

FINANCIAL INSTRUMENTS FOR MOBILIZING PRIVATE CAPITAL FOR GREEN INVESTMENT: INTERNATIONAL EXPERIENCE AND POLICY IMPLICATIONS FOR VIETNAM

CÔNG CỤ TÀI CHÍNH THU HÚT VỐN TƯ NHÂN CHO ĐẦU TƯ XANH: KINH NGHIỆM QUỐC TẾ VÀ HÀM Ý CHO VIỆT NAM

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Abstract - Amidst global climate change, mobilizing private capital is decisive in addressing fiscal gaps for sustainable development goals. This paper employs qualitative research and comparative analysis to systematize green financial instruments while synthesizing practical experiences from the European Union, the United States, China, and selected Asian countries. The findings confirm that establishing transparent regulatory frameworks, developing diverse capital-channeling instruments (green bonds, green credit), and effectively operating risk-sharing mechanisms (blended finance, public-private partnerships) are prerequisites for activating private investment flows. Based on an assessment of Vietnam's current situation, the study proposes key policy implications to refine the green financial ecosystem and enhance investor participation in the transition toward a low-carbon economy.

Key words - Green finance; green investment; private capital; financial instruments; sustainable development.

1. Introduction

Climate change is becoming the greatest challenge to global economic development, with extreme weather events, sea level rise, and environmental degradation exerting severe impacts on economic growth and social stability [1]. According to the IEA, in order to maintain the goal of limiting global warming to 1.5°C under the Paris Agreement, total annual energy investment needs to reach approximately USD 4.5–5 trillion by 2030 [2]. As public financial resources can only meet a small portion of this demand, mobilizing capital from the private sector has become decisive in financing green projects and promoting the energy transition [3].

Many international studies have confirmed the role of the green financial system - including green bonds, sustainable investment funds, and risk-sharing mechanisms - in creating a leverage effect to attract private capital [4]–[7]. In Vietnam, following its commitment to achieving net-zero emissions by 2050 at COP26, the World Bank estimates that financing needs for the energy transition and green infrastructure may amount to hundreds of billions of U.S. dollars over the coming decades [8], while the scale of the green finance market and private sector participation remain limited [9].

Against this backdrop, the article analyzes the system of financial instruments for mobilizing private capital for

Tóm tắt - Trong bối cảnh biến đổi khí hậu, việc huy động vốn từ khu vực tư nhân đóng vai trò quyết định nhằm khóa lấp khoảng trống ngân sách cho các mục tiêu phát triển bền vững. Bài báo sử dụng phương pháp nghiên cứu định tính và phân tích so sánh để hệ thống hóa các công cụ tài chính xanh, đồng thời đúc kết kinh nghiệm thực tiễn từ Liên minh châu Âu, Hoa Kỳ, Trung Quốc và một số quốc gia châu Á. Kết quả nghiên cứu khẳng định việc thiết lập khung pháp lý minh bạch, phát triển các công cụ dẫn vốn đa dạng (trái phiếu xanh, tín dụng xanh) và vận hành hiệu quả các cơ chế chia sẻ rủi ro (tài chính hỗn hợp, đối tác công – tư) là điều kiện tiên quyết để kích hoạt dòng vốn tư nhân. Trên cơ sở đánh giá thực trạng tại Việt Nam, nghiên cứu đề xuất các hàm ý chính sách nhằm hoàn thiện hệ sinh thái tài chính xanh và thúc đẩy sự tham gia của nhà đầu tư vào lộ trình chuyển đổi sang nền kinh tế carbon thấp.

Từ khóa - Tài chính xanh; đầu tư xanh; vốn tư nhân; công cụ tài chính xanh; phát triển bền vững.

green investment, synthesizes international experience, and assesses the current state of implementation in Vietnam, thereby proposing policy implications to promote the development of green finance.

2. Research methodology

This study employs a qualitative approach combined with comparative analysis to evaluate the system of financial instruments for mobilizing private capital for green investment. The data are primarily collected from reports by the World Bank, the OECD, the International Monetary Fund, the Climate Bonds Initiative, and policy reports from the EU, the United States, and China.

The documents are selected based on the following criteria: (i) timeliness (the period 2015–2025), (ii) official authority (reports issued by international organizations and regulatory authorities), and (iii) direct relevance to green finance and private capital mobilization. The case studies (the EU, the United States, China, Japan, and South Korea) are selected to represent typical models of green finance development in terms of scale and the degree of policy maturity. This approach contributes to enhancing the representativeness and generalizability of the policy implications in an international comparative context.

Based on the collected data, the study uses content analysis to systematize groups of green financial

instruments; comparative analysis to draw lessons from representative countries; and descriptive analysis to assess the current situation in Vietnam, identify achievements and limitations, and propose appropriate policy implications.

3. Research results and discussion

3.1. The system of financial instruments for mobilizing private capital for green investment

Green investment projects often involve high upfront costs, long payback periods, and greater risks than conventional projects. Therefore, designing appropriate financial instruments to improve the risk-return structure is a key factor in attracting the private sector [10].

Green bonds are the most common instrument, mobilizing capital for environmentally friendly projects such as renewable energy, sustainable transport, and waste management. According to the Climate Bonds Initiative, cumulative issuance had exceeded USD 3.2 trillion by the end of 2024, with new issuance in 2024 reaching approximately USD 670 billion [11]. At the same time, green credit plays an important complementary role through the commercial banking system, directly encouraging the shift toward sustainable production models [12].

Many countries have adopted blended finance mechanisms - using development-oriented capital from governments or multilateral banks to mobilize commercial capital flows through guarantees or concessional loans - in order to reduce risks for investors [13]. Public-private partnership (PPP) models provide an additional mechanism by transferring early-stage risks to

development finance institutions, thereby ensuring the feasibility of large-scale green infrastructure projects.

3.2. International experience in mobilizing private capital for green investment

The European Union (EU) is a pioneering region in the development of green finance. With the goals of achieving carbon neutrality by 2050 and reducing emissions by at least 55% by 2030, the EU has issued the European Green Deal (EGD), implemented the REPowerEU Plan (EUR 210 billion), and allocated a substantial share of the NextGenerationEU recovery package together with the 2021–2027 long-term budget (EUR 1.8 trillion) to climate objectives [14], [15].

In terms of the legal framework and financial instruments, the EU has developed the EU Taxonomy - a green classification system providing clear technical criteria - and issued the Sustainable Finance Disclosure Regulation (SFDR) and the EU Green Bond Standard (EU GBS). According to the Climate Bonds Initiative, Europe accounts for approximately 40–45% of total global green bond issuance, affirming its leading role in the international green finance market [11].

China has set the “30/60” targets (peak emissions by 2030 and carbon neutrality by 2060), which require the mobilization of approximately CNY 3–4 trillion (USD 450–570 billion) per year, with the private sector playing the primary role [16]. The People’s Bank of China (PBoC) plays a central coordinating role in policy implementation, developing a consistent green taxonomy framework and pilot green finance programs in multiple localities.

Table 1. Policies and financial instruments for mobilizing private capital for green investment in selected countries/regions

Country/Region	Targets and Main Commitments	Core Legal Framework	Main Financial Instruments	Key Policy Lessons
European Union (EU)	Net Zero 2050, 55% emission reduction by 2030, renewable energy at 45% (REPowerEU)	European Green Deal (EGD); EU Taxonomy; Sustainable Finance Disclosure Regulation (SFDR)	NextGenerationEU Fund, REPowerEU (EUR 210 billion), green bonds	Standardizing taxonomy and ensuring information transparency help strengthen investor confidence
United States	40% emission reduction by 2030	Inflation Reduction Act (IRA)	Tax incentives and subsidies (USD 369 billion), loan guarantees	Strong financial policies help stimulate private investment
China	“30/60” targets - peak emissions by 2030 and carbon neutrality by 2060	PBoC green finance policies; Green Bond issuance guidelines	Green credit, green bonds, green investment funds, PPPs	Strong state coordination helps direct capital flows
Japan	Net Zero 2050, 46% emission reduction by 2030	Green Growth Strategy; Green Transformation Promotion Act	Green Innovation Fund (USD 18 billion), transition bonds	Supports the transition of traditional industries
South Korea	Net Zero 2050, increase renewable energy to 30–35% by 2030	Framework Act on Carbon Neutrality; green taxonomy system (K-Taxonomy)	Green New Deal (USD 56 billion), risk guarantees (KOTEC)	Combines industrial policy with green finance

Source: Compiled by the authors from [11], [14], [15], [16], [19], [20].

With regard to green credit - the most important instrument - since 2012, commercial banks have been required to integrate environmental criteria into their lending processes, bringing outstanding green credit to CNY 30.37 trillion (approximately USD 4.2 trillion) by the end of 2023 - the largest green credit market in the world [17]. As for green bonds, China was the largest market in 2023, with USD 131.3 billion (approximately 40% of the global total) [18]. In addition, green investment funds,

credit guarantees, PPPs, and pilot green finance zones since 2017 have created conditions for testing various models before scaling them up nationwide.

In the United States, the Inflation Reduction Act (IRA) of 2022, with USD 369 billion in support for clean energy, electric vehicles, and hydrogen technology - through tax incentives, investment subsidies, and tax credits - aims to reduce emissions by 40% by 2030 and creates strong momentum for the private sector [19]. In addition, the

TCFD guidance on climate risk disclosure, the SEC’s proposed regulations on greenhouse gas emissions, and concessional lending/guarantee mechanisms of the Department of Energy (DOE) contribute to reducing the cost of capital for renewable energy projects.

In Asia, Japan promotes the Green Growth Strategy and the Green Innovation Fund, while also issuing green transformation (GX) bonds. South Korea has implemented the Green New Deal, developed a green taxonomy system (K-Taxonomy), and established green credit guarantee mechanisms to encourage firms to participate in renewable energy projects and green infrastructure [20].

Overall, international experience shows that establishing a transparent legal framework and developing a diverse set of green financial instruments are important factors in mobilizing private capital for sustainable investment.

3.3. The current state of financial instruments for mobilizing private capital for green investment in Vietnam

Faced with the requirement to achieve the Net Zero 2050 target and implement the National Green Growth Strategy, the World Bank (2022) estimates that Vietnam needs to mobilize USD 184–351 billion from the private sector during the 2022–2040 period (approximately 3.4% of GDP per year) - the largest source of funding needed to meet total financing demand of USD 368–701 billion under different scenarios (Table 2). This creates the need to assess the current state of existing financial instruments and the associated gaps [21].

Table 2. Vietnam’s green financing needs by target and scenario, 2022–2040

Financing needs	% GDP	USD billion Scenario 1 (0%)	USD billion Scenario 2 (2%)	USD billion Scenario 3 (6%)	Notes
Under the net-zero pathway	6,8	701	562	368	
Under the sustainable development goals	4,2	431	346	227	
Under the decarbonization target	1,5	156	125	81	
Of which – Private sources	3,4	351	282	184	Largest in all scenarios
– Public sources	2,4	248	199	130	
– International sources	1,0	102	82	54	

Source: [21]. Scenario = financing scenario; social discount rates of 0%/2%/6% correspond to Scenario 1/2/3, respectively. Figures are in constant 2022 prices.

The three scenarios in Table 2 reflect three different social discount rates: Scenario 1 (0%), Scenario 2 (2%), and Scenario 3 (6%). The social discount rate is the rate reflecting society’s preference for present welfare over future welfare - the higher the discount rate, the lower the present value of costs and benefits arising in the future, resulting in a lower estimate of total financing needs at present value. Specifically, under the carbon neutrality

pathway, Scenario 1 (0% discount rate) shows total financing needs of up to USD 701 billion, while Scenario 3 (6% discount rate) shows only USD 368 billion - nearly a twofold difference. This large divergence stems from the long-term nature of green investment (extending to 2040 and beyond), which makes the social discount rate a key parameter in determining the scale of financing to be mobilized. To reduce uncertainty, Vietnam should apply a social discount rate in the range of 2–4% - consistent with OECD and World Bank recommendations for developing economies - while building a sufficiently flexible portfolio of financial instruments to mobilize capital effectively under all three demand scenarios.

3.3.1. Initial achievements

(1) Green credit

Green credit is the most steadily developing channel for mobilizing private capital in Vietnam, with outstanding balances rising continuously from VND 75 trillion (0.73% of total credit) in 2015 to approximately VND 850 trillion by the end of 2025 (Figure 1), representing an average growth rate of over 21% per year over ten years [22], [23]. Two periods of rapid growth corresponded to the renewable energy boom driven by the Feed-in Tariff (FiT) mechanism: 2018 (33.9%) and 2021 (33.0%); the growth rate declined to 12.9% in 2022 when FiT ended, before recovering to 24.2% in 2023 (Figure 2). In 2023, green credit was concentrated in renewable/clean energy (45%) and green agriculture (30%); the remaining 25% was allocated to water management, green transport, and green buildings (Figure 3) [24].

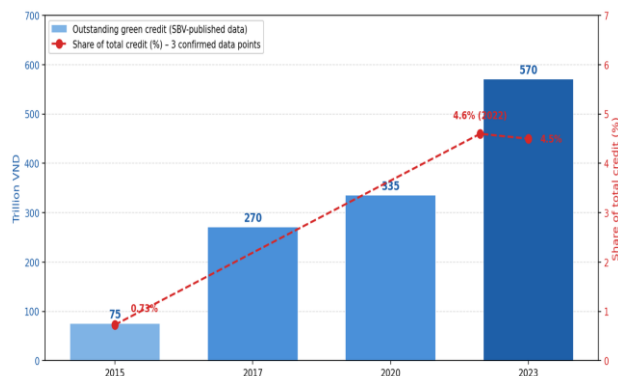


Figure 1. Outstanding green credit and its share in total credit in Vietnam

Source: [22]

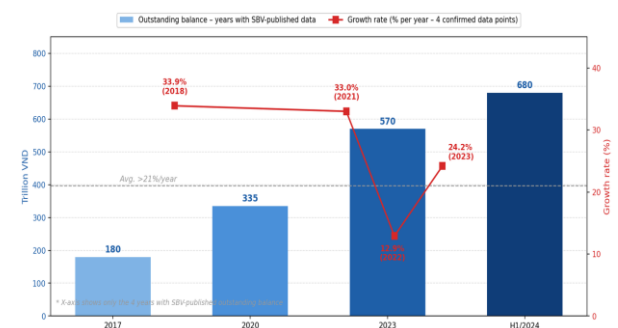


Figure 2. Outstanding green credit and growth rate in Vietnam, 2017–H1/2024

Source: [23]

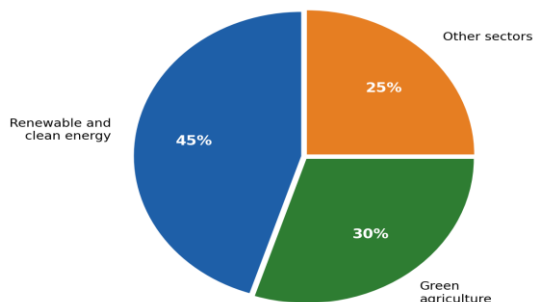


Figure 3. Structure of green credit by sector in Vietnam, 2023
Source: [24]

(2) Green bonds and green stocks

During the 2019–2023 period, Vietnam issued USD 1.157 billion in green bonds. By October 2025, the total outstanding value of Green-Social-Sustainability (GSS) bonds had reached nearly VND 25.4 trillion (approximately 1.8% of total outstanding corporate bonds), of which only 0.66% had independent verification; the remaining 1.14% had no third-party verification, posing a risk of greenwashing (Figure 4) [25], [26], [53]. Table 3 summarizes representative issuances. Regarding green stocks, the State Securities Commission operates the VNSI index, consisting of the 20 HOSE-listed firms with the highest ESG scores, and coordinates with IFC/GRI to provide ESG training for listed companies [52], [54].

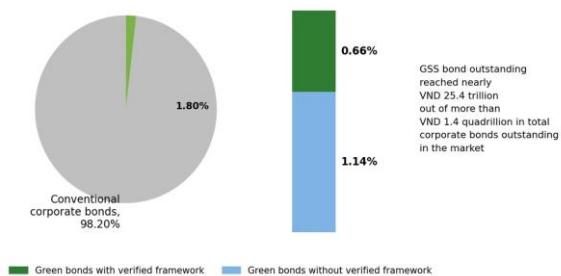


Figure 4. Structure of outstanding GSS bond value in Vietnam (as of November 19, 2024)

Source: [26]

Table 3. Green bond issuance value of selected credit institutions in Vietnam

Credit institution	Time	Bond type	Issuance value
EVNF	07/2020	Green bond	USD 75 million
BIDV	08/2024	Sustainability bond	VND 3 trillion (approximately USD 120 million)
BIDV	10/2025	Green bond	VND 4.3 trillion (approximately USD 104 million)
VCB	11/2024	Green bond	VND 2 trillion (approximately USD 80 million)
TCB	12/2024	Green bond	VND 450 billion (approximately USD 18 million)
HDB	01/2025	Green bond	VND 3 trillion (approximately USD 118 million)

Source: [27], [28]

(3) Green deposits

Since 2025, green deposits in Vietnam have been standardized according to four international pillars (LMA/ICMA Green Deposit Principles) [32]. BIDV was the first to issue a Sustainable Deposit Framework (April 2025) with a mobilization package of VND 5 trillion; VietinBank, Agribank, and Vietcombank have integrated green deposits into the national green banking strategy; interest rates are maintained at the same level as, or 0.1–0.2% higher than, those of conventional deposits.

(4) Green investment funds and the carbon credit market

The UVEEF Fund (established in November 2022) is the first ESG open-end fund in Vietnam. Regarding the carbon market, Vietnam ranks fourth globally in terms of the number of CDM projects, with 276 active projects and nearly 29.4 million carbon credits issued [29]. The roadmap for carbon market operation is implemented in three phases through 2029 (Table 4).

Table 4. Roadmap for carbon market development in Vietnam

Phase	Time	Key activities
1	Before June 2025	Development of the legal framework and technical infrastructure (national registry, MRV standards)
2	June 2025 – end of 2028	Pilot operation; gradual international integration
3	From 2029 onward	Nationwide market operation; international linkage

Source: [30]; compiled by the authors.

(5) ESG commitments and the green legal framework

According to PwC Vietnam (2025), 89% of enterprises have implemented or plan to implement ESG commitments within the next 2–4 years, with clear differentiation: FDI enterprises 71%, listed companies 57%, and domestic private enterprises only 27% (Figure 5) [31]. Decision No. 21/2025/QĐ-TTg on the national green classification provides a coherent legal foundation against greenwashing; the JETP commitment (USD 15.5 billion, COP27/2022) and the Net Zero 2050 commitment send positive signals for attracting international green investment [47].

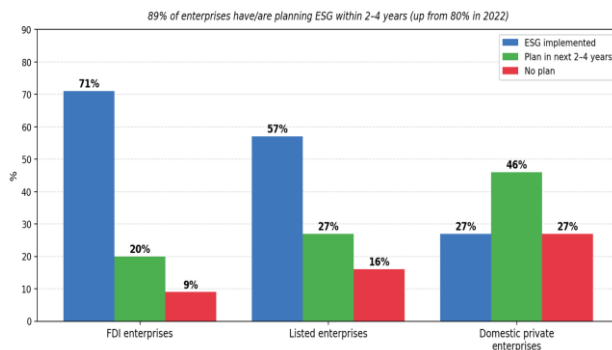


Figure 5. Status of ESG commitment implementation by type of enterprise in Vietnam, 2025 (%)

Source: [31]

3.3.2. Limitations and policy gaps

(1) Green credit: low share and structural imbalance

Green credit accounted for only 4.5% of total credit in 2023, significantly lower than in China (6.7%) or the European financial sector (31.3%). After the FiT mechanism ended, private green investment declined to USD 199 million in 2023 and USD 161 million in 2024 [35], [36], indicating dependence on price-based policy rather than market-based mechanisms. Approximately 95% of total private green investment is concentrated in the energy sector; green transport, the circular economy, and green buildings have had almost no access to market capital. The absence of a long-term green refinancing mechanism from the State Bank of Vietnam (SBV) is a direct technical barrier.

(2) Green bond market: small scale and lack of transparency

The GSS market accounts for only 1.8% of total corporate bonds, of which 63% have not been verified by third parties, creating a risk of greenwashing. International verification costs ranging from USD 30,000 to USD 80,000 per issuance are a major barrier for SMEs [37]. Vietnam does not yet have an independent domestic ESG rating organization and has not established a mandatory ESG reporting mechanism, while globally there are already more than 7,695 sustainable investment funds [38].

(3) Green guarantees and blended finance: the largest policy gap

Green guarantees have not been officially defined in the legal system; a national Green Credit Guarantee Fund has not been established; and the blended finance model has not been implemented systematically. As a result, high-risk green projects (sustainable agriculture, green public transport, circular economy) are unable to access commercial capital - this segment accounts for a large share of the USD 184–351 billion financing need. Meanwhile, Thailand has operated the Thai Credit Guarantee Corporation (TCG) since 1992 with cumulative guarantees exceeding USD 20 billion; Singapore has committed USD 5 billion to ASEAN through the IFC and MAS [39], [40].

(4) Low business awareness and legal gaps

According to VCCI (2023), only 31.8% of private enterprises clearly understand environmental regulations; 91% believe that environmental protection is the responsibility of local authorities [41]. The green classification document (Decision No. 21/2025/QĐ-TTg) lacks detailed technical guidance and is not yet compatible with ASEAN Taxonomy v2 [48]. The legal framework focuses mainly on the Environmental (E) factor, while the Social (S) and Governance (G) factors remain major gaps, limiting access to international financial alliances such as GFANZ. There is also a lack of sufficiently strong specific financial incentives (tax reductions, interest rate incentives, issuance fee support) to stimulate both the supply of and demand for green finance.

Table 5. Comparison of Vietnam and selected ASEAN countries in green capital market development

Criteria	Vietnam	ASEAN countries	Assessment and room for improvement
Green taxonomy	Decision No. 21/2025/QĐ-TTg – first formal system; lacks detailed technical guidance	ASEAN Taxonomy v2; many countries established detailed national taxonomies early	The gap is narrowing; ASEAN alignment is needed
Share of green credit	4.5% (2023); no refinancing mechanism; incentives remain recommendatory	Higher shares thanks to refinancing packages and formal interest rate incentives	Considerable room for improvement; a binding legal mechanism is needed
GSS market	1.8% of corporate bonds; 63% lack third-party verification; no domestic ESG rating	More developed market; many sovereign and corporate green bond issuances; domestic ESG ratings available	Significant potential after the 2025 Taxonomy removes definitional barriers
Financial incentive mechanisms	No specific tax or fee incentives for green debt issuance	Appraisal cost support; tax exemptions/reductions for green investors	The largest legal gap that needs to be filled to attract private capital
ESG risk governance	Focused on E; lacks S and G; ESG reporting not mandatory	ISSB, TCFD, and SFDR applied under mandatory roadmaps	S and G need to be integrated to access GFANZ and PRI

Source: Compiled by the research group from [52], [39], [40].

In sum, the gap between the need to mobilize private capital (USD 184–351 billion by 2040) and the current state of existing green financial instruments remains very large. Four priority legal gaps are: (i) a national green credit guarantee mechanism; (ii) an SBV green refinancing mechanism under a phased roadmap; (iii) a mandatory ESG reporting framework (including S and G); and (iv) timely operation of the carbon market.

4. Policy Implications

Based on the analysis of the current situation and a

comparison with international experience, the study proposes five priority groups of solutions, including:

(1) Improving the green taxonomy system as the legal foundation: Decision No. 21/2025/QĐ-TTg should be supplemented with detailed technical guidance for each sector (energy, transport, etc.) and a mechanism for periodic updates should be established. Priority should be given to alignment with ASEAN Taxonomy v2 [48] in order to enhance the ability to attract foreign capital and participate in alliances such as GFANZ [49] and PRI. A “one-stop” digital platform should be developed so that

enterprises can verify their green status and access appropriate financial products - a condition for the effective operation of all other instruments.

(2) Diversifying green financial products and developing a refinancing mechanism: The State Bank of Vietnam should issue a phased concessional green refinancing mechanism for commercial banks, directly addressing dependence on FiT, which caused private green capital to decline to USD 161 million in 2024 [36]. The Ministry of Finance should develop a green bond issuance framework with mandatory disclosure standards in accordance with TCFD/ISSB and provide support for independent verification costs for SMEs [26]. Additional products should also be developed, including green deposits in line with LMA/ICMA standards (replicating the BIDV model), green ETFs, and sustainability-linked credit tailored to each sector.

(3) Establishing a green credit guarantee mechanism and blended finance: A national Green Credit Guarantee Fund should be established (capitalized from the state budget and ODA) following the model of Thailand's TCG [39] in order to promote private capital flows into sustainable agriculture, green public transport, and the circular economy. Blended finance should be implemented systematically through the ADB, IFC, and the Green Climate Fund (GCF) following the Singapore model (USD 5 billion for ASEAN) [40] - this is the decisive group of solutions for meeting the financing need of USD 184–351 billion.

(4) Accelerating the operation of the carbon market in accordance with the established roadmap: With 276 CDM projects and 29.4 million carbon credits [29], Vietnam has a significant competitive advantage. It is necessary to ensure the completion of Phase 1 (legal framework, MRV infrastructure, registry platform) before June 2025 in accordance with Decree No. 06/2022 [30]; carbon pricing instruments should be developed and emissions data should be standardized in a manner compatible with the EU ETS and China's ETS [50]. An effectively functioning carbon market will reduce the cost of capital for long-term green projects.

(5) Mandating ESG reporting and enhancing market capacity: Mandatory ESG reporting should be implemented according to a roadmap for listed companies and expanded to cover the S and G dimensions in order to access GFANZ [49] and PRI - currently, only 27% of domestic private enterprises are doing so [31]. A domestic ESG rating system should be developed to reduce international verification costs (USD 30,000–80,000 per issuance [36]); large-scale training should be provided for banking staff on ESG risk analysis. Transparent emissions and ESG data are a prerequisite for attracting international institutional investors.

5. Conclusion

According to World Bank estimates [21], Vietnam needs to mobilize USD 368–701 billion during the 2022–2040 period to achieve the net-zero emissions target by 2050, of which the private sector must contribute USD

184–351 billion (approximately 3.4% of GDP per year). Experience from China and ASEAN countries confirms that only a comprehensive ecosystem of green financial instruments - including green credit, green bonds, green deposits, credit guarantees, blended finance, ESG funds, and the carbon market - linked to a national green taxonomy and a mandatory ESG disclosure mechanism can successfully mobilize private capital at the required scale.

In Vietnam, notable progress has been made: green credit is estimated to have reached approximately VND 850 trillion by the end of 2025 (an increase of more than elevenfold over ten years, averaging 21% per year) [22], [23]; USD 1.157 billion in green bonds was issued during 2019–2023 [25]; BIDV pioneered a VND 5 trillion green deposit framework [27]; Vietnam ranks fourth globally in CDM with 29.4 million carbon credits [29]; the first ESG fund (UVEEF) was launched in 2022; and 89% of enterprises have ESG plans [31]. However, the system remains insufficiently synchronized, overly concentrated in the energy sector (95% of private green capital), and dependent on policy rather than market mechanisms. The five proposed groups of solutions - improving the green taxonomy, diversifying products and refinancing, developing guarantees and blended finance, accelerating the carbon market, and enhancing ESG capacity - if implemented in a coordinated manner, will create a solid institutional foundation for Vietnam to unlock large-scale private capital flows and meet its green and sustainable development goals over the next two decades.

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