation:** The Law introduces rules for rehabilitating degraded, eroded and polluted land, which is consistent with global land-restoration policies aimed at enhancing carbon sequestration and protecting ecosystems.
- **Land for waste treatment and environmental infrastructure:** Dedicated land is reserved for waste-treatment facilities and environmental infrastructure, reducing pollution pressure and supporting the development of circular-economy systems.
- **Multi-purpose land use and resource optimisation:** The Law allows agricultural land to be combined with eco-tourism, promotes land consolidation for high-tech agriculture and encourages more efficient land use based on sustainability principles. This is similar to approaches in Japan and the Republic of Korea, where flexible land management supports green transition, smart agriculture and rural development.

The 2024 Land Law is thus progressive in terms of conservation and efficient resource utilisation. It strengthens land-management effectiveness and environmental protection in line with sustainable-development goals. Nevertheless, compared with leading jurisdictions such as the EU and Japan, Viet Nam still lacks mature green-finance mechanisms linked to land (for example land-based carbon taxes or incentives for ecological restoration) and a fully integrated digital land-information system for monitoring land use.

Green Transition Provisions in Sector-specific Laws

Elements of the green transition are also embedded in several sectoral laws, including:

- **Planning Law (2017):** Requires the integration of environmental, climate and sustainable-development objectives into national, regional and provincial planning.
- **Law on Economical and Efficient Use of Energy (2010), as amended in 2025**: The amending Law No. 77/2025/QH15 revises 19 articles and adds one new article. It specifies obligations for designated energy-using enterprises and introduces minimum energy-performance standards (MEPS). The amendments, adopted on 18 June 2025 and effective from 1 January 2026, create new policies such as an energy-efficiency fund, support for ESCO services and financial, fiscal and land-use incentives for energy-saving projects while simplifying administrative procedures. This is an important step towards meeting emission-reduction targets and improving energy efficiency.
- **Amended Electricity Law (2024):** The law provides a framework for electricity development in Vietnam. The revised Electricity Law, adopted at the end of 2024 and effective from 1 February 2025, introduces DPPA mechanisms, prioritises renewable power such as wind and solar, and encourages private investment in transmission networks. Decree 58/2025/NĐ-CP, effective from 3 March 2025, sets out detailed implementing provisions that address several institutional bottlenecks in project development.
- **Law on Forestry (2017) and Law on Water Resources (2023):** These laws underpin carbon sequestration, REDD+ and payment for forest environmental services (PFES) and provide a legal basis for managing climate-related risks linked to water resources.
- **Decision No. 876/QD-TTg** : The Prime Minister issued Decision No. 876/QD-TTg dated July 22, 2022 approving the Action Program on green energy conversion, carbon and methane emission reduction of the transport sector program for ministries, branches and localities to implement the goals of developing a green transport system towards the goal of net greenhouse gas emissions of "0" by 2050.

2.2 Current state of the green transition in Viet Nam

2.2.1 Green Competitiveness

Green competitiveness refers to a country's ability to secure economic advantages by meeting and surpassing environmental, social and governance standards in production and supply chains. For Viet Nam, a highly open and export-oriented economy, enhancing green competitiveness is not only an environmental concern but also a vital condition for overcoming emerging green technical barriers such as the EU Carbon Border Adjustment Mechanism and for attracting high-quality FDI.

Objectives for Strengthening Green Competitiveness

Viet Nam has set clear goals for integrating environmental considerations into its growth model to bolster competitiveness in the medium and long term. On mitigation, Viet Nam aims

to reduce GHG emissions intensity per unit of GDP by at least 15 per cent by 2030 and 30 per cent by 2050 compared with 2014, while promoting renewable energy and the circular economy. In terms of SDGs Viet Nam prioritises objectives relating to clean energy, sustainable production and climate adaptation and seeks to mobilise climate finance through cooperation mechanisms with development partners.

At the enterprise level Viet Nam is focusing on enhancing firms' capacity to adopt clean technologies, digital solutions including artificial intelligence and ESG management practices. This is intended to deepen participation in global value chains, reduce long-term operating costs and meet buyers' sustainability requirements. In practice, an increasing number of export-oriented firms in sectors such as textiles, electronics and agriculture are beginning to disclose emissions data and align with international certification schemes, although capacity gaps remain considerable for small and medium-sized enterprises.

Global Sustainable Competitiveness Index (GSCI)

According to the 2023-2024 Global Sustainable Competitiveness Index (GSCI) published by SolAbility, Viet Nam scored 49.76 points, an increase of 3.48 points compared with 2023, and ranked 38th globally. Viet Nam stood second in ASEAN after Singapore and above the regional average.

Viet Nam's main strengths lie in intellectual capital (54.45 points), social capital (49.37 points) and economic sustainability (51.33 points), which indicates strong potential for a green transition based on human resources, social stability and positive economic growth. However, Viet Nam still faces challenges in resource efficiency (43.98 points) and natural capital (47.35 points), reflecting high energy consumption and pressure on ecosystems.

In terms of governance quality Viet Nam scored 52.06 points, above the ASEAN average yet below some regional peers such as Singapore and Malaysia. More specifically:

- Viet Nam outperformed the ASEAN average of 44.32 points and surpassed countries such as Malaysia (46.64 points) and Thailand (45.45 points).

- Strengths are concentrated in intellectual capital, social capital and economic sustainability.

- Resource efficiency and natural capital remain weaker than in some neighbouring countries with richer natural endowments such as Cambodia and Lao PDR.

- Governance effectiveness at 52.06 points is higher than the ASEAN average (50.41 points) but still trails Singapore (54.96 points) and Malaysia (52.51 points).

Assessment of Green Competitiveness at the Sub-national Level

Green competitiveness also manifests at provincial level and can be observed through domestic indices such as the Provincial Competitiveness Index (PCI) and the Provincial Green Index (PGI).

The median PCI score in 2024 reached 67.67 points, indicating a generally transparent and enabling business environment which is fundamental for firms to comply with green standards.

The PGI helps provincial authorities assess and improve the quality and effectiveness of environmental governance. It comprises four component indices:

1. Reduction of environmental pollution and negative impacts of climate change;
2. Compliance with minimum environmental standards;
3. Leadership of provincial authorities in promoting green practices;
4. Policies and support services for enterprises in environmental protection.

A province is considered to have good environmental governance when it actively prevents and reduces pollution and climate risks, enforces regulations in a way that ensures compliance without imposing excessive burdens on enterprises and provides guidance, awareness-raising and incentives for green practices including green public procurement. PGI results for 2024 show that Hai Phong ranked first overall with a total score of 29. It was followed by Vinh Long (28.16 points), Ha Nam (28.04 points), Bac Ninh (27.78 points) and Binh Duong (27.64 points). These results suggest that industrial and port cities can become frontrunners in green governance when they align environmental management with investment attraction and urban development strategies. Viet Nam therefore possesses a number of advantages for strengthening green competitiveness, particularly a relatively clear policy framework, improving sustainable-competitiveness performance in international rankings, a stable business environment and the ability to attract higher quality FDI.

However, constraints remain. Energy efficiency is still low, dependence on imported green technology is significant and implementation capacity varies widely across provinces. Growing ESG requirements from international markets are creating additional compliance pressures. In the context of expanding green trade barriers Viet Nam needs to continue investing in technological upgrading, develop coherent national Development of a green equity market has been embedded in sectoral regulations:

- The Securities Law 2019 sets out rules for issuance, listing, trading, disclosure, investor protection and market organisation, providing a legal foundation for sustainable financial products such as green bonds, transition bonds and ESG equities, and enabling the incorporation of environmental, social and governance disclosure in corporate reporting.

- Decree 153/2020/NĐ-CP and its amendments (Decrees 65/2022/NĐ-CP and 08/2023/NĐ-CP) govern private corporate bond offerings, tighten issuance conditions and enhance transparency of use of proceeds and disclosure.
- Circular 96/2020/TT-BTC regulates information disclosure on the stock market and requires listed companies to include sustainability information in annual reports.
- Decision 21/2025/QĐ-TTg on the National Green Taxonomy sets criteria and verification mechanisms for green projects in seven priority sectors, forming a basis for classifying green financial products.

Since 2017 the Ho Chi Minh City Stock Exchange (HOSE) has operated the VNSI index, which selects around 20-25 VN100 companies with the best ESG practices. VNSI serves as a benchmark for some funds and ETFs, thereby directing long-term capital towards sustainable firms. Around 50-55% of VN100 companies now publish sustainability reports in line with Circular 96, and the proportion is rising.

In recent years the State Securities Commission has worked with IFC, GIZ and other partners to develop a national ESG disclosure framework, aiming to converge with ISSB/IFRS S1-S2 standards for large listed companies from 2026-2027 onwards. This places Viet Nam among emerging markets that are moving relatively early on ESG regulation compared with many countries at a similar income level.

2.2.2 Investment for the green transition

Investment needs for the green transition in Viet Nam

Viet Nam has identified four key objectives for green growth and green investment: reducing the greenhouse-gas emissions intensity of GDP, greening economic sectors, greening lifestyles and promoting sustainable consumption, and greening the transition itself on the principles of equity and enhanced resilience.

The World Bank estimates that Viet Nam will require about 368 billion USD in the period 2022-2040, equivalent to roughly 6.8% of GDP per year, to build climate resilience and decarbonise its economy in line with a net-zero pathway. This figure is significantly higher than the current level of resources mobilised from the state budget, official development assistance and the domestic private sector. Calculations by the Ministry of Planning and Investment (now the Ministry of Finance) and BCG suggest that a further 144 billion USD will need to be mobilised in 2021-2050, equivalent to around 2.2% of GDP, in order to deliver on the commitment to reach net zero emissions by 2050.

In South-East Asia as a whole, clean-energy investment has so far accounted for only about 2% of global clean-energy investment, despite the region representing roughly 5% of global energy demand. This indicates that Viet Nam is not alone in facing a shortage of green capital, yet without effective policies there is a real risk of a “high-commitment, low-capital” situation, where ambitious pledges are not matched by actual investment.

Financing for green growth is expected to come from several main sources. The first is external support, including the JETP package of 15.5 billion USD. The second is foreign direct investment, with plans to attract annual FDI disbursements of around 20-30 billion USD in 2026-2030 and 30-40 billion USD per year in 2031-2040. To increase such inflows Viet Nam is shifting from broad-based FDI attraction towards a more selective, quality-oriented approach that prioritises green, high-value and low-carbon investment. The third source is domestic capital, both public and private, including medium-term public investment which plays a catalytic role in crowding in private finance. Viet Nam is currently among the ten largest recipients of green investment worldwide, accounting for about 5% of green investment in developing countries, with renewable energy as the dominant sector and investment in this field increasing by a factor of 5.7 over the past decade.

Green Public Investment

Investment for the green transition is currently channelled mainly through public investment programmes in energy, climate-resilient infrastructure, transport and urban development. These investments are closely linked to key strategic documents such as the National Green Growth Strategy, the National Climate Change Strategy and Power Development Plan VIII. Together they provide an important orientation framework that directs budgetary capital towards projects that reduce emissions, strengthen resilience and promote a low-carbon development model.

Climate Public Expenditure and Investment Reviews (CPEIR) and the Country Climate and Development Report (CCDR) conducted by the World Bank and UNDP note that the share of climate-related spending in total state expenditure has increased. However, the overall level of investment remains low relative to the estimated needs and is fragmented across many programmes, projects and line ministries. This suggests that although the State plays a significant role in green investment, the scale is still insufficient to meet long-term transition requirements.

The Government must also allocate sizeable resources to meet investment needs under Power Development Plan VIII and related energy-infrastructure programmes. Reuters estimates that total capital requirements for power capacity development to 2030 will be around 136 billion USD, including expansion of renewable energy, and upgrading of transmission networks. In this context, the state budget together with ODA and concessional loans from international financial institutions such as the World Bank, ADB, JICA and KfW act as crucial “seed capital”. However, the degree of leverage on private investment remains limited and has yet to generate sufficiently large crowd-in effects.

Overall, green public investment in Viet Nam has been integrated into a wide range of national strategies, plans and targeted programmes, reflecting considerable governmental effort to orient the economy towards a green transition. Yet three major challenges persist:

- The current volume of investment is still far below the needs estimated by international institutions.
- Public resources remain heavily dependent on foreign concessional finance.
- There is no centralised financial mechanism, such as a dedicated “climate bank” or strong national green fund, capable of coordinating, attracting and multiplying private capital.

These constraints underline the need for Viet Nam to further develop its green-finance institutions, strengthen investment-support instruments and diversify financing models in the coming years.

Private Investment

According to the report “Green Economy in South-East Asia”, private-sector green investment in Viet Nam in 2024 is estimated at around 160-161 million USD, equivalent to roughly 2% of total green investment in the SEA-6 group (Indonesia, Malaysia, the Philippines, Singapore, Thailand and Viet Nam). This figure also represents a decline of about 19% compared with 2023, reflecting a slowdown in private capital flows into green projects amid global economic and financial volatility.

These results show that Viet Nam has begun to form a stream of “labelled green” private capital that meets regional and international standards, rather than focusing solely on conventional energy or infrastructure projects. The emergence of investments formally recognised as green marks an important step in standardising the domestic green-finance market and in aligning with independent evaluation criteria for projects and firms.

However, when measured against the size of the economy and the investment needs of the green transition, annual private green investment of 160 million USD remains very modest. Compared with the overall requirement of 368 billion USD by 2040 estimated by the World Bank, private capital currently accounts for only a tiny fraction. This suggests that domestic private actors remain cautious about participating in green projects due to perceived high risks related to technology, markets and pricing mechanisms, long payback periods, and limited availability of incentives, risk-sharing instruments or cost-sharing schemes from the State.

In sum, private green investment in Viet Nam has improved in quality as transactions are increasingly classified according to international green standards, yet participation is still limited in scale and does not match the economy’s potential or transition needs. This highlights the necessity of refining incentive policies, expanding risk-mitigation tools, enhancing transparency of green-taxonomy criteria and encouraging stronger engagement by the financial and banking sector to provide a more powerful stimulus for private participation in the green transition.

Foreign Direct Investment

As the green transition becomes a dominant driver of global capital flows, Viet Nam has emerged as a promising destination thanks to its strong commitments at COP26, the 2050 net-zero target and ongoing efforts to完善 the policy framework for green growth. These factors build confidence among international investors, especially in renewable energy, clean technology and sustainable manufacturing. At the same time, Viet Nam's ambition to restructure its economy towards a low-carbon model creates substantial space for FDI into projects that meet green criteria.

FDI inflows to Viet Nam continue to grow and show a trend towards higher quality. Data from the General Statistics Office indicate that disbursed FDI in the first nine months of 2025 reached about 18.8 billion USD, an increase of 8.5% year on year, while total newly registered and additional FDI in the first ten months amounted to 31.52 billion USD, up 15.6%. Within this structure, investment in renewable energy, clean-energy equipment manufacturing, green transport and waste treatment is on the rise, consistent with sustainable-development objectives. In 2017-2021 Viet Nam attracted around 9 billion USD of FDI into green sectors, and in 2021-2024 alone total renewable-energy investment reached about 12.5 billion USD, illustrating the strong potential of this field.

Renewable energy accounts for the largest share of green FDI. Viet Nam currently has around 16.5 GW of solar power and 11.8 GW of wind power installed capacity, making it one of the fastest-growing renewable-energy markets in South-East Asia. Major international companies such as CIP, Ørsted, T&T, Sumitomo and several green investment funds are exploring or preparing multi-billion-dollar offshore wind projects. Viet Nam also has significant natural advantages, with around 40% of its land area having wind speeds suitable for wind-power development. Alongside energy, green industrial projects such as LEGO's carbon-neutral factory in Binh Duong are emblematic of the shift towards greening global supply chains.

Despite this potential, attracting green FDI still faces challenges. Some studies note that renewable-energy investment has slowed since 2022 owing to changes in feed-in tariff (FIT) mechanisms, delays in adopting competitive auction frameworks and constraints in the transmission grid. Reuters (2025) warns of risks to about 13 billion USD of wind and solar projects due to legal and regulatory bottlenecks. In addition, the absence of a fully operational national green taxonomy, limited dedicated financial incentives and relatively weak technological capacity among domestic enterprises hinder the diffusion and absorption of green technologies from FDI projects.

Blended Finance

Viet Nam is gradually implementing the Just Energy Transition Partnership (JETP), a major international cooperation initiative announced in December 2022 between the Government of Viet Nam and the International Partners Group (IPG) comprising the G7 countries and the European Union. The main objective of JETP is to help Viet Nam accelerate the transition from

fossil-fuel-based power generation to renewable energy in a sustainable, inclusive and just manner.

The initial JETP commitment amounts to 15.5 billion USD over three to five years, with 50% expected from partner governments and 50% from the private financial sector through the support of the Glasgow Financial Alliance for Net Zero (GFANZ). Of this total, 7.75 billion USD is to be mobilised by the IPG as concessional finance compared with current market terms, and at least 7.75 billion USD is to be raised by GFANZ for direct support to enterprises through investments by financial institutions and international corporations.

JETP in Viet Nam is guided by five core principles: transparency, effectiveness, equity, institutional strengthening and innovation. Resource mobilisation and allocation are to be publicly disclosed and closely monitored, with priority given to projects that have high emissions-reduction potential and generate socio-economic benefits. A key emphasis is on ensuring a just transition, particularly through retraining workers in the coal sector, safeguarding livelihoods in affected communities and promoting green growth in transition regions.

By 2025 three projects had completed financing agreements with the IPG under JETP:

1. A loan of 67 million EUR between EVN NPT and AFD for a 500 kV transmission line in Ho Chi Minh City and Dong Nai.

2. A loan of 480 million EUR between EVN and six IPG financial institutions for the 1,200 MW Bac Ai pumped-storage hydropower project, accompanied by 10 million EUR in technical assistance from the EU.

3. A loan of 65 million EUR between EVN and KfW for the 200 MW Tri An hydropower expansion.

Of the initial seven priority projects, four remain under financial negotiation. Among 25 newly proposed projects, 17 have been identified as consistent with the four JETP principles, with total capital needs of about 5.52 billion USD. In total, 24 projects are currently considered aligned with JETP with combined investment requirements of roughly 7.04 billion USD.

On 1 July 2025 the Ministry of Industry and Trade officially launched the JETP Information Portal, a concrete step in fulfilling commitments with the IPG on emission reduction and clean-energy development. The portal will publish project progress, financing mechanisms, policy dialogues and capacity-building and communication activities related to the energy transition in Viet Nam. It is expected to provide a transparent platform through which enterprises, international organisations and citizens can follow and engage with the country’s journey towards the 2050 net zero goal.

2.2.3 Finance for the green transition in Viet Nam

Green Fiscal Policy

Green fiscal policy refers to the use of budgetary instruments, tax and fee policies and financial incentives to steer the economy towards a low-carbon pathway and greater climate resilience. In recent years Viet Nam has begun to assemble a set of green fiscal tools, including the environmental protection tax, tax incentives for renewable energy and public investment for climate adaptation. However, the scale and consistency of these measures still fall short of what is required given the level of climate risk and the estimated financing needs. The World Bank's Country Climate and Development Report estimates that Viet Nam lost around 3.2% of GDP in 2020 due to climate impacts and could lose 12-15% of GDP annually by 2050 without strong mitigation and adaptation measures.

On the revenue side, the main green fiscal instrument is the environmental protection tax (EPT) on petrol, diesel and certain coal products. According to the OECD Economic Survey 2025, Viet Nam has not yet introduced a dedicated carbon tax but relies on EPT and some excise taxes on fossil fuels. Current rates are not designed in proportion to carbon content, so price signals for emission-intensive activities remain weak. EPT was cut by half from 2023 to help contain inflation, reducing revenue from about 0.54% to 0.41% of GDP, and this reduced rate has been extended until the end of 2025. The OECD recommends restoring pre-crisis rates from 2026, restructuring taxes to reflect carbon content, gradually increasing coal taxation and aligning diesel tax with petrol to match relative CO_2 emissions.

In parallel, Viet Nam offers various corporate income tax and import-duty incentives to encourage green investment. New projects in renewable energy, clean energy, environmental protection and certain socially oriented environmental activities enjoy a preferential corporate tax rate of 10% for 15 years, exemption for up to four years and a 50% reduction for the subsequent nine years. Import duties on environmental technologies are also reduced. However, the OECD notes that the overall volume of "tax expenditures" in Viet Nam, including VAT reductions, EPT cuts and extensions of other taxes, has grown while transparency and evaluation of their effectiveness remain limited. It therefore recommends publishing more information on the budgetary cost of these incentives and systematically comparing them with achieved outcomes.

On the expenditure side, climate-related public spending remains modest relative to needs. The first CPEIR for Viet Nam estimated that climate-related expenditure in 2010-2013 was only about 0.1% of GDP, focused mainly on irrigation and transport infrastructure to enhance resilience. The 2022 CCDR reports that state capital investment for climate-related projects, primarily adaptation, is around 1.5% of GDP, equivalent to roughly 25% of public investment, while spending on disaster prevention and response is about 0.3% of GDP. Financial-development assessments suggest that Viet Nam plans to maintain adaptation spending at around 1.5% of GDP per year to 2030 but will still need to mobilise an additional 27-64 billion USD from non-budget sources in 2021-2030.

Although the scale of climate spending has risen, Viet Nam's green-budgeting framework remains in an early stage. Updated CPEIRs for 2016-2020 supported by UNDP show that some ministries have begun to introduce climate-budget tagging, yet this has not become a routine practice across the entire budget cycle. Methods for classifying climate-related expenditure are not harmonised and rely largely on manual review of individual programmes and projects. By contrast, OECD countries at the forefront of green budgeting use it as a standard tool for budget preparation, allocation, monitoring and evaluation, combining climate-budget tagging, environmental impact assessment of spending and environmental tax reform. Compared with this benchmark, Viet Nam is still at a pilot stage and lacks a robust legal and institutional framework to integrate climate objectives into its medium-term fiscal framework.

Overall, Viet Nam's green fiscal policy exhibits several notable strengths. Viet Nam was relatively early in introducing the environmental protection tax and had begun to raise rates before temporarily cutting them in response to inflation, providing a foundation for evolving the tax into a more effective carbon-pricing instrument. The share of public investment dedicated to climate resilience has risen and is not low by international standards for countries at similar income levels. Tax incentives, land-use concessions and import-duty reductions for renewable-energy and environmental projects have helped attract additional private green investment.

However, public climate expenditure remains small compared with both the economic losses already incurred (3.2% of GDP in 2020) and the financing required for a low-carbon, climate-resilient development pathway. The green-budgeting framework is still fragmented with no unified classification and database, making it difficult to assess the effectiveness of each "green" đồng spent or to link spending to NDC commitments and net-zero targets. Heavy reliance on tax incentives may erode the revenue base and may not yield efficient trade-offs without detailed impact assessment.

Green financial policies

In terms of policy design, Viet Nam is among the developing countries that have established a relatively comprehensive framework for green growth and green finance:

- The Green Growth Strategy 2021-2030 (Decision 1658) and the associated Action Plan (Decision 882) explicitly identify the role of finance, banking and capital markets in mobilising resources for the green transition.

- The 2020 Environmental Protection Law and Decree 08/2022 provide a legal basis for economic instruments, particularly for carbon pricing and green bonds.

- The Green Banking Development Scheme (Decision 1604, revised 2024) and Circular 17/2022/TT-NHNN require credit institutions to manage environmental and social risks in lending, with the objective that by 2025 all institutions must have internal regulations in place.

- The National Green Taxonomy (Decision 21/2025/QĐ-TTg) lists 45 categories of green projects across seven sectoral groups, a critical step in standardising the definition of "green projects".

- In capital markets, the Securities Law 2019, the Securities Market Development Strategy to 2030 (Decision 1726) and regulations on sustainability reporting (Circular 96/2020/TT-BTC), together with the VNSI index and the State Securities Commission's guidance on green bonds, establish an institutional foundation for green, social and sustainability (GSS) securities.

Digital transformation in the banking sector has advanced rapidly. Many banks report that more than 90% of customer transactions are conducted via digital channels, the share of adults with bank accounts is around 85-87% and non-cash transactions are growing by over 50% per year. This provides a favourable basis for deploying digital green-finance products, ESG-based credit scoring and near-real-time monitoring of green-capital use.

Taken together, Viet Nam is ahead of many lower-middle-income countries in having a national green-growth strategy, a green taxonomy, a legal framework for green banking and a roadmap for a carbon market, whereas in many peer economies these elements remain fragmented or only at the level of general orientation.

Green credit policy

Development of green banking

Decision 1604/QĐ-NHNN of 7 August 2018 on the Green Banking Development Scheme marked a clear strategic direction for the banking sector. The roadmap comprises two phases, 2018-2020 and 2021-2025. The objective for 2025 is that all banks will have internal regulations on environmental and social risk management in lending, will systematically assess such risks for all credit activities, will apply environmental standards to funded projects and will integrate environmental risk into credit-risk assessment. At least 10-12 banks are expected to have dedicated units for environmental and social risk management, and around 60% of banks should have accessed green funding sources and implemented green-credit programmes.

To date 58 credit institutions report outstanding green loans, compared with only 15 institutions in 2017. Of these, 57 institutions conduct environmental and social risk assessments, with total outstanding green loans reaching around 3.62 quadrillion VND, more than 15 times the level recorded in 2017.

Green credit

According to the State Bank of Viet Nam, by the first quarter of 2025 outstanding green credit amounted to about 704-730 trillion VND, representing around 4.3% of total credit to the economy, with average growth of over 21% per year in 2017-2024, higher than overall credit

growth. However, the 4.3% share remains low compared with some ASEAN countries where green credit accounts for around 8-10% in Thailand and over 12% in Malaysia, depending on definitions and reference years. This indicates that although the absolute scale is increasing rapidly, the “greening” of the banking system’s balance sheet is still modest.

Green loans are concentrated mainly in renewable energy and energy efficiency (around 37-45% of outstanding green credit) and in green, high-tech agriculture (around 29-31%). The remainder is allocated to clean water, waste treatment, green transport and climate-resilient infrastructure.

Linking digital and green transformation in banking

Electronic payments, eKYC and digital identity systems such as VNeID reduce transaction costs and expand access to credit, especially for households and small businesses investing in green production models. Many banks, including Vietcombank, BIDV, MB, Techcombank and VPBank, have deployed AI, big data and robotic process automation in risk management and can in future integrate ESG indicators and data on energy consumption and emissions into credit-scoring models. The banking sandbox (Decree 94/2025) allows experimentation with green fintech solutions, credit scoring based on non-financial data and platforms that link banks with carbon-credit systems and IoT-based energy-consumption monitoring.

Compared with many developing countries, Viet Nam’s high level of banking digitalisation (over 90% of transactions via digital channels) and relatively broad account ownership provide a strong advantage for extending green finance to smaller clients in remote areas. This helps avoid the pattern observed in some markets where green finance is concentrated only in large “flagship” deals.

Challenges in developing green credit

Implementation remains uneven. Some credit institutions, including foreign banks, have not yet reported to the State Bank or have no green-credit portfolio. Although there is still significant room to expand, results to date remain limited. The main reasons lie in three areas:

1. An incomplete legal framework for green credit.

2. Limited tools for risk assessment while green projects typically involve long payback periods and uncertain financial returns.

3. Difficulties in mobilising resources, particularly international green finance.

Managing human resources is also increasingly challenging as bank staff need specialist expertise in environmental, social and climate issues to identify, appraise, monitor and supervise loans and to advise clients on meeting emerging international standards on emissions and sustainability. Many commercial banks are uncertain about which projects qualify for green-credit programmes, which borrowers are eligible for preferential terms and how to define the list of green economic activities that should be prioritised.

Green, social, and sustainability bonds (GSS bonds)

Between 2016 and 2024 total issuance of green, social and sustainability bonds in Viet Nam is estimated at around 1.1-1.4 billion USD, equivalent to 33-35 trillion VND, which is very modest compared with the size of the domestic capital market and with regional peers. In 2024 alone, however, the market showed strong momentum with total GSS issuance of about 6.9-7 trillion VND, an increase of roughly 171% compared with 2023, across four main deals by banks and infrastructure or water-utilities companies.

In 2024 total GSS bond issuance reached 6,875 billion VND, up 171% year on year. In 2025 notable transactions included 3,000 billion VND of green bonds from HDBank, 3,500 billion VND from SeABank and 317 billion VND from Hoa Binh Xuan Mai Water Supply. The average maturity has been above eight years, with coupon rates of around 5-6% for banks and 3-8% for non-financial corporates.

These issuances adhere to ICMA's Green Bond Principles, benefit from international second-party opinions and have attracted major institutional investors such as Eastspring Vietnam, AIA and Manulife, demonstrating growing investor confidence in Viet Nam's green financial products.

Nevertheless, in the context of the global green-bond market with over 2.6 trillion USD in outstanding volume and annual issuance exceeding 440 billion EUR in 2024, as well as regional markets such as Thailand with cumulative issuance of around 10-15 billion USD and sizeable markets in Malaysia and Indonesia, Viet Nam's green-bond market remains relatively small.

On the positive side, Viet Nam's market is growing rapidly, its standards are aligned with international norms and multilateral institutions such as the World Bank, IFC and ADB are actively supporting issuance and ensuring the quality of green bonds by major banks.

ESG equities and sustainability indices

Development of a green equity market has been embedded in sectoral regulations:

- The Securities Law 2019 sets out rules for issuance, listing, trading, disclosure, investor protection and market organisation, providing a legal foundation for sustainable financial products such as green bonds, transition bonds and ESG equities, and enabling the incorporation of environmental, social and governance disclosure in corporate reporting.
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2.2.4 Production transition along green value chains

Role of industry and clean energy in the 2030 development objective

Viet Nam aims to become an industrialised nation in a modern direction by 2030, with green industry and clean energy playing central roles. According to the Ministry of Finance, GDP growth in 2025 is projected at 8.5%, confirming a strong post-pandemic recovery. The economic structure is shifting positively, with industry and services accounting for about 80.5% of GDP. Within this context the energy sector, as the backbone of productive activity, is undergoing a profound transformation towards greener and more sustainable patterns, thereby driving modernisation of the broader economy.

Growth of renewable energy and expansion of industrial infrastructure

The share of renewable energy in national electricity supply has risen rapidly from 4.9% in 2020 to around 15% in 2025, a threefold increase. Wind, solar and biomass power are gradually replacing fossil-fuel sources, reflecting Viet Nam’s strong determination to move towards a low-carbon economy. Meanwhile the total area of industrial parks nationwide has expanded from 117,300 hectares in 2020 to 140,000 hectares in 2025, providing new development space for clean industry, supporting industries and high-tech sectors.

Viet Nam is focusing on improving production efficiency, optimising processes and using energy more sustainably. Greening traditional industries lays an important foundation for emerging sectors such as green steel, sustainable construction materials and high-tech industries including semiconductor manufacturing. The production of green and low-emission goods opens up access to demanding yet lucrative markets, particularly the EU, where the Carbon Border Adjustment Mechanism is being phased in.

Roadmap for green transition in industrial production

In the short term Viet Nam prioritises optimisation and electrification of production processes and pilots CCUS in high-emitting sectors such as cement. In the medium and long term the roadmap will extend to steel, chemicals and other heavy industries, while encouraging businesses to adopt low-carbon production methods. One example is the use of direct-reduced-iron technology combined with electric-arc furnaces in steel production, which can considerably reduce emissions. These steps are critical to enhancing the competitiveness of Vietnamese industry in global value chains.

Challenges for green-industry development

Despite positive developments, green-industry expansion faces significant challenges. High initial investment costs for technology, infrastructure and process upgrades place considerable pressure on enterprises, especially small and medium-sized ones. Procuring advanced equipment, training skilled staff and retrofitting existing facilities require large capital outlays.

Access to finance remains constrained. Many firms struggle to raise funds due to small scale, limited collateral or inability to meet banks' green-risk assessment criteria. At the same time there is a shortage of highly skilled workers with expertise in green technologies, which hampers the operation and maintenance of green industrial systems.

Awareness of green industry across society is uneven. Some businesses and consumers still underestimate the long-term benefits of sustainable production and consumption, which delays the shift in business models. Many companies lack knowledge of green technologies or encounter difficulties when integrating new technologies into existing production lines.

The competitiveness of green enterprises is not yet strong. High production costs mean that green products are often more expensive and less attractive than conventional alternatives, and markets for green products remain limited, reducing incentives for firms to invest.

To promote economic growth based on green industry Viet Nam will need coherent and sustained policies that support technological innovation, resource efficiency and emission reduction, while expanding domestic and international markets for green products and ensuring that industrial upgrading is aligned with broader social and environmental objectives.

2.2.5 Carbon market development

In recent years, the carbon market has become an increasingly important component of Viet Nam's greenhouse gas (GHG) mitigation policy, closely linked to the national commitment to achieve net zero emissions by 2050. The process of establishing this market has been driven by key legal instruments such as the 2020 Law on Environmental Protection, Decree No. 06/2022/NĐ-CP and the Scheme on Development of the Carbon Market approved under Decision No. 01/2022/QĐ-TTg.

Although implementation is gradually being strengthened, Viet Nam's carbon market remains at an early stage, with efforts focussed primarily on completing the legal framework, building data infrastructure and piloting crediting and trading mechanisms.

Initial development of the legal and institutional framework

Viet Nam has now laid the basic legal foundations for a domestic carbon market. The 2020 Law on Environmental Protection, for the first time, clearly provides for the allocation and trading of emission allowances and carbon credits. Decree No. 06/2022/NĐ-CP and Circular No. 01/2022/TT-BTNMT set out the technical basis for GHG inventory, measurement-reporting-verification (MRV), allowance allocation and market operation.

On 24 January 2025, the Government issued Decision No. 232/QĐ-TTg approving the project on the establishment and development of the carbon market in Viet Nam. The overarching objective of the Scheme is to develop a domestic carbon market that contributes to achieving the GHG mitigation targets set out in Viet Nam's Nationally Determined Contribution (NDC) at the lowest possible cost to enterprises and society, while generating new financial flows for emission-reduction activities, promoting the green transition and the diffusion of low-emission technologies, enhancing the competitiveness of Vietnamese enterprises in both domestic and international markets, supporting the development of a low-carbon economy and strengthening climate resilience in pursuit of net zero emissions by 2050.

The Scheme sets out three main phases.

(i) Phase of building the legal framework (until then end of 2025): By end of 2025, Viet Nam aims to progressively establishing the legal framework for trading GHG emission allowances and carbon credits, as well as for crediting and offsetting mechanisms, thereby ensuring the legal basis for piloting a carbon exchange. In parallel, infrastructure for the operation of the carbon market will be developed. During this phase, the management and operational capacity of state authorities, and the capacity and awareness of enterprises, organisations and individuals, are to be strengthened so that they are ready to participate in the market.

(ii) ***Pilot implementation phase (2026-2028):*** From end of 2026 to the end of 2028, a pilot carbon market will be implemented nationwide. The transfer of carbon credits and results of GHG mitigation to foreign or international partners will be studied and regulated in specific legal instruments and will be subject to approval by the competent authorities. During the pilot, all emission allowances will be considered for free allocation to GHG-emitting facilities in selected high-emission sectors. Carbon credits eligible for trading on the carbon exchange will include those generated from: Domestic programmes and projects under national crediting and offsetting mechanisms; Clean Development Mechanism (CDM) projects; Joint Crediting Mechanism (JCM) projects; Mechanisms established under Article 6 of the Paris Agreement. The Government will stipulate the proportion of carbon credits that may be used to offset emissions relative to the total allowances allocated to a given facility. Participants on the carbon exchange will comprise: Large GHG-emitting facilities listed in the sectors and entities subject to mandatory GHG inventory under the Prime

Minister's Decision and allocated emission allowances; organisations and individuals that meet prescribed conditions to buy and sell carbon credits on the exchange.

(iii) ***Full operational phase (from 2029 onwards):*** From 2029, the carbon market is expected to move into full operation nationwide. The sectors and facilities subject to allowance allocation may be progressively expanded according to a defined roadmap. Emission allowances will be allocated through a combination of free allocation and auctioning. The detailed proportions between free allocation and auctioning will be proposed during the pilot phase once sufficient information and data on allowance allocation and trading volumes are available. Additional categories of carbon credits may be recognised as eligible for trading on the exchange. The Government will continue to regulate the proportion of carbon credits that can be used to offset emissions relative to the total allowances allocated to each facility. Consideration will also be given to expanding the range of entities allowed to participate in carbon-credit trading on the exchange, including possible adjustments to the conditions for organisations and individuals wishing to trade.).

According to the national roadmap, Viet Nam plans to operate a pilot carbon-credit exchange in 2025 and to move towards full operation from 2029. The pilot phase has now been shifted to end of 2026. The Ministry of Finance is currently leading the design of the exchange's organisational model, management mechanisms and modalities for linking with international markets such as CORSIA, JETP-related mechanisms and Article 6 arrangements under the Paris Agreement. Initial proposals envisage a model combining the Stock Exchange and a Carbon Exchange, with payment, custody and supervisory infrastructure aligned with international practice.

Several provinces and enterprises have begun piloting voluntary carbon-credit transactions, particularly in REDD+ projects, afforestation and reforestation, renewable energy and solid-waste management. Viet Nam has successfully sold millions of REDD+ credits internationally, for example through the Emission Reductions Payment Agreement with the World Bank's Forest Carbon Partnership Facility (FCPF). These experiences provide valuable lessons for scaling up and integrating voluntary activities into the emerging compliance market.

Concerning the MRV systems and GHG inventories, there has been progresses. At present, six sectors are required to conduct GHG inventories: energy, transport, construction, industry, agriculture and waste. However, the degree of readiness varies considerably between sectors. Many large enterprises falling within the inventory obligations still lack the technical capacity to perform MRV in line with international standards. Data systems remain fragmented and not fully interoperable, which complicates the verification of emission reductions and the issuance and trading of carbon credits. The development of a robust, harmonised MRV system and an integrated emissions database is therefore a critical precondition for the credibility and environmental integrity of Viet Nam's carbon market, as well as for any future linkages with international markets.

Viet Nam has substantial potential to generate carbon credits, especially in forestry, renewable energy, energy efficiency and circular-economy activities. Forests, in particular,

offer large-scale opportunities for high-quality removals and nature-based solutions. Nevertheless, the domestic voluntary market remains underdeveloped and is still driven mainly by international demand.

Domestic enterprises currently have limited incentives to participate, as binding obligations and clear carbon-pricing signals have not yet been fully established. As a result, liquidity is low and transaction volumes are modest.

2.3 Determining Viet Nam's position in the international green value chain

Viet Nam possesses a combination of natural endowments, demographic advantages, and socio-economic characteristics that create a strong foundation for the country to become a regional hub, supplier, and key producer within the emerging green value chains of Southeast Asia, provided that the right strategies are applied. These advantages can be grouped as follows:

2.3.1 Geoeconomic and geopolitical advantages

As the global economy shifts decisively towards low-carbon development, Viet Nam's geopolitical position increasingly reflects its strategic importance in the regional green value chain. Located at the heart of Southeast Asia, Viet Nam holds a critical position as a maritime gateway to the East Sea, one of the world's most essential shipping routes that directly links trans-Asian and trans-Pacific transport flows. This strategic location positions Viet Nam as a natural trans-shipment node for green trade and green investment, while significantly reducing logistics costs for the export of environmentally friendly products and the import of clean technologies.

In parallel, Viet Nam's network of deep-sea ports and coastal industrial clusters, such as Cai Mep-Thi Vai, Sai Gon and Hai Phong, continues to receive substantial investment upgrades, providing a robust logistical foundation to develop "green export centres". These ports are not only gateways for trade but also form the nucleus for attracting investment into battery manufacturing, green electronics and organic agriculture, positioning Viet Nam to access higher-value segments of regional supply chains.

From a wider geoeconomic perspective, Viet Nam sits adjacent to major manufacturing zones in China and ASEAN. This proximity gives Viet Nam a distinct advantage in absorbing the ongoing shift of production into countries with lower carbon-cost footprints. The geographical closeness allows seamless participation in regional supply chains while harnessing domestic renewable energy to support industrial decarbonisation. Its vast reserves of solar and onshore/offshore wind energy further strengthen Viet Nam's prospects for forming low-carbon industrial clusters and eventually exporting clean energy.

Viet Nam also benefits from a strong institutional and trade advantage, stemming from its layered network of free trade agreements (ASEAN, CPTPP, EVFTA, RCEP and others). These agreements expand export markets for green goods while facilitating carbon-traceability requirements and preferential tariffs for sustainable products.

Further strengthening this position, Viet Nam's balanced diplomatic relationships with China, the United States, the European Union, Japan and the Republic of Korea provide access to a

diversified pool of green finance, technology partnerships and market opportunities. This reduces the risks associated with over-dependence on any single market and supports a resilient and self-reliant green supply chain.

2.3.2 Natural advantages

Viet Nam holds substantial natural carbon-stock resources, with forest cover exceeding 40% of total land area, encompassing natural forests, mangroves and restored plantations. These ecosystems serve not only as major carbon sinks but also as valuable economic assets through ecosystem services and tradable carbon credits in regional and global markets.

Viet Nam's location near the equator ensures a warm, humid climate that supports high biodiversity and strong carbon-absorption capacity. This ecological foundation underpins opportunities in bio-economy development, voluntary carbon markets and the monetisation of ecosystem services. With sustainable management, Viet Nam could generate tens of millions of carbon credits annually, reinforcing its contribution to achieving Net Zero by 2050.

Complementing its biological endowments, Viet Nam possesses exceptional natural conditions for renewable energy development. High solar radiation year-round and over 3,200 kilometres of coastline provide significant onshore and offshore wind potential. Technical estimates place total solar potential at around 840 GW and wind potential at 350 GW, far exceeding the country's existing installed capacity. This abundance of renewable energy facilitates energy-system diversification, enables the attraction of green investment, especially from Europe and Japan, and establishes a platform for new supply chains such as green hydrogen, sustainable materials and low-carbon industrial technologies. These foundations strengthen Viet Nam's long-term integration into global green value chains.

2.3.3 Social and human capital advantages

With a population approaching 100 million, Viet Nam is among the largest consumer markets in ASEAN. Crucially, sustainable consumption awareness is rising rapidly: domestic demand for green products increased by 15% annually from 2021 to 2023, with 72% of consumers willing to pay a premium for environmentally friendly goods. This forms a domestic green demand base, enabling local firms to test, refine and scale sustainable business models before expanding into international markets.

Viet Nam's rapidly evolving digital economy, valued at approximately USD 36 billion in 2024 and projected to reach USD 90-200 billion by 2030[8], provides another major advantage. Digital infrastructure supports smart logistics, transparent supply chains and robust product traceability—essential requirements for participating in green international trade. At the same time, digital platforms underpin carbon-credit exchanges, emissions-data systems and digital green finance solutions, improving transparency, reducing transaction costs and widening access to green capital.

[8] Song Linh (2024), "Năm 2024 quy mô nền kinh tế Internet Việt Nam ước tính đạt 36 tỷ USD"

Together, these trends are fostering an interconnected ecosystem of digital, financial and industrial capabilities, strengthening Viet Nam's competitive position within the regional green value chain.

2.4 Opportunities for Viet Nam

Given Viet Nam's Net Zero 2050 commitment and an estimated USD 368 billion requirement for green infrastructure by 2040, harnessing international finance initiatives is not merely advantageous but essential for ensuring sustainable growth and deeper integration into global value networks.

The major opportunities for Viet Nam can be grouped into five thematic areas:
(1) access to international finance,
(2) mobilisation of private investment,
(3) technology transfer and green-supply-chain development,
(4) capacity-building and governance improvements,
(5) market expansion and value-chain upgrading.

Table 6: Viet Nam's opportunities from selected international initiatives and financial mechanisms for the green transition

Initiative / Mechanism	Primary Objective	Scale of Committed Finance	Main Financial Instruments	Beneficiary Countries / Groups	Opportunities for Viet Nam
Seville Commitment - Financing for Development 4 (FfD4)	Reaffirms commitments made at COP29 under the Baku-Belem Roadmap to mobilise USD 1.3 trillion per year by 2035 for global financial restructuring to support the SDGs, climate action and sustainable infrastructure	Mobilisation of approx. USD 1.3 trillion annually to 2035	ODA, blended finance, private-sector mobilisation	Developing countries	Access to large multi-purpose global financial packages linked to SDGs, climate and infrastructure; support for green-finance policy reforms
Green Climate Fund (GCF)	Support developing countries in adaptation and greenhouse-gas mitigation	~USD 10 billion pledged in Phase I; Phase II mobilisation ongoing (~USD 40 billion)	Grants, concessional loans, guarantees, equity instruments to leverage blended finance and private investment	Developing countries under UNFCCC	Viet Nam is already a member; opportunity to expand proposals on coastal adaptation, renewable energy and climate-smart agriculture

Just Energy Transition Partnership (JETP)	Support a just energy transition, reduce coal dependence and expand renewable energy	Viet Nam: USD 15.5 billion committed (2022-2030)	Public-private finance; energy-infrastructure investment; carbon-credit mechanisms	Developing countries with net-zero commitments	Access to concessional and parallel investment for emission reduction, energy-system restructuring and private-sector participation
Global Environment Facility (GEF)	Address global environmental challenges: climate, biodiversity, land, water	Over USD 22 billion in grants + USD 120 billion in co-financing	Grants, technical assistance	183 member countries	Increased access to finance for ecosystem conservation, biodiversity protection and water-resource management
Adaptation Fund	Support adaptation to climate-change impacts	~USD 1.25 billion committed	Project grants, local capacity-building	Developing countries, climate-vulnerable communities	Potential to access projects that strengthen disaster resilience and climate-resilient agriculture
Loss and Damage Fund-L&D Fund	Provide financial support for climate-induced losses in vulnerable countries	Initial pledges of ~USD 768 million from 28 countries	Grants, emergency support, post-disaster recovery	Developing countries and climate-vulnerable nations	Access to emergency finance for sea-level rise, drought, floods and climate-related disasters

Global Shield/ V20	Strengthen climate-risk resilience through insurance and risk-sharing mechanisms	USD 210 million initial capital	Climate-risk insurance, loss-and-damage support funds	V20 group of 58 climate-vulnerable economies	Opportunity to develop climate-risk insurance models to protect agriculture and critical infrastructure
Climate Investment Funds	Support investments in emission reduction, clean energy and sustainable cities	~USD 11.4 billion mobilised, leveraging USD 61 billion in co-financing	Concessional loans, catalytic capital, risk-sharing instruments	Developing countries with clear climate strategies	Access to catalytic capital for solar energy, green transport and coal-transition projects
Global Green Growth Institute (GGGI)	Promote global green growth, policy advice, and green investment mobilisation	Technical support (not a financial fund); GGGI facilitated USD 4.1 billion in green investment in 2024 and over USD 14.5 billion since 2015	Technical assistance, policy analysis, training	40+ member countries	Vietnam is a member; opportunities for collaboration on green finance strategy, carbon market development and project preparation

Nguồn: Tổng hợp

2.4.1 Financial opportunities

Access to international financial resources

Recent landmark international initiatives have established ambitious policy frameworks and mobilised large-scale funding for the Sustainable Development Goals and climate-change adaptation, creating highly favourable conditions for countries such as Viet Nam to tap into multilateral finance and large-scale grant channels. Key mechanisms include the Sevilla Commitment (FfD4, adopted in March 2025), the Green Climate Fund (GCF), the Global Environment Facility (GEF), and the new Global Implementation Accelerator launched at COP30 in Belém (November 2025).

The Sevilla Commitment set a global target of mobilising USD 1.3 trillion per year by 2035 for green and resilient infrastructure, with a strong emphasis on low-carbon public transport, eco-cities, and large-scale renewable energy, all priority areas for Viet Nam. The GCF has already approved more than USD 30 million for a climate-resilient agriculture and water-security project in the Central Highlands and South-Central Coast regions, benefiting vulnerable smallholder farmers. Looking ahead, the GCF is prioritising concessional finance for agriculture, water, and green energy, perfectly aligned with Viet Nam's National Green Growth Strategy (2021-2030). The GEF continues to provide non-reimbursable grants for water-resource management and biodiversity conservation, strengthening disaster-response capacity in coastal and delta provinces.

Viet Nam has finalised its National Green Taxonomy (Decision 21/2025/QD-TTg) covering eight priority groups: energy, transport, construction, water resources, agriculture/forestry/fisheries, biodiversity, manufacturing & processing, and environmental services. Building on this taxonomy, the focus should be establishing a robust, bankable pipeline that can be presented immediately to the GCF, GEF, CIF, ADB, and World Bank, while also anchoring domestic green public investment and catalysing private co-financing.

Mechanisms such as the Just Energy Transition Partnership, GCF, Clean Technology Fund (CTF) under the Climate Investment Funds (CIF), and technical partnerships with GGGI, the World Bank, and ADB do not merely provide concessional capital; they also deliver technology transfer, institutional strengthening, and capacity-building, all essential for upgrading Vietnamese industry and services into green global value chains.

Mobilising private finance

The GCF, JETP, and GEF all explicitly promote blended finance — the strategic use of public and philanthropic capital to de-risk and crowd-in private investment for sustainable development. The JETP, with its USD 15.5 billion envelope (2022-2030), is the flagship example: it combines highly concessional public finance from G7 governments and multilateral banks with private-sector investment in renewable energy, grid modernisation, and just-transition programmes. The Climate Investment Funds operate catalytic first-loss capital and risk-sharing facilities that have already unlocked private green lending in transport and sustainable urban development.

To capitalise fully on these opportunities, Viet Nam must rapidly finalise an enabling policy package that includes tax incentives, green-credit directives, a fully operational domestic carbon market (pilot exchange targeted for late 2026), and clear revenue-recycling mechanisms from future allowance auctions. Only with a credible domestic carbon price and a pipeline of high-integrity certified carbon credits (especially from forestry and renewables) will Viet Nam become a genuinely attractive climate-investment destination in Southeast Asia.

2.4.2 Opportunities for technology transfer and capacity development

Technology transfer and clean-energy supply chain development

A green transition is not only about finance; it requires access to clean technologies and the creation of new energy supply chains. GCF-funded projects, JETP technical assistance packages, and GEF initiatives are already transferring climate-risk management technologies, state-of-the-art MRV systems, and international-standard project-preparation expertise. To date, the GCF has approved six projects in Viet Nam covering mitigation, adaptation, innovation, and energy-efficiency improvements for domestic enterprises.

As the third country (after South Africa and Indonesia) to join JETP in 2022, Viet Nam benefits from G7 commitments (particularly from Japan, Germany, and the EU) to transfer renewable-energy technologies, battery-energy storage systems (BESS), and smart-grid solutions. These transfers are explicitly designed to help Viet Nam build a domestic clean-energy manufacturing base.

The CIF's Clean Technology Fund has allocated USD 135 million to Viet Nam to demonstrate the commercial viability of energy-efficiency and renewable-energy investments, thereby crowding in private capital. This includes support for industrial energy-efficiency upgrades, seed funding for energy-service companies (ESCOs), private-sector renewable-energy risk-sharing facilities, and urban-transport improvements in Hà Nội and Hồ Chí Minh City.

By fully leveraging these initiatives, Viet Nam can accelerate the emergence of clean-energy industrial clusters and a domestic supply chain for renewable-energy equipment, reducing import dependence and enhancing international competitiveness.

Capacity building and skills enhancement

Programmes such as the GCF, Adaptation Fund, Global Shield, and GGGI provide not only finance but also extensive technical assistance, training, and institutional support for climate-risk governance. The GCF, for instance, finances domestic training in climate-finance management, international-standard project appraisal, and quantitative climate-risk modelling. The Adaptation Fund supports pilot community-based resilience models, particularly in agriculture and water management. The Global Shield initiative (led by the G7 and V20) opens the door for Viet Nam to develop a national climate-risk insurance mechanism combining public and private resources.

Between 2016 and 2020, GGGI assisted Viet Nam in drafting green-investment guidelines, mainstreaming green-growth indicators into socio-economic plans, and conducting a five-year review of the National Green Growth Strategy. In the 2024-2028 phase, GGGI is committed to

helping create an enabling environment for green investment and to preparing bankable projects in sustainable energy, energy efficiency, climate-smart agriculture, and waste management — with an indicative mobilisation target of several hundred million USD in additional green capital. GGGI has already facilitated approximately USD 410 million of green investment, including waste-to-energy plants and domestic green-bond issuances.

These programmes significantly strengthen policy formulation, financial management, and climate-risk oversight capacities, thereby lowering the cost of capital, improving sovereign credit ratings, and paving the way for long-term investment commitments.

2.4.3 Market and green value-chain opportunities

Upgrading position in global value chains

As an export-oriented economy deeply integrated into global value chains (GVCs), Viet Nam currently occupies primarily low-value-added assembly segments in automotive, electronics, and textiles. The global green transition is rapidly redefining competitiveness: major importers (EU, USA, Japan, Korea) are imposing low-carbon product standards, ESG requirements, and, from 2026, the full financial phase of the EU's Carbon Border Adjustment Mechanism (CBAM).

If seized effectively, this shift enables Viet Nam to move from a "low-cost assembly hub" to a green manufacturing base fully compliant with CBAM and other border measures, thereby preserving and expanding market share in the EU and attracting "China+1" investors seeking sustainable production locations.

Emerging green sectors and services

According to Bain & Company and Temasek, Southeast Asia's green economy could generate up to USD 150 billion of annual revenue by 2030 from sustainable agriculture and large-scale renewables. Viet Nam is well positioned to become a regional hub for renewable-energy equipment manufacturing, energy-efficient electronics, green construction materials, electric-vehicle components, and low-carbon agricultural exports. In parallel, a domestic green-services industry (carbon accounting, MRV, ESG verification, climate-finance advisory) is emerging that can first serve national demand and then expand regionally.

Synergies with "China+1" supply-chain relocation

Viet Nam's stable growth, deep integration, and strategic location already make it a leading beneficiary of global supply-chain diversification. By embedding rigorous green and ESG criteria into FDI promotion and industrial policy, Viet Nam can attract high-quality green FDI with low-carbon processes and strong local linkages, transforming itself from a low-cost satellite into a genuine green production node for multinational corporations.

2.5 Gaps and challenges

2.5.1 Challenges in green finance

Although Viet Nam has developed an increasingly comprehensive system of strategies, plans and action programmes for green growth and sustainable development, the current policy

framework still exhibits several notable limitations when compared with global frontrunners. For the Ministry of Finance, these gaps translate into specific constraints on how fiscal, financial and investment instruments can drive the green transition. Addressing these institutional gaps is essential to strengthening policy coherence, improving implementation effectiveness and creating sufficiently strong incentives for the green transition in the coming decade.

Dispersed strategic frameworks and limited climate-fiscal integration

A first challenge concerns the fragmentation of the strategic framework. While the Green Growth Strategy and the associated National Action Plan set out multiple objectives and priority actions, these have not been fully mainstreamed or operationalised across sectoral plans (such as the Power Development Plan, transport strategies or high-technology programmes), nor fully integrated at provincial and municipal levels. This lack of cross-sectoral coherence increases transaction cost, lowers accountability, and weakens the alignment between national goals and sub-national implementation[9].

From a fiscal perspective, climate and green-growth objectives are not yet systematically embedded in the State Budget Law, the Medium-Term Fiscal Plan and the Medium-Term Public Investment Plan. Existing pilots on green-budget tagging remain largely voluntary, use heterogeneous methodologies across ministries and provinces and are not linked to binding targets or to climate-risk assessments in the budget process. As a result, budget preparation, allocation and execution still treat climate spending as a series of isolated projects rather than as a cross-cutting investment priority with clear medium-term expenditure ceilings and performance indicators.

Incomplete legal foundation for green finance and green budgeting

The issuance of Decision No. 21/2025/QĐ-TTg, which establishes environmental criteria and provides a mechanism for certifying green investment projects, is an important step forward. It addresses past institutional limitations by introducing a national green taxonomy and establishing a legal basis for green project verification, green credit and green bond issuance. However, the taxonomy remains at an early stage, and further work is needed to align Viet Nam's system with international norms. This includes the development of detailed technical guidance, improved Measurement-Reporting-Verification frameworks and mutual recognition arrangements with regional and global taxonomies (such as the ASEAN Taxonomy, the EU Taxonomy and the ICMA Green Bond Standards). International experience demonstrates that countries that build taxonomies together with clear incentives, such as China's green credit guidelines or the EU's binding disclosure requirements, mobilise capital more effectively and reduce compliance costs for investors.

[9] Báo cáo triển khai Kết luận Phiên họp toàn thể lần thứ nhất Ban Chỉ đạo quốc gia về tăng trưởng xanh

At the same time, the legal framework for green budgeting is not yet complete. There is no explicit requirement in the State Budget Law or its guiding decrees to tag, report and evaluate climate-related expenditure and revenue, nor to conduct systematic climate-risk stress testing of fiscal aggregates. Large public-investment projects and National Target Programmes are not subject to mandatory climate-screening or "Do No Significant Harm" assessments. This limits MoF's ability to prioritise green projects in capital allocation, manage long-term climate-fiscal risks and demonstrate to development partners that climate is integrated into the budget cycle.

Underdeveloped capital markets for green and transition finance

Viet Nam's green finance market remains small and fragmented. While green credit and green bonds have begun to emerge, the market still lacks catalytic financial instruments that can mobilise capital at scale, such as transition funds, national guarantee schemes or sovereign green bonds. Japan, the EU and Korea have already deployed multi-billion-dollar transition and green investment funds to crowd in private finance. Viet Nam is still in a pilot phase and lacks a flagship instrument capable of shifting market expectations.

The domestic green bond market remains nascent. Despite the legal basis provided by Decree 08/2022/NĐ-CP, the market recorded only four issuances in 2024 with a total value of VND 6.87 trillion. This is far from the scale needed to support large green infrastructure projects. There is not yet a sovereign green or sustainability-linked bond to provide a benchmark yield curve for the market, nor a national transition-bond framework aligned with ICMA principles. Verification costs remain high for issuers, particularly SOEs and provincial authorities, and there are no fee subsidies or standardised templates to lower transaction costs. The lack of clear tax treatment or fee incentives for green instruments also reduces their attractiveness relative to conventional bonds.

Limited development of green credit and risk-sharing mechanisms

While the State Bank of Viet Nam has issued guidance encouraging green credit, Viet Nam does not yet have a fully fledged system of incentives and risk-sharing instruments to scale up sustainable lending.

There is no dedicated MoF-backed green credit-guarantee facility or refinancing window that offers lower-cost funding for taxonomy-aligned portfolios. Risk weights for green loans remain the same as for conventional loans, and there is no preferential tax treatment for interest income from green lending or for provisions linked to climate-aligned portfolios. Small and medium-sized enterprises and project developers in renewable energy, energy efficiency and circular-economy sectors continue to face high collateral requirements and short loan tenors, which do not match the long payback periods of green investments.

Coordination between MoF and SBV on climate-related financial stability risks is also at an early stage. Climate scenarios and transition risks are not yet fully integrated into macro-

prudential frameworks or into MoF's assessment of contingent liabilities arising from public guarantees and on-lending to SOEs.

FDI, industrial policy and green value-chain alignment

As the ministry now overseeing both finance and economic planning, MoF plays a pivotal role in shaping the quality and direction of FDI and domestic investment. However, investment incentives remain largely sector-based with limited performance conditionality and low environmental fees. Instruments such as corporate-income-tax exemptions, land-rent reductions and accelerated depreciation are still mainly tied to sector or regional priorities rather than to verifiable climate performance.

Viet Nam does not yet have a formally adopted "Green Investment Priority List" that concentrates the highest incentive tier on projects with low carbon intensity, strong technology-transfer commitments and deep local-supply-chain integration. Nor is there a clear negative list for high-emission or environmentally harmful projects. Taxonomy alignment and DNSH criteria have not been fully integrated into investment-approval procedures or into the evaluation of FDI projects. As a result, investment promotion risks locking in carbon-intensive assets at the same time that Viet Nam is committing to Net Zero.

SOEs, PPPs and fiscal-risk management

State-owned enterprises remain central to the energy, transport and industrial landscape. Yet SOE investment plans, borrowing strategies and corporate-governance frameworks are not systematically aligned with net-zero targets or the national taxonomy. Climate-related financial risks and stranded-asset exposure are not consistently integrated into MoF's oversight of SOE balance sheets and borrowing.

Similarly, while the PPP Law provides a general framework, green prioritisation and support mechanisms for green PPPs are still underdeveloped. There is no dedicated Green Viability Gap Funding mechanism, no national green guarantee facility and no clear framework for blending concessional climate finance with domestic budget resources to de-risk large-scale green PPP projects. This limits the pipeline of bankable projects in renewable energy, public transport and resilient infrastructure.

MRV, data infrastructure and market transparency

A further barrier is the immaturity of MRV systems for carbon and green finance. The absence of standard methodologies for green bonds and sustainability-linked financing limits market confidence. Although preliminary steps have been taken, including basic reporting templates and guidance for verification, Viet Nam still requires a full national MRV standard consistent with UNFCCC principles. Inadequate MRV capacity constrains both green finance mobilisation and the establishment of a robust domestic carbon market.

Relatedly, Viet Nam does not yet have a standardised methodology for generating carbon credits. International assessments suggest that Viet Nam's carbon market could reach USD 0.5-1.2 billion by 2030, with an annual emissions-reduction potential of 146-167 million tonnes of CO_2. The roadmap for a domestic carbon market, beginning in 2025 and moving to full operation by 2028-2029, focuses on high-emitting sectors such as electricity, steel and cement. To enable firms to participate effectively, the legal framework must be strengthened, particularly rules governing MRV, carbon-credit ownership, allocation and auctioning of allowances, and mechanisms for dispute resolution.

Enterprises also require clearer implementation guidance, capacity building and pilot projects, especially for unfamiliar financial instruments such as sustainability-linked loans, transition bonds and blended-finance structures. Awareness of green finance remains uneven among Vietnamese firms and financial institutions. Many companies do not fully understand the benefits of green financing or fear the perceived complexity of green-finance regulations. Beyond regulatory gaps, market infrastructure for green finance must be improved. Efficient markets for green financial products require transparent trading mechanisms, enhanced payment systems and credible data infrastructure. The absence of a centralised green-finance and ESG database managed by MoF limits transparency, increases information asymmetry and constrains investor due diligence. Building a centralised green-finance database, similar to the EU's Sustainable Finance Platform, would significantly improve transparency, reduce information asymmetry and support investor confidence.

Overall, compared with advanced economies and regional leaders, Viet Nam's policy architecture is broad but still lacks depth, integration and market-shaping instruments. Closing these gaps is essential if Viet Nam is to mobilise investment at scale, strengthen competitiveness and meet its Net Zero objectives.

The green transition demands sustained and substantial investment over decades. Public resources remain limited, while private capital mobilisation is constrained by market immaturity. The energy, transport and industrial sectors in particular require transformative investments: from large-scale wind and solar farms replacing coal; to smart transmission systems; to a rapid shift to electric transport. These require not only capital but also advanced technologies and durable financing mechanisms.

2.5.2 Challenges in transitioning to green value chains

Despite its potential, Viet Nam faces substantial challenges in transitioning to green and low-carbon value chains. The gap between investment needs and available capital remains significant. While overall investment requirements amount to hundreds of billions of US dollars, actual green investment, especially from the private sector, remains small and insufficiently aligned with long-term transition pathways.

A further challenge concerns the institutional environment, which must become more transparent, predictable and coherent. Some international investors continue to express

concerns about regulatory uncertainty, particularly in renewable energy and green industry. Policy delays can raise capital costs, undermine investor confidence and reduce Viet Nam's competitiveness relative to regional peers.

In terms of value-chain readiness, most Vietnamese firms remain positioned in low value-added stages such as assembly and basic processing. As global supply chains adopt higher standards for clean technology, emissions reporting, traceability and ESG compliance, firms must upgrade technological and managerial capabilities. Those unable to meet emerging requirements risk exclusion from new, greener supply chains.

Trade risks are rising from climate-related regulatory instruments such as the EU's Carbon Border Adjustment Mechanism. Export-intensive and carbon-intensive sectors such as steel, cement and fertilisers now face stringent requirements for emissions calculation and verification. Insufficient domestic data, digital infrastructure and standards impede compliance and heighten transition risks for Vietnamese exporters.

2.5.3 Challenges in technology, data, and human capital

Viet Nam's current technological capacity remains limited. As noted by Nguyễn Thị Hồng Tâm (2025), Viet Nam occupies a low position in global technology capability rankings, which creates substantial obstacles for adopting advanced and green technologies. Industrial energy efficiency remains well below regional averages: energy consumption per unit of GDP is roughly 1.5 times higher than the global average, underscoring the slow pace of clean-technology adoption.

The deployment of emissions-reduction technologies, such as energy-efficient equipment and low-carbon production processes, remains slow. Renewable-energy technology supply chains are underdeveloped, with most solar and wind components imported, increasing costs and exposing Viet Nam to external supply risks. Strengthening domestic manufacturing capacity in renewable-energy technologies would not only reduce dependence on imports but also enhance technological spillovers and job creation.

Infrastructure constraints further hamper the green transition. Legacy power grids, transport systems and urban infrastructure were built to older standards and are ill-equipped for green mobility, electrification and decentralised renewable energy. Public transport networks remain limited, and electric-vehicle charging infrastructure is insufficient. Upgrading this infrastructure is capital-intensive and will require coordinated public-private investment over many years.

Data systems also present a major bottleneck. Viet Nam lacks integrated, sector-wide databases on emissions and energy consumption. Information is maintained separately by ministries and provincial authorities, often using inconsistent methodologies. This fragmentation hampers national emissions accounting and limits the accuracy of national targets. Viet Nam's 2022 NDC specifically highlighted the absence of a national water-resource

database and the lack of cross-sectoral data integration, especially for climate-related information.

Human-capital constraints further challenge the transition. According to the World Bank (2023), skills shortages in renewable energy, circular economy sectors and environmental technology remain significant. Training systems lag behind the needs of the emerging green economy. Most workers in industry and agriculture rely on practical experience rather than knowledge of clean production or emissions management. Expertise in environmental engineering, green finance and greenhouse-gas measurement remains limited and concentrated in major cities and foreign-funded projects. Expanding national training programmes in climate science, green finance, energy engineering and digital technologies is therefore essential to build a workforce capable of supporting a green, knowledge-based economy.

3. Policy Orientation and Recommendations for Economic and Financial Measures

3.1 Strategic orientation for green transition in Viet Nam

Position the green transition a core pillar of the national development strategy

The green transition must be enshrined as one of the foundational pillars of Vietnam's overarching national development framework, transcending its status as a mere sectoral priority. This imperative demands the seamless, mandatory integration of climate objectives, sustainable development imperatives, and green-growth targets into the full spectrum of national strategies, planning documents, and regulatory instruments. These include the Socio-Economic Development Strategy 2021-2030 (with a vision to 2045), sectoral master plans, regional development plans, and provincial socio-economic plans. Furthermore, green-transition provisions must be embedded as non-negotiable elements within the Medium-Term Public Investment Plan, the State Budget Law, and all National Target Programmes, as reinforced by the mid-term review of the National Action Plan for Sustainable Development and Green Transformation (2021-2030) conducted in 2025.

This embedding must permeate every stage of the planning process, from initial formulation and project appraisal to capital allocation, to guarantee that all major decisions pertaining to infrastructure, industry, urbanisation, or transport are rigorously aligned with the net-zero emissions goal, green-growth principles, and enhanced climate resilience. Such alignment is not only a safeguard against entrenching high-carbon assets but also a prerequisite for fostering long-term sustainable development.

Integrating green-growth objectives into national and provincial socio-economic development plans is pivotal for ensuring that climate and sustainability priorities are translated into concrete policy actions and investment decisions. Under the revised Planning Law and forthcoming guidance from the Government, all planning instruments—including national socio-economic development strategies, sectoral master plans, and provincial plans—are expected to incorporate climate-transition pathways, emissions-reduction targets and resource-efficiency objectives. This integration will help align public-investment programming, land-use allocation, and sector strategies with Viet Nam's commitments under the Green Growth Strategy, NDC, and net-zero objectives. Hence, clear guidelines should be issued and applied to ensure that green-growth objectives are embedded in all stages of the planning cycle—from strategic formulation to budgeting, appraisal and implementation. This may include: (i) introducing mandatory climate-impact assessments for major public-investment projects; (ii) aligning provincial socio-economic plans with national green-growth targets; and (iii) integrating green-budget tagging into annual and medium-term budget frameworks to reinforce policy coherence.

Green the economic structure and value chains in line with global trade trends

The green transition must transcend the energy domain and infuse the entirety of Vietnam's economic architecture. In the industrial sphere, the shift from low-value-added assembly to a

high-technology, low-emission manufacturing ecosystem is essential, emphasising sectors with substantial value creation and minimal emissions, such as green steel (via electric arc furnaces), low-carbon cement (using clinker substitutes), sustainable building materials, clean-energy equipment fabrication, and energy-efficient electronics and appliances. In agriculture, transformation must centre on ecological, circular, organic, and climate-resilient models. In services and urban domains, emphasis must be placed on green and compact urbanism, clean public transport (e.g., electrified buses and rail), low-emission logistics (via multimodal hubs), eco-tourism, and carbon-neutral city management, interwoven with digitalisation and circular-economy tenets. The evolving international trade landscape, with the EU's CBAM entering full financial phase in 2026, the EUDR mandating plot-level traceability from 31 December 2024, and emerging ASEAN carbon-pricing harmonization, renders proactive greening of value chains an existential economic priority. Vietnam must therefore proactively craft a strategy for embedding into green value chains, pinpointing priority export sectors, and equipping enterprises with capabilities for emissions tracking, origin verification, and carbon-footprint disclosure. To integrate trade into Nationally Determined Contributions (NDCs), Vietnam should adopt a structured approach:

- **Identify climate-relevant strategic trade sectors** using four criteria: (i) Environmentally beneficial goods/services (e.g., energy-efficient equipment, low-carbon alternatives); (ii) High-emission products (e.g., cement, steel exports/imports); (iii) Climate-vulnerable sectors (e.g., agriculture, requiring adaptation measures); (iv) Exposure to partner-country climate policies (e.g., CBAM-impacted goods).
- **Compile a prioritised list**: Map key imports/exports by trade data, revealed comparative advantage (RCA), and economic complexity; assess NDC alignment; evaluate low-carbon growth potential and resilience; rank by climate contribution, job creation, and inclusivity.

In response to escalating global environmental standards (CBAM, ESG, PCF), Vietnam must prioritise:

- Develop a National Green Value Chain Strategy identifying priority sectors with high value-added and emission-reduction potential (green hydrogen, renewable-energy components, electric-vehicle supply chains, green materials, circular agriculture, and bio-based products).

- Establish a unified National Green Product Standards Framework harmonised with EU, ASEAN, and international taxonomies, covering lifecycle emissions, CBAM compliance, and product carbon footprints.

- Shift FDI incentives towards high-quality green projects that mandate technology transfer, local supply-chain development, and low-carbon intensity.

- Expand green-service exports (carbon accounting, ESG verification, MRV services, environmental technology consulting).

- Align international climate finance (GCF, JETP, MDBs) with domestic industrial-green strategies to maximise leverage and additionality.

Strengthen institutions, data systems, and governance for the green transition

Effective coordination across ministries, provinces, and stakeholders is indispensable.

Vietnam must consolidate and harmonise its legal framework (public investment, finance, energy, land, environment, and planning laws) to remove bottlenecks and contradictions. A powerful central climate and green-growth coordination body, directly under the Prime Minister and modelled on the UK Climate Change Committee or France's High Council on Climate, should be established with clear authority over resource allocation and policy monitoring. A National Climate and Green Finance Data Platform must be created, fully interoperable with the national statistical system, incorporating real-time emissions inventories, MRV systems, and green-budget tagging. Annual public reporting by ministries and provinces on emission-reduction and green-growth plans must become mandatory.

Ensure a just and inclusive green transition Sustainability hinges on fairness.

Vietnam must design comprehensive just-transition programmes for workers in coal mining, coal-fired power, and high-emission industries, including reskilling, income support, and alternative livelihood creation. Policies must explicitly protect vulnerable groups — low-income households, women, youth, ethnic minorities, and remote communities — from bearing disproportionate costs. Active participation of cooperatives, SMEs, and local communities in circular-economy and green-business models will broaden benefits and strengthen social cohesion.

Integrate green transition with digital transformation and innovation

Digital technologies (AI, Big Data, IoT, blockchain) must be harnessed to optimise energy systems, smart cities, precision agriculture, and emissions monitoring. A national green-digital start-up ecosystem should be nurtured, alongside stronger university-industry-research linkages to develop indigenous green technologies and enhance technological sovereignty.

3.2 Improving the governance framework for Vietnam's green transition

Strengthening Viet Nam's governance framework for the green transition has become increasingly urgent as international climate commitments grow more ambitious and the demands of cross-sector policy coordination become more complex. According to OECD recommendations, countries wishing to achieve a successful green transition must establish a coherent institutional architecture with a long-term vision, clearly defined quantitative targets

and robust coordination mechanisms. On this basis, Viet Nam must review and ensure the consistency and alignment of current strategies such as the Green Growth Strategy, the Climate Change Strategy, the National Power Development Plan and the NDC Implementation Plan. This framework must set out the objective of carbon neutrality, establish intermediate milestones and define the responsibilities of each ministry and sector, while being linked to a transparent monitoring and evaluation indicator system.

It is essential to strengthen inter-ministerial coordination at the Government level. Viet Nam currently lacks a sufficiently empowered central coordinating body for the green transition; OECD experience suggests that a high-level, cross-sectoral institution should be established or upgraded to unify policy direction, resolve conflicts between development objectives and ensure consistency in Government messaging. Models such as the United Kingdom's independent Climate Change Committee or climate-energy coordination councils in Europe offer useful points of reference. Establishing such a mechanism would help enhance cooperation across ministries and provide the institutional foundation needed for coherent climate and environmental policymaking.

The integration of green-transition objectives into planning, development strategies and the budgeting process is a core international practice, yet it remains a major gap in Viet Nam. Regional, provincial and sectoral plans must incorporate specific indicators on emissions, renewable-energy use, circular-economy development and climate-risk assessment. In public finance, Viet Nam needs to develop a green-budgeting system in line with OECD practices, including the classification of expenditure by climate relevance, green labelling for public-investment projects and a review of tax and fee policies to strengthen carbon-pricing instruments while gradually phasing out fossil-fuel subsidies. This is a critical condition for mobilising and allocating resources for the green transition in an efficient and transparent manner.

Improving mechanisms for inter-sectoral and multi-level coordination and enhancing the participation of the private sector is also essential. Viet Nam should institutionalise coordination regulations between ministries in the implementation of green policies, with clear mandates, data-sharing arrangements and reporting responsibilities. At the same time, greater autonomy should be delegated to local authorities, particularly in the implementation of circular-economy models, renewable energy and emission-reduction programmes. Establishing regular dialogue forums between the State, enterprises and social organisations is also an OECD good practice that helps resolve policy bottlenecks and supports businesses in meeting CBAM, ESG and sustainability-disclosure requirements.

Viet Nam must also enhance the legal framework and strengthen transparency and accountability. The national green-taxonomy system extending beyond Decision 21/2025/QD-TTg should be completed as soon as possible and harmonised with ASEAN and international standards; a stronger legal framework should be developed for green bonds, green credit, green insurance and the domestic carbon market. Viet Nam should also adopt sustainability-

reporting standards aligned with the ISSB/TCFD framework. Importantly, a comprehensive monitoring and evaluation system for the green transition must be established, including indicators on emissions, renewable-energy share, green expenditure ratios and the share of green credit in the financial system. The General Statistics Office, the State Audit Office and financial-supervisory authorities must be assigned explicit responsibilities in tracking and verifying these outcomes.

The green transition can only be sustainable if it ensures fairness. Viet Nam must therefore integrate the principles of a just transition into policymaking, including support for worker retraining, employment restructuring in fossil-fuel-intensive sectors and livelihood assistance for vulnerable groups. Experience from JETP countries demonstrates that neglecting social dimensions can lead to strong resistance from communities and firms. At the same time, institutional capacity must be strengthened and digital-data infrastructure for the green transition expanded, including a national database on emissions, green finance and MRV, ensuring transparency and effective oversight.

Viet Nam should develop a National Standard on Sustainability Disclosure in line with IFRS S1/S2 of the International Sustainability Standards Board (ISSB) and ASEAN guidelines. This standard would create a unified framework for listed companies, state-owned enterprises and financial institutions to disclose climate-risk information, ESG governance practices and transition strategies.

The disclosure framework should rest on three fundamental pillars: (i) mandatory ESG-reporting obligations implemented in three stages: voluntary (2026-2027), partially mandatory (2028) and fully mandatory (after 2029); (ii) independent audit mechanisms with ESG-reporting data integrated into a national data platform managed by the Ministry of Finance and shared publicly via open APIs with stock exchanges and supervisory bodies; and (iii) an incentives-and-penalties system, including preferential access to finance and reduced listing fees for compliant firms, and administrative sanctions or credit-rating downgrades for non-compliant firms. This model draws on the experience of Singapore and Malaysia, where integrating ESG databases with supervisory systems (SupTech/RegTech) has reduced reporting costs by 40-50 per cent and significantly improved disclosure reliability. For Viet Nam, standardised ESG disclosure will also generate critical inputs for Green-IA tools and enable investors to quantify environmental and social risks in their portfolios. ESG must be elevated from a voluntary ethics-based framework to a legally enforceable obligation. Strengthening Viet Nam's ESG regulatory system will not only ensure greater transparency and operational efficiency for firms but also enhance competitiveness, attract investment and deepen integration into global markets.

Building capacity through green-transition training

Developing a skilled workforce with deep expertise in green finance and green economics is essential to the effective implementation of policies and solutions for the green transition. An

effective training programme must be “tiered”, reflecting training levels, learning objectives and competency requirements. Viet Nam could adopt the following tiered training structure:

- **Senior leaders and high-level managers** should focus on strategic thinking and decision-making that integrates ESG and climate-change considerations. These topics can be embedded in leadership-training programmes, mid- and high-level political-administrative courses, or delivered through short courses and international workshops with experts from major development-finance institutions (WB, ADB, IFC, etc.). The objective is to equip leaders and strategic-level officials with an understanding of global sustainable-finance trends, Viet Nam’s role in the green economy and the capacity to integrate environmental and ESG factors into socio-economic planning and financial strategy.

Technical officers and specialists require advanced training in green financial techniques such as the national Green Taxonomy for project qualification, green-finance instruments, climate-risk pricing and project appraisal. Training programmes should be developed with universities, research institutes and international partners (such as GIZ and SECO), drawing on modern curricula and practical certification schemes (e.g. Certified Green Finance Professional). Case studies from Viet Nam and abroad, covering both successful and unsuccessful green projects, should be incorporated to strengthen problem-solving skills. A national online learning platform should be developed to disseminate green-economy knowledge to local authorities.

Strengthening Institutional Capacity and Financial-Climate Data Systems

Viet Nam should establish a national database on climate-related expenditure, revenue and debt, integrating information from the Ministry of Finance and Ministry of Agriculture and Environment and financial institutions. The statistical and audit authorities must be assigned clear mandates for monitoring environmental and climate expenditure, while the Ministry of Finance should standardise green-fiscal reporting indicators. In parallel, capacity-building programmes should be developed for officials on green-fiscal analysis, carbon pricing, climate-expenditure evaluation and green-financial-instrument design, drawing on technical assistance from the OECD, WB, IMF and other development partners.

Developing a Unified MRV System

For green finance to operate effectively, transparency and the ability to measure impacts are paramount. Viet Nam must therefore establish a unified MRV (Monitoring, Reporting, Verification) system to ensure that green capital flows are properly tracked and generate real climate benefits. A mandatory Environmental and Climate Impact Reporting Guideline should be developed for all projects and entities issuing green financial instruments, aligned with international standards such as TCFD and GRI but tailored to Viet Nam’s context.

An independent verification mechanism should be established in which:

- **Verifier training** is promoted, enabling domestic consultancy and audit organisations to become qualified second-party opinion providers or internationally recognised verifiers.
- **A green-data platform**—potentially using digital or blockchain solutions—is created to collect, store and publicly disclose environmental-impact data, enabling investors and the public to easily monitor project outcomes.
- **Inspection and supervision** frameworks are formalised through a Government Decree assigning clear authority, responsibilities and sanctions to relevant bodies such as the Ministry of Agriculture and Environment, the Ministry of Finance (State Securities Commission) and the State Bank of Viet Nam for ensuring compliance with green-reporting standards for financial institutions, listed enterprises, green-bond issuers and participants in the national carbon-credit market.

Enhancing communication and transforming policy mindsets for the green transition

Effective communication plays a vital role in increasing awareness of green finance, shaping public perception, stimulating action and generating demand for sustainable-finance products. It also builds societal consensus, thus supporting the formulation and implementation of green-financial policies.

To reshape national thinking on green development, Viet Nam should implement a nationwide communication campaign with clear, persuasive messages highlighting the economic and environmental benefits of green growth, underscoring that the green economy is not a compliance cost but an investment opportunity and a source of competitive advantage for the country, businesses and future generations. Commercial banks should be encouraged to promote their green lending and investment products to enterprises, households and communities, making green finance more accessible and attractive to the public. In addition, annual national awards should be introduced to recognise outstanding achievements in green finance, such as Green Enterprise Rankings or Green Finance Project Awards, to showcase exemplary models and inspire broader participation. On international platforms, Viet Nam should actively communicate its Net Zero commitments and policy actions to attract FDI, green investment and technical support from global financial institutions.

In terms of policy-mindset transformation, Viet Nam should develop a National Policy Handbook on Green Economy and Green Finance providing clear guidance to ministries, sectors and localities on integrating green goals into socio-economic planning. Policy decisions, especially those related to finance, budgeting and public investment, must include explicit consideration and prioritisation of climate and sustainable-development objectives. Rather than relying on administrative environmental regulations or short-term incentives, the Government should shift towards strong, stable and long-term financial-incentive mechanisms that encourage sustained progress in the green transition.

3.3 Mobilising and allocating financial resources effectively for the green transition

3.3.1 Fiscal policy

Gradually increasing the scale and quality of climate-related public expenditure, aligned with the medium-term fiscal framework

Viet Nam should aim to maintain a minimum of 1.5 per cent of GDP for adaptation spending (as reaffirmed in the updated National Adaptation Plan 2021-2030) and raise total climate-related public expenditure to at least 2.5-3 % of GDP by 2030, with a steadily increasing share for mitigation (renewable-energy investment, public transport and green infrastructure). MOF should consider setting the definition of major public-investment projects that must undergo mandatory climate-environment screening using the DNSH criteria to be added to the Green Taxonomy. At the same time, priority should be given to "dual-benefit" expenditures that both strengthen adaptation (coastal dykes, flood prevention, climate-smart agriculture) and reduce emissions, consistent with the WB and IMF's recommendations for "greener growth" in Viet Nam. MOF will set binding annual targets: 35 % of new public investment capital to carry the green label by 2028 and 50 % by 2030.

Institutionalising the national green-budgeting framework

This framework should be aligned with OECD guidance while adapted to national circumstances. It should include:

- issuing unified regulations on green-tagging of climate-related expenditure in the annual budget proposal. This can be considered as a revision to the State Budget Law;
- integrating climate targets into the medium-term expenditure framework;
- piloting and later scaling up environmental-climate impact assessments of spending and tax policies, starting with provincial levels and expanding to nationwide;
- improving disclosure and transparency of annual green-budget reports through launching public Green Budget Dashboard.

Given Viet Nam's decentralised budgeting system, local governments, especially vulnerable regions such as the Mekong Delta and Central Coast, should be encouraged to pilot provincial-level green budgets under central guidelines, with MOF providing technical templates and capacity-building funding for Mekong Delta and Central Coast provinces. This institutionalisation advances the Vietnam Green Growth Strategy's voluntary tagging by mandating full integration into the 2026-2030 Medium-Term Expenditure Framework, with annual MOF-led audits ensuring tagged expenditures deliver verified co-benefits like job creation in green sectors.

Stimulus expenditure and mechanisms to mobilise private capital

Beyond taxation, public spending should be designed as a tool to stimulate green behaviour. **By 2028, the Government should allocate at least 30 per cent of new public-investment expenditure to projects carrying a green label**, prioritising high-spill-over sectors such as energy infrastructure, green urban development, low-emission logistics, waste treatment and ecological restoration.

To improve the efficiency of capital deployment, Viet Nam should adopt co-financing models (green PPPs or blended finance), with public funds acting as catalytic capital, providing first-loss guarantees, policy-risk coverage or early-stage support, to crowd in private investment. The mechanism should aim for a minimum mobilisation ratio of 1.5 times private capital for each unit of public capital. Risk-sharing arrangements must be based on clear quantitative criteria and subject to oversight by the State Audit and independent institutions to prevent the transfer of excessive financial risks public sector.

Innovating monitoring and evaluation of green expenditure

Green fiscal reform will only be effective if accompanied by transparent monitoring and measurable impacts. The public-accounting framework should incorporate green indicators into financial statements and integrate them with the national MRV system. The Ministry of Finance should establish a Green Budget Dashboard to publicly disclose the share of green expenditure, emissions avoided and sector-level investment efficiency. Meanwhile, the State Audit Office and independent evaluators should be empowered to verify data and issue regular reports, with mandatory annual independent audits of the largest green-tagged programmes, ensuring accuracy, transparency and accountability in the use of green resources.

Restructuring the tax and fee system to incentivise green behaviour

The tax system must evolve from a revenue-generating instrument into a mechanism that indirectly prices carbon and shapes consumption and production behaviour. Vietnam's tax incentives remain largely sector-based with limited performance conditionality and low environmental fees. Thus, tax incentives should shift from "sector-based" to "performance-based", meaning that they should only apply to enterprises that meet verifiable criteria on emission reduction, technological localisation or knowledge transfer. The Ministry of Finance can consider linking corporate-income-tax holidays and accelerated depreciation (200 % rate) exclusively to projects certified under the National Green Taxonomy (Decision 21/2025/QĐ-TTg) and MRV-verified emission reductions of at least 15 % versus baseline. This reform would

build on the Vietnam Green Growth Strategy's proposed strategies by introducing mandatory, outcome-linked conditions. Targeted accelerated depreciation schemes should be applied to energy-efficient equipment, clean technologies and investment in low-emission production lines, expanded to cover battery storage for existing industrial facilities, with a pilot programme for SMEs in high-emission clusters like Dung Quat and Nhon Hoi.

In parallel, **Viet Nam must establish a clear roadmap for adjusting excise taxes and environmental fees for high-carbon-intensity products such as fossil fuels, cement, steel and chemical fertilisers**. A tax-rebate mechanism for projects that meet MRV standards would encourage enterprises to invest in green technological innovation, with MOF piloting a 50-70 % rebate on increased environmental fees for firms achieving >20 % emission reduction certified by MAE's MRV system, starting with the steel and cement sectors. The development of a green-tax system may draw on the experience of Sweden (SEK 1,300/tCO_2, fully revenue-neutral), Japan (GX-linked levies funding USD 13 billion in transition bonds), and Singapore (SGD 80/tCO_2 by 2030 with offsets and rebates). These examples show that gradual, predictable increases (10-15 % per year) combined with transparent revenue recycling can restructure industry without macroeconomic shocks, as demonstrated by Sweden's model, which has avoided revenue neutrality pitfalls through automatic adjustment clauses tied to inflation and emissions data.

The OECD also recommends accelerating the rollout of mandatory emissions-trading systems and using revenues from carbon taxes or the auctioning of allowances to provide targeted support for vulnerable households and investment in clean-energy infrastructure. MOF should therefore commit from the first year of full ETS operations (2029) that at least 50 % of auction revenues will be recycled via direct cash transfers to the poorest 40 % of households and the remaining portion ring-fenced for grid reinforcement, battery storage, and just-transition programmes in coal-dependent provinces (Quang Ninh, Thai Nguyen, etc.). This commitment is aligned with COP30's Mutirão decision to triple adaptation finance by 2035.

To strengthen the social acceptability and durability of Viet Nam's emerging carbon-pricing system, the Government—through the annual state-budget process and in accordance with the Budget Law—could consider prioritising a defined share of carbon-market revenues for just-transition measures. International evidence shows that transparent and predictable use of carbon revenues is essential for maintaining public support for carbon pricing. The EU Social Climate Fund and Canada's household-rebate mechanism demonstrate that directing a portion of ETS or carbon-tax proceeds to vulnerable households, workers and affected regions helps mitigate distributional impacts and ensures political legitimacy.

For Viet Nam, such prioritisation could include: targeted income support for low-income households exposed to higher energy costs; reskilling and redeployment programmes for workers in coal and high-emission sectors; and regional economic-diversification initiatives for provinces dependent on fossil-fuel activities. These allocations would not require an

automatic earmarking mechanism but could be incorporated through MoF's budget-preparation cycle, medium-term financial planning and annual expenditure decisions. Embedding a transparent, rule-based approach to revenue use from the outset will be critical to ensuring that the ETS contributes not only to mitigation outcomes but also to social equity and a credible just transition.

3.3.2 Developing the green financial market

Developing the green financial market represents a shift from "policy encouragement" to "market-based regulation", creating the foundation for mobilising societal resources for the green transition and enhancing the resilience of the national financial system. The overarching objective is to build a deep green-capital market with diversified products, low capital-raising costs and transparent supervisory mechanisms, enabling Viet Nam to integrate more deeply into global sustainable-finance standards. This development is particularly timely following COP30's Mutirão decision, which launched a new climate-finance work programme to scale public and private flows to USD 1.3 trillion annually by 2035, providing Vietnam with leverage to attract concessional funding for market infrastructure.

Promoting green bonds, green credit and sustainable investment funds

The development of green financial instruments must be based on a unified framework aligned with the national taxonomy and international standards such as the ICMA Green Bond Principles and ASEAN Green Bond Standards. The Ministry of Finance should lead in issuing detailed guidelines on issuance, disclosure and post-issuance supervision of green bonds, sustainability bonds and green fund certificates. Use-of-proceeds and environmental-impact reports must undergo limited assurance and be integrated with the national MRV system to ensure transparency and verifiability. MOF should issue Viet Nam's first sovereign green bond to set the benchmark yield curve.

The State Bank of Viet Nam should integrate green criteria into capital-adequacy and risk-management regulations, allowing lower risk-weights for compliant green-credit portfolios. Credit institutions should be encouraged to disclose their green-credit portfolios and will undergo periodic audits of MRV quality. Banks that maintain high-quality green-credit ratios with no reporting discrepancies may be given preferential refinancing or technical support.

For sustainable investment funds, minimum ESG-based investment criteria should be established, alongside mechanisms to prevent greenwashing and requirements for disclosing portfolios, asset-allocation ratios and tracking-error levels relative to green benchmark indices. Viet Nam may learn from the United Kingdom's Sustainability Disclosure Requirements or the EU's Green Fund Label to design its national green-fund certification scheme, and SSC should consider piloting certification for selected funds.

Establishing a transition-bond framework

For emissions-intensive sectors that cannot transition immediately, Viet Nam needs to develop transition bonds as an intermediate financial instrument between green debt and

conventional debt. The Ministry of Finance, in coordination with the Ministry of Agriculture and Environment, should issue a national Credible Transition Framework (aligned with ICMA Transition Principles), specifying issuance criteria, certification mechanisms and periodic reporting requirements.

Issuers must disclose a clear emissions-reduction roadmap with interim milestones, planned technological investments and budget allocations, and register science-based targets (SBTi) or equivalent commitments. All large issuances (a benchmark of VND 1,000 billion can be considered) must obtained SBTi validation. Impact-evaluation reports must be independently verified before, during and after issuance, covering metrics such as emissions abated per unit of capital, energy-efficiency improvements and technological-innovation outcomes.

The State Bank should adjust investment limits for transition bonds held by credit institutions based on credit rating, transition risk and MRV compliance. Within the first three years of implementation, the goal should be for transition-labelled instruments to account for 20 per cent of total green-debt issuance, with at least 70 per cent of financed projects achieving independently verified interim emissions-reduction targets. This framework will support the decarbonization goals for hard-to-abate sectors like steel and cement.

Establishing a green-financial rating system, national ESG database and SupTech/RegTech infrastructure

A transparent and reliable information system is essential for directing green capital effectively. Currently, ESG disclosure remains voluntary. As the next step, Viet Nam should develop a Green Financial Rating System to assess the sustainability performance of credit institutions and issuers based on three categories: (i) physical and transition climate risks; (ii) governance capacity, ESG strategy and disclosure transparency; and (iii) efficiency of capital use and verifiable emissions-reduction impact.

Rating outcomes should be linked to market incentives, such as reduced listing or depository fees, adjusted refinancing limits or modified minimum-capital requirements. The national ESG database managed by the Ministry of Finance should integrate enterprise data, project information, MRV records and public stock-exchange disclosures, with open API access and auditable logs to ensure transparency.

SupTech/RegTech tools should be deployed for automated ESG-compliance monitoring, using machine learning to detect discrepancies, cross-check reported data with MRV records and issue early-warning alerts for potential breaches. By 2027, the targets should include 100 per cent of credit institutions reporting standardised green indicators, full ESG disclosure by VN30 companies and less than 5 per cent material discrepancies after independent verification.

Leveraging climate-finance initiatives and innovative instruments

Given Viet Nam’s vast green-investment needs and limited public budget, innovative financing mechanisms must be expanded to attract private and international capital.

- **Debt-for-Nature Swaps:** The Ministry of Finance should negotiate with bilateral creditors and international financial institutions to convert portions of public debt into measurable ecological-conservation commitments. Such transactions should focus on critical ecosystems such as coastal mangroves, the Mekong Delta and northern mountainous forests. A dedicated domestic Green Trust Fund should be established to manage these resources with full transparency.
- **Blended Finance:** Viet Nam should create public-private co-investment funds for energy infrastructure, battery storage and wastewater treatment. Public capital should take the first-loss tranche to build investor confidence. The State Bank should collaborate with development-finance institutions (WB, ADB, GCF, AFD) to provide long-term VND credit lines, reducing exchange-rate risks and capital costs.
- **ESG-linked Reward Mechanisms:** Institutions and enterprises with high or significantly improved ESG ratings should receive preferential listing fees, interest rates or access to green refinancing. A claw-back mechanism must be established to remove incentives if ESG performance deteriorates, maintaining market discipline. MOF should consider issuing ESG-linked pricing guidelines with claw-back provisions.

Developing the green financial market will not only diversify capital-raising tools and reduce financing costs for the private sector but also place Viet Nam on a trajectory of deeper integration into the global sustainable-finance system. Once green financial instruments, ESG databases and modern supervisory technologies are fully operational, Viet Nam's financial market will align more closely with international standards of transparency, efficiency and environmental-social accountability, supporting the country's broader goals of green, inclusive and competitive economic development.

3.3.3 Developing the market for carbon credit trading

Vietnam's domestic carbon market holds immense strategic potential as a cornerstone of the green transition. It will establish a clear carbon-price signal, redirecting capital away from high-emission projects toward clean technologies, while unlocking novel revenue streams through credit sales and allowance auctions. PwC's 2025 Net-Zero Roadmap estimates Vietnam requires USD 473 billion to reach net-zero by 2050, with a well-designed carbon market capable of generating USD 15-20 billion annually by 2035 through domestic trading and high-integrity international cooperation under Article 6 of the Paris Agreement, provided double-counting is rigorously avoided and transparency standards are world-class. This potential is amplified by the COP30 outcomes in Belém (November 2025), where the Mutirão decision launched a new Global Implementation Accelerator to support NDC implementation, including carbon markets, and committed to tripling adaptation finance by 2035, creating opportunities for Vietnam to leverage international resources for MRV capacity-building and credit certification. The side text on fossil fuel transition and deforestation roadmaps further underscores the need for Vietnam to prioritise high-integrity credits from forestry and renewables to align with these commitments, while the new Gender Action Plan (GAP)

emphasises gender-disaggregated data in carbon projects to ensure equitable benefits for women in rural and forest-dependent communities.

Decree 06/2022/ND-CP (as amended by Decree 119/2025) and the revised Law on Environmental Protection (2020, amended 2022) provide the overarching framework. Decision No. 232/QĐ-TTg (24 January 2025), approving the Project on Establishing and Developing the Carbon Market in Vietnam, marks a pivotal milestone by outlining a two-phase roadmap: pilot operations nationwide from 2025-2028 and full market operation from 2029. The pilot phase is scheduled to commence in late 2026 for the power, steel, and cement sectors, covering approximately 2,000 installations responsible for ~80 % of national emissions — as confirmed by the National Assembly's monitoring report on 28 October 2025, which set the target for initial market formation and pilot exchange operations by end-2026, delayed from the original June 2025 goal due to ongoing MRV infrastructure development and regulatory finalisation. However, detailed implementing regulations remain incomplete: no final decree on exchange operations, domestic credit standards, linkage with voluntary markets, or Article 6 cooperation protocols have been issued, despite the pilot's impending launch, with free allowance allocation for 2025-2026 set by MAE.

The Ministry of Finance, particularly entities such as the State Securities Commission (SSC), and Hanoi Stock Exchange (HNX), must issue a comprehensive Carbon Trade Exchange Decree. This decree should specify operational regulations for the HNX carbon exchange (registry, trading platform, settlement, market surveillance, and anti-manipulation rules). Investment must also be made in the national digital MRV and carbon-registry system, standardising emissions-inventory, verification and credit-issuance procedures, alongside capacity-building programmes for enterprises subject to mandatory inventory requirements to ensure data credibility, which is fundamental for market confidence.

At the same time, Viet Nam should adopt a strategy to develop domestic carbon-credit supply, prioritising sectors with both substantial mitigation potential and co-benefits for adaptation and livelihoods such as renewable energy, climate-smart agriculture, sustainable forest management and circular-economy solutions in industry. The Government may provide initial support through project-preparation facilities, blended-finance mechanisms and technical cooperation with organisations such as the WB, GIZ and OECD to reduce transaction costs for small and medium-sized project developers.

In the longer term, Viet Nam should design a roadmap to transition from free allowance allocation towards partial auctioning, while committing to using auction revenues for green-infrastructure investment and just-transition programmes, including worker retraining and support for coal-dependent regions.

3.4 Policies to attract investment into the green transition

Enhancing policy stability and predictability in energy and climate domains

Numerous studies on green FDI and climate finance point out that Viet Nam's investment promotion framework still leans heavily on tax and land incentives, while factors that green investors value most, such as policy stability, legal transparency, infrastructure quality, technology absorption capacity and high-skilled human resources, have not improved at the same pace.

OECD and the World Bank both emphasise that long-term investors need a clear signal on the trajectory of emissions reduction, the timetable for phasing down coal, and the support framework for renewable energy (competitive auctions, bankable PPAs, risk-sharing mechanisms on foreign exchange and curtailment). This requires a review and alignment between the power development plan, climate strategy and mechanisms such as JETP, while limiting abrupt changes in tariffs, FIT regimes or contractual terms for clean energy projects.

International experience suggests that investors place a premium on governments that commit to multi-decade policy trajectories backed by law. For instance, the United Kingdom's Climate Change Act 2008 set legally binding carbon budgets and was complemented by a stable Contracts for Difference (CfD) scheme for renewables, which helped cut offshore wind prices by more than 60% between 2015 and 2022. Similarly, Chile's long-term auction programme for renewable energy, based on clear tender rules and grid-integration planning, has attracted some of the lowest solar and wind prices in Latin America. These examples indicate that Viet Nam could consider embedding its coal phase-down and renewable targets in framework legislation and designing auction/PPA schemes that are explicitly insulated from short-term regulatory changes.

Developing a financial ecosystem that strongly supports green capital flows

Building and effectively implementing a national green taxonomy, aligned with international disclosure standards (IFRS, GRI, ISSB), will allow the market to identify genuinely green projects, reduce greenwashing risks and provide a basis for banks, investment funds and bond issuers to design green financial products. In parallel, there is a need to encourage the development of instruments such as green bonds, transition bonds, sustainability-linked loans, green infrastructure funds and preferential credit schemes, on the basis of blending domestic resources with those of multilateral institutions (World Bank, ADB, AIIB) and global climate funds.

The European Union's experience illustrates the benefits of such an integrated framework: the EU Taxonomy, the Sustainable Finance Disclosure Regulation (SFDR) and the forthcoming EU Green Bond Standard together create a coherent system that channels institutional capital towards green assets while tightening disclosure obligations on asset managers. In ASEAN, Singapore has introduced its Green Taxonomy (Phase II) alongside mandatory climate-related disclosures for listed issuers from 2025, and Malaysia has rolled out the Climate Change and Principle-based Taxonomy (CCPT) for banks. Drawing on these benchmarks, Viet Nam could sequence its reforms by: (i) finalising and legally adopting the national taxonomy; (ii) requiring

large listed companies and financial institutions to disclose climate-related information in line with ISSB/IFRS S1-S2; and (iii) issuing national guidelines for green and transition bonds compatible with ICMA and ASEAN standards. MOF should issue secondary legislation adding DNSH criteria and detailed technical screening criteria for all remaining sectors. MOF should consider adopting National ESG Disclosure Standard.

Green De-Risking Window for Energy and Grid Projects

To move beyond incremental improvements and address Viet Nam's substantial climate-finance needs—estimated at USD 8-10 billion annually for the energy sector alone and around USD 368 billion in total by 2040—the Ministry of Finance and the State Bank of Viet Nam should jointly establish a Green De-risking Window for Energy and Grid Transition within existing public financial institutions, rather than creating a new extra-budgetary fund. This programme would be structured as a dedicated "green window" inside institutions such as the Viet Nam Development Bank (VDB) and the Environment Protection Fund, using entrusted public and concessional capital to de-risk private investment in priority projects.

The Green Blended Finance Window would have a clear mandate to design and deploy first-loss and risk-sharing instruments, using public or concessional funds to crowd in private capital at a minimum leverage ratio of 5:1. In practice, this would involve subordinated tranches, partial credit guarantees, revenue-support mechanisms and concessional co-lending structures that improve the bankability of large-scale projects. Priority should be given to grid modernisation, 500 kV transmission upgrades and Battery Energy Storage Systems (BESS)—the critical bottlenecks for integrating Viet Nam's existing and planned solar and wind capacity—as well as strategically important offshore wind and solar-plus-storage projects aligned with the national Power Development Plan.

By operating through existing public financial institutions and the current legal framework for entrusted funds, the Green Blended Finance Window avoids the need to create a new extra-budgetary fund, which would run counter to the government's policy of streamlining public financial vehicles. At the same time, it allows Viet Nam to adopt **"breakthrough" de-risking instruments comparable to those used by the Climate Investment Funds and other international climate-finance platforms, while maintaining full compliance with domestic budget, public-debt and financial-regulation rules.

To ensure effectiveness and integrity, the programme should be accompanied by clear eligibility criteria and transparency standards. All supported projects should be aligned with Viet Nam's forthcoming green taxonomy and national climate targets, subject to robust due diligence and MRV requirements, and coordinated with green-budget tagging and public investment planning. A structured governance arrangement—bringing together the Ministry of Finance, the State Bank of Viet Nam, line ministries (notably the Ministry of Industry and Trade) and participating financial institutions—would help ensure that the Green Blended

Finance Window operates as a central de-risking platform for the energy transition, rather than a fragmented subsidy scheme.

Shifting the focus from "quantity" to "quality" FDI, with green FDI as a strategic priority

Research on green FDI in Viet Nam shows that projects in renewable energy, clean-equipment manufacturing, green transport, waste treatment and sustainable agriculture tend to generate dual benefits for the economy and the environment, while also creating scope for technology spillovers. Investment incentives therefore need to be explicitly linked to conditions on technology, carbon intensity, localisation of supply chains and environmental standards, rather than being distributed broadly. At the same time, it is important to improve the capacity of domestic firms to absorb green technologies through support programmes for innovation, skills upgrading and linkages between foreign investors and local suppliers.

Several countries have repositioned their FDI strategies around "quality over quantity" with explicit green criteria. Ireland, through IDA Ireland, targets high-value, low-carbon investment in sectors such as clean tech, advanced manufacturing and digital services, combined with strong supplier-development programmes to integrate local SMEs. In East Asia, Korea's Green New Deal and Japan's Green Growth Strategy both use targeted tax incentives and concessional finance tied to measurable decarbonisation outcomes and R&D commitments. These experiences suggest that Viet Nam could: (i) create a dedicated "Green Investment Priority List" for sectors and technologies that qualify for the highest incentive tier; (ii) require large FDI projects to submit decarbonisation roadmaps and local-supply-chain development plans as part of investment registration; and (iii) link investment certificates to periodic reviews of environmental performance instead of solely ex ante approvals.

As Viet Nam proceeds with the ongoing revision of the Investment Law and its guiding decrees, currently before the National Assembly for review, the forthcoming incentive framework is expected to reflect a more selective, quality-driven approach to foreign investment, in line with national climate commitments and fiscal-policy priorities. Under the revised legislation, the Ministry of Finance should consider all tax and land-related incentives granted to investment projects that demonstrably satisfy a strengthened set of green-transition criteria, including:

i) a verified carbon-intensity level not exceeding 50 per cent of the sectoral average, measured according to national MRV requirements;
ii) a minimum 40 per cent localisation ratio by the fifth year of operation, contributing to domestic value-chain development and fiscal resilience;

iii) the conclusion of legally binding technology-transfer, training, and joint-R&D agreements with recognised domestic research institutes and universities; and
iv) full compliance with Do No Significant Harm (DNSH) requirements and social-safeguard provisions under the Vietnam Green Taxonomy.

In line with international experience and emerging OECD practices, incentive eligibility shall prioritise sectors with the highest contribution to green industrial transformation, including renewable-energy equipment manufacturing, battery and EV supply chains, green steel and aluminium, and high-value circular-economy industries such as textile-to-textile recycling and e-waste processing.

MOF should consider setting annual mobilisation target in green FDI inflows, focusing on high-impact projects capable of accelerating structural transformation while ensuring fiscal prudence, environmental compliance, and sustainable long-term development.

Linking green-investment policy with just transition requirements and the carbon market

Investment policies for the green transition need to be closely aligned with the requirements of a just transition and the emerging domestic carbon market. Firms investing in low-emission technologies or emission-reduction projects could receive dual benefits from investment incentives and carbon-credit revenues; conversely, sectors still reliant on coal, cement and steel should receive support for transition via concessional finance packages, worker retraining and infrastructure upgrading. If designed in a coherent manner, the carbon market and green-investment policy will be mutually reinforcing: the carbon market sets a price signal and generates public revenue, while green-investment policy directs private capital towards activities that help Viet Nam meet its NDC and Net-Zero targets at the lowest possible cost, while maintaining growth and socio-economic stability.

International examples show that linking investment incentives with just-transition measures is critical for political and social acceptance. The European Union's Just Transition Mechanism, with a budget of around EUR 55 billion for 2021-2027, channels grants, loans and guarantees to coal-dependent regions on condition that they adopt territorial just-transition plans, including labour-market measures and economic diversification. Germany's coal phase-out package allocates up to EUR 40 billion for affected regions, combining infrastructure investment, innovation funding and income support for workers. South Africa's JETP similarly ties concessional finance for the power sector to commitments on social protection and skills development. Inspired by these approaches, Viet Nam could earmark a defined share of carbon-auction revenues and concessional climate finance for just-transition programmes in coal-dependent provinces, require large green-investment projects receiving preferential treatment to include components on local job creation and reskilling, and integrate just-transition criteria into the approval process for major energy and industrial investments.

Table 7: Comparative international experiences and suggestions for Ministry of Finance in developing green financial markets

#	Policy Area / Instrument	International Best-Practice Key Features	Vietnam Current Status (Nov 2025)	Recommended Next Steps for MOF
1	**Green Public Procurement (GPP)**	• EU mandatory GPP • Japan Green Purchasing Act • Korea Green Purchasing Law	Voluntary GPP; low uptake	• Mandatory GPP • Develop National Green Product List • Use lifecycle-carbon criteria for major procurement
2	**Green Tax Reform (Eco-Fiscal Measures)**	• EU: reduced VAT for repairs/heat pumps • Japan/Korea: accelerated depreciation • Sweden: pollution taxes	No green VAT schedule; limited green depreciation; EPT not aligned with Net Zero	• Introduce green VAT schedule • Expand accelerated depreciation for clean tech • Reform EPT to reflect carbon content
3	**Green FDI Screening & Incentives**	• Korea/Japan: performance-based incentives; • EU: carbon criteria; • China: negative list	Incentives sector-based; DNSH not in approval criteria	• Create Green FDI Priority List • Add carbon/DNSH thresholds to tax and land incentives • Introduce negative list for high-emission FDI
4	**Climate-Fiscal Risk Management**	• NZ Climate Fiscal-Risk Statement; EU sovereign climate stress tests; IMF climate-informed DSAs	No climate fiscal-risk reporting; not integrated in MTFF/DSA	• Publish Annual Climate Fiscal-Risk Statement • Integrate climate scenarios into MTFF/DSA • Require climate-screening for all public investments

5	**Green & Transition Taxonomy**	• EU Taxonomy (2020-2025): 6 environmental objectives, Do No Significant Harm (DNSH) + minimum social safeguards, technical screening criteria per activity, mandatory for all regulated financial products • ASEAN Taxonomy v2 (2023): tiered approach (green / amber / red) • China (2024 update): unified with EU-style DNSH + coal phase-out list	Decision 21/2025/QĐ-TTg (Aug 2025) launched first official taxonomy (6 sectors, 72 activities). Still lacks full DNSH, social safeguards, coal exclusion list, and full technical screening criteria for most activities	• MOF leads in issuing Decree/secondary legislation adding binding DNSH criteria & social safeguards • Publish detailed Technical Screening Criteria for remaining 100+ activities • First annual review & alignment report with EU/ASEAN
6	**Green Bond Framework**	ICMA GBP four pillars (2025 refresh): 1. Use of Proceeds - 100 % taxonomy-aligned + DNSH 2. Process for Project Evaluation & Selection - publicly disclosed, independent committee 3. Management of Proceeds - segregated escrow or blockchain ledger 4. Reporting - annual allocation + impact report with KPIs, external verification	Circular 08/2023/TT-BTC + Decision 21/2025 adopted the four pillars in principle, but issuers can still self-define “green” without DNSH proof and many use internal tracking only	• Mandate external limited assurance for issuances > VND 500 bn • Require segregated escrow account or blockchain tracking • First sovereign green bond USD 1-2 bn as national pilot
7	**Transition Bond / Sustainability-Linked Bond (SLB) Framework**	ICMA Climate Transition Finance Handbook (2023), Japan GX Transition Bonds, UK Transition Finance Guide - require: science-based decarbonisation	No dedicated transition bond guidelines; only a handful of SLBs (e.g., Vingroup 2024)	• Issue National Credible Transition Finance Guidelines (aligned with ICMA 2025 update)

		pathway (SBTi or 1.5 °C-aligned), credible KPIs/SPTs, third-party verification pre- and post-issuance		• First state-guaranteed transition bond for steel/cement
8	**Mandatory ESG / Climate-Related Disclosure**	EU CSRD (phased 2024-2028), ISSB IFRS S1/S2 (global baseline), Singapore & South Korea (mandatory 2025-2030) - double materiality, scenario analysis, Scope 1-2-3 emissions	Voluntary under Circular 96/2020; only ~30 % of HOSE listed companies report basic ESG	• MOF decree adopting National ESG Disclosure Standard based on ISSB: i) Phase 1 (VN30 + SOEs + large banks); 2) Phase 2 (all listed)
9	**Green Credit Incentives & Lower Risk Weights**	China PBC (21 % risk weight for green loans + USD 400 bn re-lending facility), EU (supporting factor under CRR review), Indonesia (50-75 % RWA for sustainable loans)	SBV Circular 17/2022 only encourages; no preferential risk weight	• Amend existing regulations to adopt 20-30 % lower risk weight for taxonomy-aligned loans • Launch VND 150 trillion green refinancing facility (1-2 % interest, 10-year tenor) • Create guidance for 2% interest rate support programme for green projects
10	**Green Budget Tagging & Public Reporting**	France (100 % of budget tagged since 2020), Sweden, Indonesia, OECD Green Budgeting Framework - ex-ante & ex-post impact assessment, public dashboard	Pilot tagging 2023-2025; no public dashboard	• Make tagging mandatory for all ministries in State Budget Law • Launch interactive Green Budget Dashboard (online, real-time)

11	**Explicit Carbon Pricing & Revenue Recycling**	Sweden (SEK 1,300/t ≈ USD 125/t, 100 % revenue-neutral), British Columbia (100 % recycled), Singapore (SGD 80/t by 2030 + offsets)	Environmental protection tax (VND 30,000-100,000/t coal) but no broad carbon tax	• Pilot explicit carbon price in power & industry sectors • Commit the majority % of revenue to household rebates & just-transition fund
12	**Blended Finance / Catalytic Capital Vehicles**	GCF, CIF Act, EU Just Transition Mechanism, Korea K-Green Bond Fund + Guarantee Fund	JETP Resource Mobilisation Plan- coordination exists but no dedicated national vehicle	• Establish Vietnam Green Investment Facility (public-private, first-loss tranche) • Target leverage ratio 1:5 private capital
13	**Debt-for-Nature / Debt-for-Climate Swaps**	Seychelles (2016), Belize (2021), Gabon (2022), Ecuador (2023) - 10-30 % debt reduction for conservation	Discussions ongoing with Germany & France, but no closed transaction	• Close first swap for mangrove & forest protection • Establish Green Trust Fund to manage proceeds
14	**SupTech / RegTech for Green Finance Supervision**	Singapore MAS (Project Greenprint), Hong Kong HKMA (green finance tech sandbox), EU ECB climate stress-testing platform	Basic digital reporting only	• Deploy AI-driven SupTech module for automated ESG & green-bond compliance monitoring
15	**Transition Finance Packages for Hard-to-Abate Sectors**	Japan GX Economy Transition Bonds (JPY 20 tr target 2022-2032), Australia Taxonomy for steel/chemicals	Almost none	• First state-backed transition package (steel, cement, chemicals)

16	**Green / Climate Sovereign Bonds**	Chile (2019), UK (2021), Thailand (2023), Indonesia (2024) - raised USD 2-15 bn each	None yet	• Issue inaugural sovereign green / sustainability bond (to set benchmark yield curve)
17	**National Database of Green Projects & Data Integration**	EU Taxonomy Navigator, Singapore Green Finance Platform, China Green Project Library - single, public, machine-readable database of taxonomy-aligned projects, linked to national investment database	None yet	• MOF (lead) in establishing National Green Project Database (machine-readable, open API) • Full linkage with National Public Investment Database and MRV system
18	**Green Central Banking (Green Re-financing, Prudential Tools)**	• China PBoC: USD 10.7 bn green re-lending (2020). • UK BoE: GBP 10 bn green corporate bond purchase scheme. • South Korea: Bank of Korea including climate risks in macroprudential supervision.	SBV issued Circular 17/2022 + risk-management manual (2025), but no large-scale refinancing or prudential incentives.	• Co-develop with SBV a Green Re-lending Facility (VND 200 trillion). • Introduce macroprudential climate stress-tests. • Integrate climate risks into capital adequacy, liquidity and collateral frameworks.
19	**Green PPP & Infrastructure Finance**	• Thailand PPP pipeline: 92 projects, USD 33.39 bn (2020-2027). • Germany COVID Green Stimulus: EUR 50 bn for green infrastructure. • US Clean Energy Infrastructure Plan: USD 2 tn.	Viet Nam PPP law exists but lacks green prioritisation; no green PPP credit support mechanism.	• Introduce Green PPP Criteria aligned with taxonomy. • Establish Green Viability Gap Funding (VGF) mechanism. • Allow green PPPs to access guarantees & long tenor concessional credit.

4. Conclusion

As the world enters a period of profound and systemic green transformation, countries are not only recalibrating their growth models but are also restructuring entire economic systems to meet rising demands for emissions reduction, clean technologies and sustainability standards. Global shifts. from emerging regulatory pressures such as CBAM and mandatory ESG disclosure, to the rapid redirection of investment towards renewable energy, low-carbon technologies and carbon markets, are reshaping economic competitiveness for the decade ahead. These developments present significant challenges but equally create new avenues for growth, particularly for emerging economies such as Viet Nam.

Comparative analysis shows that Viet Nam has made meaningful progress in charting its green-transition pathway. The national strategic framework has advanced in line with international practice, reflected in the Green Growth Strategy, the Climate Change Strategy, Power Development Plan VIII and the country's strong COP26 commitments to achieve net zero by 2050. Early mechanisms for a domestic carbon market, green finance, green bonds, green budgeting and green-oriented FDI are beginning to establish the foundations for a low-emission economic transition. Nevertheless, Viet Nam remains at an "emerging" stage on the global green-transition map, with continued constraints in institutional capacity, policy coherence, technological readiness, investment scale and integration into low-carbon value chains.

To strengthen its position and enhance national competitiveness in the green-economy era, Viet Nam will need to pursue reforms that are ambitious, systemic and sustained. Priorities include developing an integrated, evidence-based governance framework for the green transition; advancing carbon pricing and operationalising an effective carbon market; modernising fiscal and financial policies to direct capital towards green priorities; expanding strategic value chains such as renewable energy, green materials, circular-economy industries and environmental services; and supporting enterprises to meet rising international climate and sustainability standards. Above all, the green transition should be regarded as a new development strategy, an opportunity to restructure the economy towards a more modern, resilient and competitive trajectory.

The green transition is not solely a matter of meeting international commitments; it represents a new driver of Viet Nam's growth from 2025 to 2050. By seizing emerging opportunities, building a modern policy framework and attracting high-quality investment, Viet Nam will be better positioned to become a regional hub for green manufacturing, deepen its participation in global value chains and secure sustainable and inclusive development. It is hoped that the analysis and recommendations provided in this report will support policymakers, regulators and businesses in identifying priorities and solutions to achieve a cost-effective, well-sequenced and high-impact green transition for the country.

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Annex 1: Principles of Mission-Oriented Governance

Element	Core Principles
1. Structure - Establishing the Mission Formally	**Legal and institutional framework:** Establish a clear legal and institutional architecture for effective mission governance. **Institutional anchoring:** Place the mission within an authority with suitable mandate, influence and organisational capacity. **Mandates:** Clarify responsibilities, roles and powers of all bodies involved in mission delivery.
2. Direction - Setting the Mission Orientation	**Roadmaps:** Break the mission into specific components with milestones, targets and resource alignment. **Political support:** Ensure long-term political backing that survives electoral cycles. **Societal engagement:** Engage citizens, communities and social groups in shaping mission objectives.
3. Co-ordination - Mobilising Collective Action	**Horizontal co-ordination:** Strengthen collaboration across ministries and sectors for alignment of goals and resources. **Vertical co-ordination:** Integrate central, regional and local governments to maintain coherent implementation. **Societal mobilisation:** Involve the private sector, non-profit organisations and communities in achieving shared objectives.
4. Implementation - Iterative Deployment to Achieve Mission Outcomes	**Broad policy mix:** Apply diverse policy instruments (financial, legal, technological) beyond administrative silos. **Process integration:** Integrate budgeting, investment planning, public procurement and planning processes into mission delivery. **Innovation and experimentation:** Encourage testing, learning, risk-taking and adaptive management. **Capabilities:** Build the technical skills, managerial capacity and tools required for implementation.

	Reflexivity: Continuously review and adjust actions based on monitoring, evidence and real-world feedback.
5. Resources - Ensuring Investments for the Mission	**Funding:** Secure long-term, sustainable financing aligned with mission scale and ambition. **Resource mobilisation:** Leverage public-private finance, partnerships and climate funds. **Financial innovation:** Promote the use of new financial tools (e.g. green bonds, climate investment funds).
6. Governance - Oversight and Co-ordination	**Monitoring:** Establish monitoring and evaluation systems using clear quantitative indicators. **Transparency and accountability:** Ensure regular reporting, data disclosure and public accountability. **Adaptability:** Update strategies and governance arrangements based on emerging scientific, technological or societal developments.

Source: OECD (2025)