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An Evaluation of Vietnam's Construction Investment Regulatory System Concerning Net-Zero Transition

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Abstract

Vietnam has committed to achieving net-zero carbon emissions by 2050, a target that necessitates transformative changes across all economic sectors, with the construction industry playing a pivotal role due to its significant carbon footprint. This study systematically evaluates Vietnam's current construction investment regulatory system to assess its readiness and effectiveness in promoting the national net-zero transition. Utilizing desk research and content analysis of relevant laws, decrees, circulars, and technical standards, the research applies the CETEx and OECD frameworks to identify regulatory strengths, weaknesses, and gaps. Findings reveal that while Vietnam has established a foundational legal framework and strategic policies (e.g., Decree 06/2022/ND-CP, Lotus Green Building Certification) for climate action, explicit and binding regulations for net-zero considerations, such as mandatory embodied carbon limits or project-level carbon budgets, are largely absent in investment and permitting processes. Enforcement remains fragmented, particularly at the subnational level, due to capacity deficits. A critical disconnect exists between regulatory mandates and financial incentives, with a notable absence of dedicated green finance instruments (e.g., green bonds, targeted subsidies) and integrated project pipelines to de-risk and scale low-carbon construction. Furthermore, stakeholder engagement lacks formalized, cross-sectoral coordination, and regulatory impact assessments do not consistently integrate climate-focused metrics. The study concludes that despite strong strategic alignment with net-zero ambitions, Vietnam's construction investment regulatory system faces significant operational hurdles. Recommendations include institutionalizing low-carbon mandates in investment approvals, establishing incentive-based green finance mechanisms, building local implementation capacity, creating an integrated green construction project pipeline and data platform, and strengthening adaptive governance with climate-sensitive regulatory impact assessments. These insights offer a roadmap for policymakers to transform Vietnam's construction sector into a proactive driver of its net-zero future.

1. Introduction

The global imperative to address climate change has catalyzed an unprecedented transition towards net-zero emissions, positioning this goal as a cornerstone of sustainable development strategies worldwide [1]. Within this critical transformation, the construction industry holds a pivotal yet dual role. As a significant contributor to global greenhouse gas emissions – accounting for nearly 40% of energy and process-related emissions – it is a major source of environmental pressure [2]. Simultaneously, it possesses immense potential to be a driving force for decarbonization through sustainable design, energy-efficient materials, renewable energy integration, and resilient infrastructure development. The sector's ability to innovate and adopt low-carbon practices is therefore fundamental to achieving global climate targets [3, 4].

Recognizing the urgency of the climate crisis, Vietnam has made a resolute commitment to this global effort. At the 26th Conference of the Parties (COP26), the nation pledged to achieve net-zero greenhouse gas emissions by 2050, signaling a profound shift in its national development trajectory [5]. This ambitious target necessitates transformative changes across all sectors of the economy, demanding a fundamental re-evaluation of traditional practices and the implementation of robust decarbonization strategies. Given its pivotal role in economic growth and urbanization [6], Vietnam's construction sector is both scrutinized and positioned for leadership in the net-zero transition.

Current practices within Vietnam's construction industry, however, reveal significant challenges in aligning with the net-zero ambition. While nascent efforts towards green building certifications (e.g., LOTUS, LEED) and energy efficiency standards exist, widespread adoption remains limited. Only 599 green buildings, including both industrial and offices, residential buildings have been certified so far [7]. The sector continues to grapple with reliance on carbon-intensive materials, energy-inefficient building envelopes, conventional construction methods with high waste generation, and insufficient integration of renewable energy solutions at scale [8]. Bridging the gap between the national net-zero commitment and on-the-ground industry practices is therefore an urgent priority.

Despite some efforts such as fostering green building certifications (e.g., LOTUS, LEED) with 599 certified buildings [7], Vietnam's construction sector faces substantial challenges. The industry relies heavily on carbon-intensive materials, energy-inefficient designs, and coal-powered energy, compounded by high costs of sustainable technologies [8]. These barriers hinder alignment with national net-zero goals.

The regulatory system governing investment and construction activities plays a decisive role in either accelerating or hindering this transition. Effective regulations can establish clear standards, incentivize green investments, mandate sustainable practices, facilitate access to green finance, and create a level playing field that rewards low-carbon innovation. Conversely, outdated, fragmented, or weakly enforced regulations can perpetuate unsustainable practices and stifle the necessary transformation [9]. Evaluating the capacity of Vietnam's existing construction investment regulatory framework to actively promote and support the sector's net-zero transition is thus crucial.

Despite the critical importance of this regulatory landscape, a significant research gap persists. No comprehensive study has yet systematically evaluated Vietnam's regulatory system for investment and construction activities specifically concerning its effectiveness in promoting and supporting the sector's transition towards the national net-zero 2050 target. Existing analyses often focus on broader climate policy, energy transition, or specific technical aspects of green buildings, leaving the holistic assessment of the enabling regulatory environment for net-zero construction investment underexplored.

To address this knowledge gap, this study applies a structured, dual-framework approach to evaluate the alignment between Vietnam's regulatory system and its net-zero construction objectives. Specifically, the study employs the CETEx Framework and the OECD Framework for Industry's Net-Zero Transition to assess the regulatory foundations, policy coherence, institutional readiness, and financial linkages within Vietnam's construction sector. These frameworks were selected for their ability to capture both the regulatory effectiveness (CETEx) and the investment-enabling dimensions (OECD) of net-zero governance.

This paper pursues three main objectives:

To analyze the current regulatory system governing construction investments in Vietnam and its alignment with national net-zero goals;

To evaluate the system's effectiveness in supporting a net-zero transition in the construction sector, using international frameworks;

To identify regulatory gaps and propose targeted policy recommendations that can accelerate Vietnam's transition to a low-carbon built environment.

This analysis aims to contribute to the broader literature on regulatory governance for sustainable development, while also offering actionable insights for policymakers in Vietnam and other emerging economies navigating similar transitions.

The remainder of this paper is organized as follows: Section 2 provides the background and context of the study, outlining the regulatory system governing investment and construction activities in Vietnam, followed by

an overview of policies and regulations related to net-zero and associated topics. Section 3 offers a review of the literature on net-zero transitions in the construction sector, regulatory frameworks for sustainable development. Section 4 describes the research methodology, including the development and justification of the revised analytical framework for regulatory assessment. Section 5 presents the results of applying the framework to examine Vietnam's current regulatory landscape, Section 6 discusses the implications of the findings, emphasising critical areas for regulatory reform and policy intervention. Finally, Section 7 concludes the paper by summarising the main insights, underscoring the pivotal role of the regulatory system, and discussing potential future research on driving Vietnam's construction sector toward a sustainable, net-zero future.

2. Background and Context

Vietnam's legislative hierarchy, codified under Law No. 64/2025/QH15, establishes a structured system of 14 legislative document types (Table 1). The Constitution anchors this framework, with binding codes/laws from the National Assembly forming the primary statutory layer. Subsequent tiers—including government decrees, ministerial circulars, and local resolutions—operationalize national mandates while allowing contextual adaptation. Critically, this hierarchy enables vertical coherence but risks implementation fragmentation across administrative levels, particularly for cross-cutting goals like net-zero transition.

Table 1 *The system of legislative documents in Vietnam*

No	Types of legislative documents
1	The Constitution
2	Codes and laws (hereinafter referred to as "laws"), resolutions of the National Assembly
3	Ordinances, resolutions of the Standing Committee of the National Assembly; joint resolutions between the Standing Committee of the National Assembly and the Presidium of Central Committee of Vietnamese Fatherland Front; joint resolutions between the Standing Committee of the National Assembly, the Government and the Presidium of Central Committee of Vietnamese Fatherland Front
4	Orders, decisions of the President
5	Decrees, resolutions of the Government; joint resolutions between the Government and the Presidium
6	Decisions of the Prime Minister
7	Resolutions of the Council of Justices of the People's Supreme Court
8	Circulars of the Chief Justice of the People's Supreme Court; circulars of the Prosecutor General of the Supreme People's Procuracy; circulars of Ministers, Heads of ministerial agencies; Circulars of the State Auditor General
9	Joint circulars between the Chief Justice of the People's Supreme Court, the Prosecutor General of the Supreme People's Procuracy, the State Auditor General, Ministers, Heads of ministerial agencies
10	Resolutions of People's Councils of central-affiliated cities and provinces
11	Decisions of People's Committees of provinces
12	Legislative documents of local governments in special administrative - economic units
13	Resolutions of People's Councils of districts, urban districts, district-level towns, provincial-affiliated cities, central-affiliated cities
14	Decisions of People's Committees of districts

Source: [10]

Furthermore, Vietnam's construction investment regulatory system integrates 14 key specialized laws as its statutory foundation (Table 2), operationalized through government decrees and further specified by ministerial circulars. Collectively, these instruments establish a binding legal environment that defines sectoral processes, prescribes technical and environmental requirements, and provides implementation guidance across all project lifecycles and operational contexts.

Table 2 *The system of regulations for the investment and construction activities*

No	Code	Content
	Laws	
1	Investment Law No. 61/2020/QH14	Rules on investment procedures (licensing, environmental impact assessment, incentives)
2	Public Investment Law No 58/2024/QH15	Governs the management and use of public investment capital, outlining the responsibilities of state agencies, organizations, and individuals involved in public investment activities
3	Construction Law No. 50/2014/QH13	Regulates the construction investment processes, project management, design, construction, supervision, handover, warranty, and operation (amended by 62/2020/QH14 & 72/2023/QH15)
4	Law No. 62/2020/QH14 amending the Construction Law No. 50/2014/QH13	Amends and supplements the Construction Law No. 50/2014/QH13 to streamline administrative procedures, enhance construction quality management, and promote investment efficiency in construction activities
5	Law on State Budget No. 83/2015/QH13	Regulates the principles, management, use, and oversight of state budget revenues and expenditures in Vietnam
6	Law on Architecture No. 40/2019/QH14	Regulates the management, practice, rights and obligations of organizations and individuals in the field of architecture
7	Law on Land No. 31/2024/QH15	Rules on land management and use, rights and obligations of land users
8	Law on Housing No. 27/2023/QH15	Rules on owning, developing, managing, operating, using housing, housing transactions and state management of housing
9	Bidding Law (Law on Tendering) No. 22/2023/QH15	Regulates the selection of contractors for the provision of consulting services, construction, goods supply, EPC... for projects using state capital or state-originated capital
10	Law on Environment Protection No. 72/2020/QH14	Governs the environmental protection activities; rights, obligations and responsibilities of agencies, organizations, communities, households and individuals in environmental protection activities
11	Urban and Rural Planning Law No. 47/2024/QH15	Governs urban/rural planning formulation, approval, implementation, and adjustment
12	Fire Prevention, Fighting, and Rescue Law No. 55/2024/QH15	Regulates fire prevention, firefighting, and rescue operations, defining responsibilities, measures, and coordination mechanisms to ensure safety and protect people, property, and the environment.
13	Public-Private Partnership Investment Law No. 64/2020/QH14	Establishes a comprehensive legal framework for public-private partnership (PPP) investments, delineating the rights, obligations, and responsibilities of involved parties, and outlining the procedures for implementing PPP projects across various sectors.
14	Real Estate Business Law No. 29/2023/QH15	Regulates the real estate business and state management of real estate business
	Selected Decrees	
15	Decree 175/2024/ND-CP	Regulates the management of construction activities
16	Decree 10/2021/ND-CP	Regulates the management of construction investment cost
17	Decree 06/2021/ND-CP	Regulates the quality management, maintenance of construction works
18	Decree 50/2021/ND-CP	Regulates the construction contract
19	Decree 24/2024/ND-CP	Guidance on implementation of the Law on Tendering on selection of contractor
20	Decree 31/2021/ND-CP	Guidance on implementation of the Investment Law

For net-zero alignment, Vietnam has developed targeted policies across three key domains (Table 3): strategic frameworks such as *Decision 896/QD-TTg (National Climate Strategy)*, which establish sectoral carbon caps; technical regulations including the *TCVN ISO 14064-14068 series* that standardize carbon accounting methodologies for buildings; and sectoral mandates exemplified by *Circular 15/2017/TT-BXD* requiring energy-efficient designs and *Decision 802/QD-BXD* imposing GHG reduction targets on cement production.

However, persistent enforcement deficits—particularly for locally managed projects with inadequate monitoring capacity—undermine policy efficacy.

Table 3 *Net-zero transition related policies for construction*

No	Code	Content
1	Resolution 136/NQ-CP dated 25/9/2020 in sustainable development	Establishes Vietnam's comprehensive national framework for sustainable development, mandating cross-ministerial coordination to integrate environmental resilience, low-carbon transition, and socio-economic equity into sectoral policies
2	Decision 841/QD-TTg in dated 14/7/2023	Decision on promulgating the Roadmap for the implementation of Vietnam's sustainable development goals by 2030
3	Decision 687/QD-TTg dated 07/06/2022	Decision approving the project of developing circular economy in Viet Nam
4	Decision 179/QD-TTg dated 16/02/2024	Decision on approving the strategy for development of the construction sector to 2030, with orientation towards 2045
5	Decree 107/2022/ND-CP	Experimental transfer of emissions reductions and financial management under emissions reduction payment agreement in Northern Central region
6	Decree 06/2022/ND-CP	Mitigation of GHG emission and protection of ozone layer
7	Circular 25/2023/TT-BTNMT	National technical regulation on the process of establishing land cover datasets for calculating greenhouse gas emissions using optical remote sensing data
8	Circular 38/2023/TT-BCT	Methods for measurement, reporting, appraisal of reduction of green house gas (GHG) emissions in industry and trade
9	Circular 17/2022/TT-BTNMT	Methods for measurement, reporting, appraisal of reduction of green house gas (GHG) emissions and GHG inventory development in waste management
10	Circular 01/2022/TT-BTNMT	Regulates the implementation of the Law on Environmental Protection on climate change response
11	Circular 15/2017/TT-BXD	National technical regulations on energy efficient construction works.
12	Circular 01/2021/TT-BXD	National technical regulations on construction planning, regulations on efficient energy use and resource saving in urban planning.
13	Decision 802/QD-BXD dated 26/7/2017	Action plan to reduce greenhouse gas emissions in the cement industry to 2020, with a vision to 2030
14	Decision 385/QD-BXD dated 12/5/2022	Approving climate change action plan in the construction sector for the 2022 – 2030 period with vision towards 2050 to fulfill Vietnam's commitments in the 26th session of the conference of the parties to the UN framework convention on climate change (COP26)
15	Decision 2359/QD-TTg dated 22/12/2015	National Greenhouse Gas Inventory System
16	Decision 13/2024/QD-TTg	List of sectors and facilities emitting greenhouse gases that must conduct greenhouse gas inventories (updated)
17	Decision 280/QD-TTg dated 13/3/2019	National program on energy saving and efficiency for the period 2019 - 2030
18	Decision 896/QD-TTg dated 26/7/2022	National Climate Change Strategy to 2050: Targeting Net Zero Emissions Reduction by 2050
19	TCVN ISO 14067:2020	Greenhouse gas – Carbon footprint of products – Requirements and guidelines for qualification
20	TCVN ISO 14040:2009	Environmental management - Life cycle assessment - Principles and framework
21	TCVN ISO 14044:2011	Environmental management - Lite cycle assessment - Requirements and guidelines
22	TCVN ISO 14064-1:2025	Greenhouse gases - Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals

23	TCVN ISO 14064-2:2011	Greenhouse gases - Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions removal enhancements
24	TCVN ISO 14064-3:2011	Greenhouse gases - Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions
25	TCVN ISO 14068-1:2025	Climate change management – Transition to net zero – Part 1: Carbon neutrality
26	TCVN ISO 14083:2025	Greenhouse gases – Quantification and reporting of greenhouse gas emissions arising from transport chain operations

In brief, Vietnam's construction sector plays a pivotal role in advancing the nation's sustainable development and its ambitious transition to net-zero carbon emissions by 2050. The regulatory system and standards that govern this sector are foundational to these objectives, as they establish the framework for environmentally responsible urban growth, energy efficiency, and climate resilience. The country has established a robust and multi-layered system of legislative documents and regulations that guide investment and construction activities, placing a strong emphasis on sustainability and climate action. As outlined in Table 1, this system encompasses a hierarchy of laws, decrees, and circulars enacted by the National Assembly and relevant ministries. These legislative instruments provide the legal foundation for all construction-related activities, ensuring that environmental and climate considerations are embedded at every stage. Complementing this, Table 2 details the specific technical regulations, standards, and codes that operationalize the legislative framework. These include requirements for energy efficiency, building safety, and the use of sustainable materials, which are critical for aligning the sector with national and international climate commitments. The key policies—such as the National Green Growth Strategy, the National Strategy on Climate Change, and the National Program on Efficient Energy Use—are explicitly aligned with Vietnam's commitment at COP26 to achieve net-zero emissions by 2050. These policies, summarized in Table 3, set the strategic direction for the sector, mandating the integration of low-carbon and climate-resilient practices across all new developments.

In terms of sectoral climate action and implementation, a cornerstone of Vietnam's approach is the Ministry of Construction's Climate Change Action Plan (2022-2030, vision to 2050) [11], which serves as a pivotal sectoral pillar. This plan sets ambitious targets, including [11]:

- Reducing carbon emissions by at least 74.3 million tons of CO_2 equivalent.
- Increasing the number of green building certifications.
- Ensuring that by 2030, 25% of new urban areas comply with low-carbon construction standards.

In addition, the plan also mandates that 100% of new and renovated buildings adhere to energy-efficient building codes and promotes the accreditation of domestically produced green building materials. These measures are codified through standards such as QCVN 09:2017/BXD issued with Circular 15/2017/TT-BXD and its subsequent updates (if any), which incorporate energy efficiency requirements and are being expanded to address whole-life carbon limits and resilience criteria [12].

The regulatory framework supports the uptake of green building certifications—such as LOTUS, LEED, and EDGE—to reinforce adherence to sustainability standards. However, as highlighted in the relevant regulatory documents, the adoption of these certifications in public buildings remains limited, indicating a need for further regulatory reinforcement and incentives.

Vietnam's regulations are also driving a shift from a linear to a circular economy in construction. This is achieved by encouraging the use of recycled and sustainable materials (e.g., bamboo, low-carbon cement), prolonging material lifespan, reducing waste and emissions, and restoring ecosystems. Emerging standards for blended cement and the reuse of construction materials, as referenced in Table 2, are crucial for minimizing pollution, reducing resource consumption, and enhancing economic efficiency within the sector. With Vietnam's urbanization rate reaching over 50% by 2030 [13], the construction sector's regulatory system is instrumental in ensuring that new urban developments are sustainable and climate-resilient. By 2050, at least 50% of new urban areas and 10% of cities are expected to meet green urban area criteria, while a significant portion of public and commercial buildings will adhere to low-carbon standards, as set out in the sector's strategic plans [13].

The evaluation of Vietnam's construction investment regulatory system in the context of the net-zero transition is both timely and critical. The regulatory framework—including the Law on Environmental Protection 2020, the Green Growth Strategy, and sector-specific policies (see Tables 1–3)—provides a solid foundation for promoting sustainable construction practices. However, the effectiveness of these regulations in driving the sector toward net-zero remains uncertain, given persistent challenges such as energy dependency and financial constraints.

This study aims to assess how well Vietnam's regulatory system supports the adoption of sustainable practices in construction investments, identifying gaps and opportunities to enhance alignment with the country's

net-zero ambitions. By examining the interplay of policies, incentives, and market trends, this evaluation will contribute to a deeper understanding of the construction sector's role in Vietnam's broader climate strategy.

3. Literature Review

Evaluating the effectiveness of a national regulatory system in driving the construction sector towards net-zero emissions requires robust analytical frameworks. While no single framework is universally perfect or exclusively designed for this specific intersection (net-zero + construction investment regulation), several established and emerging approaches offer valuable lenses. This review synthesises key frameworks relevant to assessing how regulations promote and support the net-zero transition in construction investment and activities.

The imperative to achieve net-zero emissions by mid-century, as set out in the Paris Agreement, has catalyzed a global re-examination of regulatory systems across key sectors such as energy, transport, industry, and finance [14, 15]. Regulatory systems can either facilitate or hinder progress toward decarbonization, making robust evaluation frameworks essential for aligning policies with net-zero goals, supporting technological innovation, and addressing socioeconomic impacts [16, 17]. The complexity and interdependencies inherent in these transitions demand structured, adaptable approaches to policy evaluation and continuous improvement.

The CETEx Framework is considered as a leading evaluation framework for Net-Zero Transition. The CETEx framework is a sector-agnostic, practical tool designed specifically to guide policymakers and analysts in evaluating and refining regulatory systems for net-zero transitions [16]. It is built on three core building blocks:

- Foundations: Establishes baseline regulatory conditions, mapping existing policies, identifying gaps, and ensuring alignment with net-zero objectives. For example, this may involve assessing the presence and adequacy of carbon pricing or renewable energy standards.
- Adjusting Policies: Focuses on refining regulatory measures to address interdependencies and ensure coherence with net-zero targets. This includes streamlining permitting, updating performance standards, and introducing incentives for low-carbon technologies, as seen in the EU's Net-Zero Industry Act.
- Evaluation and Anticipation: Involves systematic assessment of policy effectiveness using metrics such as compliance rates, emission outcomes, and stakeholder feedback, while anticipating future challenges and opportunities.

A key strength of the CETEx framework is its emphasis on stakeholder engagement, bringing together policymakers, regulators, industry, and finance to ensure context-specific and effective regulatory action. Its modular approach allows application at different stages of policy implementation and across diverse sectors, such as assessing the impact of electric vehicle regulations in transport or green bond regulations in finance [16]. While the CETEx framework offers a foundational approach for policymakers to coordinate the net-zero transition, its application to industry-specific evaluations may be constrained by its generality, limited implementation guidance, and insufficient integration of equity considerations and dynamic adaptability. Addressing these shortcomings would enhance the framework's utility in guiding comprehensive and effective industry transitions toward net-zero emissions [16].

Another popular framework is the OECD's Framework for Industry's Net-Zero Transition. The OECD's framework offers a structured, five-step process tailored to the industrial sector but adaptable to other contexts [18]:

- Engaging stakeholders and agree on the focus area.
- Research the current technology, policy, and financing situation.
- Assessing the business case and identify low-carbon project pipelines.
- Developing market and financing solutions to close the transition gap.
- Dissemination of outcomes to stakeholders.

This framework stands out for explicitly integrating regulatory assessment with financial and technological dimensions, acknowledging that regulatory systems must align with market mechanisms to support effective transitions. Its emphasis on stakeholder engagement and adaptability to national and sectoral contexts makes it a robust and comprehensive tool for evaluating and enhancing regulatory systems. However, like the CETEx Framework, it has certain limitations. These include its broad, non-sector-specific approach, limited practical guidance for implementation, and a lack of strong integration of equity concerns and adaptability to rapidly evolving policy and technological landscapes [18].

The WWF's Red Flag Indicators Framework assesses the credibility, ambition, and governance of net-zero transition plans, emphasizing regulatory consistency and transparency . While the framework provides valuable climate-related indicators, it falls short in fully incorporating nature-based solutions—an increasingly essential aspect of sustainable construction. Additionally, its design primarily targets large corporations and financial institutions, potentially neglecting the distinct needs and operational capacities of small and medium-sized enterprises (SMEs), which are key contributors to the construction sector's transition to net-zero. The framework

also lacks sector-specific tailoring, failing to address the unique characteristics, challenges, and emissions profiles of the construction industry. Furthermore, it does not consider regional contexts, despite the fact that construction activities are deeply shaped by local regulations, climate conditions, and market dynamics—factors critical for effective, context-aware transition planning.

The Climate Action Tracker's Evaluation Methodology provides a typology for assessing national net-zero targets, focusing on governance, transparency, and policy alignment [20]. To rigorously evaluate the construction industry's net-zero transition, the Climate Action Tracker's core pillars—governance, transparency, and policy alignment— are adapted into actionable criteria [20]:

- Governance requires independent oversight bodies (e.g., sectoral climate commissions) to enforce binding targets, mandate annual audits of embodied and operational emissions, and impose penalties for non-compliance with decarbonization timelines (e.g., fossil fuel phaseouts in cement/steel production by 2040).
- Transparency demands public disclosure of all emission sources via digital material passports, verified Environmental Product Declarations (EPDs) for building materials, and real-time reporting of construction supply chain emissions (Scope 3), aligned with ISO 14025 and UNFCCC standards to eliminate loopholes like excluded imported carbon.
- Policy alignment ensures national net-zero strategies integrate construction-specific mandates, including: (1) legally binding building codes requiring zero-carbon operations and ≤50% embodied carbon in new structures by 2030; (2) equitable financing mechanisms for Global South adoption of low-carbon materials; and (3) science-based sectoral carbon budgets restricting carbon removal (CDR) to <10% of residual emissions, prioritizing direct reductions through electrification, circular material reuse, and fossil-free zoning laws.

The Climate Action Tracker's methodology exhibits critical gaps when assessing regulatory systems for net-zero transitions, primarily due to its exclusive focus on target design (e.g., scope, deadlines) while overlooking regulatory delivery mechanisms. It fails to evaluate implementation capacity (e.g., enforcement resources, compliance penalties), policy coherence (e.g., conflicts between fossil subsidies and carbon pricing), and innovation incentives (e.g., permitting barriers for green tech). Additionally, it neglects distributional equity impacts (e.g., energy poverty from carbon taxes) and subnational/cross-border governance (e.g., fragmented state-level enforcement or carbon leakage), creating a "paper target" risk where ambitions are rated highly despite unexamined execution flaws [20].

Modern Regulatory Impact Assessment (RIA) frameworks now systematically integrate net-zero transition criteria to rigorously evaluate proposed regulations, adapting OECD guidelines to quantify three critical dimensions [21]:

- Greenhouse Gas (GHG) Impacts via comprehensive carbon accounting—applying shadow carbon pricing (e.g., ≥\$100/tCO_2e by 2030) and lifecycle assessments to measure direct/indirect emissions across sectors, while mandating "carbon budgets" to ensure regulatory proposals align with national net-zero pathways;
- Innovation Potential through structured analysis of how regulations catalyze low-carbon technologies (e.g., scoring policies on their ability to de-risk investments in green hydrogen or circular material systems), including "innovation sandbox" provisions for pilot projects and dynamic standards that tighten incrementally (e.g., Euro 7 to Euro Zero for vehicles); and
- Social Equity Implications using distributional impact modeling to identify disproportionate burdens (e.g., energy cost spikes on vulnerable households) and embedding equity safeguards—such as targeted subsidies, just transition funds for fossil-dependent communities, and requirements for inclusive stakeholder consultations—to prevent regressive outcomes. This evolution transforms RIAs from cost-benefit tools into strategic enablers of net-zero governance, demanding multi-criteria decision matrices, transparent disclosure of climate trade-offs, and ex-post evaluations tracking real-world decarbonization efficacy against targets.

Modern RIAs exhibit critical shortcomings in supporting net-zero transitions, including inadequate carbon cost internalization through undervalued shadow prices (often below IPCC-recommended \$100–200/tCO_2) and exclusion of Scope 3/supply chain emissions; short-term bias in assessments (5–10 years), ignoring long-term climate risks and innovation benefits; weak innovation analysis that fails to model technology lock-in or tipping points; equity blind spots overlooking spatial/global disparities (e.g., impacts on vulnerable communities or Global South supply chains); governance fragmentation where climate impacts are siloed from socio-economic factors, with only 33% of OECD countries mandating RIAs for all climate rules; and overreliance on flawed cost-benefit analysis that discounts future damages and neglects non-market values (e.g., biodiversity). These gaps, compounded by data deficits and political pressures, risk legitimizing incremental policies, delaying transformative climate action [21].

The World Bank's Doing Business (DB) and Product Market Regulation (PMR) indicators can be recalibrated to evaluate net-zero regulatory barriers by creating new metrics that measure [22]:

- efficiency of green permitting (e.g., time/cost for renewable project approvals or retrofits, targeting ≤60-day processes like Portugal's "green lane");
- market accessibility for low-carbon solutions, adapting "Starting a Business" indicators to track licensing hurdles for clean energy SMEs and fossil subsidy distortions; and
- innovation enablers, such as grid modernization rules for distributed solar or circular economy licensing. However, critical gaps persist—including ignored carbon costs in construction permits, equity blind spots (e.g., delayed solar access in low-income areas), and failure to track dynamic policy tightening (e.g., annual efficiency standard upgrades)—requiring integration of shadow carbon pricing, equity scoring, and emission benchmarks to transform DB/PMR into actionable net-zero diagnostics [22].

The World Bank's DB and PMR indicators suffer from critical shortcomings in assessing net-zero regulatory systems due to their exclusive focus on business-friendliness (e.g., permitting speed, labor flexibility) while ignoring environmental and equity dimensions. They fail to measure regulations' climate impacts, such as carbon pricing stringency, fossil fuel subsidy bans, or green innovation incentives, and actively penalize "burdensome" environmental rules (e.g., emissions audits or renewable standards) as barriers to market efficiency. Their methodology also overlooks distributional equity (e.g., worker retraining for coal transitions) and prioritizes deregulation—potentially encouraging weaker climate safeguards. Crucially, DB/PMR lack metrics for systemic decarbonization (e.g., grid modernization, circular economy policies), reducing their utility for evaluating the regulatory coherence needed for 1.5°C alignment [22].

Regarding the sector-specific and cross-cutting frameworks, it is noted that there are a number of green building rating systems (e.g., LEED, BREEAM, LOTUS). Such building ratings systems and the building energy policy assessment frameworks, namely IEA/UNEP, provide methodologies for evaluating the stringency, coverage, and enforcement of building codes and energy efficiency standards [15, 23]. These frameworks can be expanded to include embodied carbon, renewable energy integration, and circularity principles. However, they may not be suitable for using as a framework for evaluating the regulatory system of the construction sector regarding net-zero transition, since they are not linked to the investment and construction regulations.

The literature underscores the necessity of structured, adaptable frameworks—such as CETEx and the OECD's—for evaluating regulatory systems in the net-zero transition. These frameworks provide actionable guidance for policymakers, enable continuous improvement, and support alignment with global climate objectives. As regulatory systems evolve, integrating sector-specific and cross-cutting evaluation methodologies will be essential for achieving effective, equitable, and ambitious net-zero transitions.

Recent literature highlights the importance of aligning regulatory frameworks with broader financial and governance mechanisms to support the net-zero transition, particularly in emerging economies like Vietnam.

First, green finance has emerged as a crucial enabler of climate mitigation efforts across ASEAN. According to the ASEAN Taxonomy for Sustainable Finance (2021), a regional classification system helps align public and private investments with sustainability objectives, offering a foundation for policy coherence across sectors [24]. Research by Yoshino, Lakhia [25] emphasizes how ASEAN's blended finance and green bond mechanisms can be harnessed to de-risk low-carbon infrastructure projects, particularly in countries with evolving investment environments like Vietnam. However, the adoption of green finance in Vietnam remains nascent and heavily dependent on international climate finance flows and bilateral partnerships [26].

Second, the regulation of embodied carbon in construction materials is gaining global traction, directly influencing regulatory development. The European Union's Carbon Border Adjustment Mechanism (CBAM), adopted in 2023, sets a precedent for regulating embodied emissions in imported materials such as steel and cement. Scholars [27, 28] argue that mechanisms like CBAM will exert indirect pressure on trading partners—including Vietnam—to adopt carbon reporting and pricing frameworks in their domestic supply chains. In the construction sector, such developments could accelerate the mainstreaming of Environmental Product Declarations (EPDs) and lifecycle carbon accounting tools, which are currently absent in Vietnamese regulatory guidance.

Lastly, decentralization presents both opportunities and constraints in implementing climate policies. In federal or quasi-federal systems, literature shows that local governments often lack the capacity or incentives to implement national climate strategies effectively [29]. In Vietnam's case, while decentralization is a formal policy commitment, coordination across central, provincial, and local agencies remains fragmented, as echoed by studies from the World Bank (2022) and UNDP Vietnam (2021), cited in Rana, Zhu [30]. This misalignment can undermine regulatory coherence and hinder the enforcement of low-carbon building codes or climate-resilient urban planning at the sub-national level.

4. Research Methodology

This research study will be conducted in four steps (Figure 1). First, suitable frameworks will be selected. Since every framework has its limitations, this study adopts two complementary approaches to ensure a more robust analysis. Second, international best practices will be gathered for benchmarking purposes. Third, the regulatory system governing the Vietnamese construction sector in relation to the net-zero transition will be evaluated using each framework. The results will be compared to identify key challenges and gaps in the current regulatory system. Finally, policy recommendations will be proposed to support future regulatory development.

Fig. 1 *The research process*

Based on the literature review, there are several frameworks that can be adopted for evaluating the regulatory system regulating the Vietnamese construction sector concerning net-zero transition. The two most suitable frameworks for evaluating Vietnam's Construction Investment Regulatory System Concerning Net-Zero Transition are:

- CETEx Framework
- OECD's Framework for Industry's Net-Zero Transition

The CETEx Framework is a purpose-built tool designed to evaluate regulatory systems within the broader context of net-zero transitions. It is structured around three key components—policy mapping, refinement, and evaluation—making it highly relevant for analyzing Vietnam's construction investment regulations. The framework places strong emphasis on stakeholder engagement, a critical feature in fragmented, multi-actor environments such as the construction sector. Its modular and adaptable design allows for application across different policy stages and sectors, ensuring flexibility and responsiveness to evolving regulatory and market conditions [16].

The OECD's Framework for Industry's Net-Zero Transition complements this by offering an integrated approach that addresses regulatory, financial, and technological dimensions—each highly pertinent to Vietnam's construction investment landscape. While originally tailored for industrial sectors, the framework is particularly suitable for construction, a hybrid domain spanning both industry and infrastructure. It provides clear, customizable steps for national implementation and acknowledges the urgent need to develop financing mechanisms—an area where many developing countries, including Vietnam, face substantial challenges in advancing low-carbon construction systems [18].

Table 4, 5 summarise the evaluation criteria/aspects for each framework for the evaluation.

Table 4 *CETEx framework's evaluation criteria*

No	Pillar	Evaluation Criteria
1	Regulation	- Mapping of existing regulations (e.g., Law on Construction, Law on Environmental Protection)
		- Identification of gaps (e.g., embodied carbon, circular economy)
		- Alignment with Vietnam's national net-zero strategy
2	Adjusting Policies	- Degree of integration of low-carbon technology incentives in investment approval processes
		- Simplification and alignment of permitting procedures for green buildings
		- Inclusion of carbon pricing or carbon budget mandates
3	Evaluation & Anticipation	- Emission outcomes of construction investment projects
		- Feedback from construction industry and local authorities
		- Anticipation of future trends (e.g., green finance, digital permits)

Source: Authors' adaptations from [16]

Table 5 *OECD framework's steps for evaluation*

No	Step	Evaluation Criteria
1	Stakeholder Engagement	- Inclusion of developers, ministries (MPI, MOC, MONRE), banks, and construction SMEs in planning processes
2	Research Current State	- Assessment of current permitting time, approval hurdles, and green finance access - Baseline GHG emissions from investment activities- Inclusion of carbon pricing or carbon budget mandates
	Business Case & Project Pipeline	- Existence of viable net-zero construction investment projects - Identification of barriers to scaling
4	Market & Finance Solutions	- Availability and design of green bonds, credit guarantees, or subsidy schemes - Integration of net-zero criteria into bankable project guidelines
5	Dissemination	- Transparency of regulatory changes - Availability of training and support tools for investors and builders

Source: Authors' adaptations from [18]

The results from the two approaches will be compared across several dimensions to provide a comprehensive assessment of Vietnam's construction investment landscape. The CETEx Framework offers a holistic analysis of the regulatory system, emphasizing the identification of gaps, policy coherence, and the streamlining of legal instruments. It evaluates outcomes based on emissions impact, regulatory compliance, and stakeholder feedback, while incorporating an adaptive, forward-looking perspective. In contrast, the OECD Framework focuses on sectoral readiness, integrating technological, financial, and policy factors. Its evaluation criteria include the robustness of project pipelines, success in securing financing, and the effectiveness of stakeholder engagement—typically oriented toward current to medium-term market alignment.

In practical terms, CETEx is well-suited for diagnosing and reforming Vietnam's construction-related legal and regulatory instruments, including permitting procedures and environmental assessments. The OECD Framework complements this by identifying and addressing implementation and investment gaps, linking regulatory objectives with bankability, financial incentives, and market readiness. Cross-comparing results from both frameworks—such as mapping policy provisions identified through CETEx against the market and financial enablers assessed by the OECD Framework—can reveal critical mismatches. This approach helps pinpoint areas where strong regulations lack adequate financial support, or where investment mechanisms exist without a solid regulatory foundation, thereby guiding more balanced and effective policy reforms.

5. Results

5.1 An Evaluation with the CETEx Framework

Vietnam has begun establishing a regulatory foundation to align its construction sector with the country's net-zero ambitions. This foundation comprises key government mandates, voluntary initiatives, and an expanding network of stakeholder collaboration. However, despite notable progress, significant policy and regulatory gaps persist—particularly in the areas of enforceable investment-level mechanisms and targeted financial incentives needed to accelerate the green transition in the built environment. The following presents the results of an evaluation of Vietnam's construction investment regulatory system in relation to the net-zero transition, using the CETEx Framework.

** Foundations: Regulatory framework and voluntary standards*

The cornerstone of Vietnam's climate policy framework is Decree No. 06/2022/ND-CP [31], which mandates a greenhouse gas (GHG) inventory system, monitoring, reporting, and verification (MRV) mechanisms, the establishment of a domestic carbon market, and sectoral mitigation plans leading up to 2030. This legal infrastructure provides a solid platform for integrating climate targets into various sectors, including construction. Complementing this regulatory effort is the Lotus Green Building Certification, developed by the Vietnam Green Building Council (VGBC) and endorsed by the Ministry of Construction since 2009. The Lotus system sets voluntary standards for energy efficiency, water conservation, and sustainable materials in buildings, helping promote environmental awareness in the construction sector [32].

Despite these foundations, critical gaps persist. Vietnam's Construction Investment Law and related approval processes do not currently include explicit requirements for assessing embodied carbon emissions or setting project-level carbon budgets [27]. Additionally, while the Lotus certification promotes green practices, it remains a voluntary tool, and is not integrated into mandatory construction permitting or investment licensing.

** Adjusting policies: Toward legal integration and incentives*

Recent policy developments show intent to strengthen green standards, but challenges in implementation persist. In February 2024, Decision No. 179/QD-TTg called for the promotion of green building materials and the reduction of energy consumption in infrastructure development. While this is a notable step forward, it lacks binding power in the context of construction permitting and investment approvals. On the incentives front, Vietnam is preparing for the launch of a carbon market, expected to include mechanisms such as carbon credits and cap-and-trade schemes by 2028 [33]. However, as of mid-2025, no specific fiscal incentives—such as tax reductions, fast-track permits, or lower administrative fees—are in place to directly encourage investment in green or low-carbon construction projects.

** Evaluation and forward-looking measures*

As part of its MRV efforts, Decree 06 mandates annual sectoral mitigation plans from 2023 to 2025 [31]. These plans provide a mechanism for monitoring emissions trends and assessing policy impact across industries, including construction. The voluntary Lotus certification has also shown promising uptake, with over 500 certified green buildings totaling more than 12 million square meters as of Q3 2024 [34]. This trend reflects growing market awareness and interest, though further action is required to institutionalize this trend into widespread transformation.

Stakeholder collaboration is also advancing. In March 2025, a Memorandum of Understanding (MoU) was signed between the Vietnam Green Building Council and global consultancy Arup, aimed at enhancing the deployment of sustainable building practices in Vietnam [35]. Moreover, recent administrative reforms targeting the carbon market approval process aim to simplify procedures—an encouraging sign of policy adaptability [36].

In summary, Vietnam is making meaningful strides toward a regulatory framework that supports sustainable construction and carbon reduction. Key legal instruments, such as Decree 06, and voluntary schemes like the Lotus certification, have laid the groundwork. However, the absence of mandatory investment-level requirements—such as carbon budgets in permitting processes or targeted financial incentives—continues to limit large-scale transformation. Moving forward, integrating binding sustainability criteria into construction approvals and providing fiscal incentives for green development will be essential to achieving Vietnam's net-zero goals in the built environment [37].

5.2 An Evaluation with the OECD Framework

Vietnam is progressing toward its climate commitments, including the net-zero target by 2050, by reinforcing regulatory foundations and green practices in the construction sector [38]. However, when evaluated using the OECD framework—which focuses on five pillars: stakeholder engagement, evidence-based analysis, business case development, market mechanisms, and dissemination—gaps emerge that may hinder the transition to a low-carbon built environment.

** Stakeholder engagement: Inclusive but fragmented*

Vietnam's construction decarbonization landscape features several active institutional players. The Ministry of Construction, in collaboration with the Vietnam Green Building Council and international consultants like Arup, has been instrumental in promoting sustainable building practices and standards [34]. These organizations contribute to capacity building, pilot projects, and thought leadership.

However, broader stakeholder inclusion remains limited. Developers, small and medium-sized enterprises (SMEs), and financial institutions—critical actors in scaling up low-carbon construction—are not yet systematically engaged. Although banks like MSB (Maritime Bank) have introduced green financing products, there is no formalized, cross-sectoral platform to align these stakeholders with national net-zero goals or coordinate green construction investment [39].

** Research and evidence base: Progress with gaps*

Vietnam has made strides in establishing a regulatory evidence base. Under Decree No. 06/2022/ND-CP, the government mandates greenhouse gas (GHG) inventories and monitoring, reporting, and verification (MRV) systems across sectors [31]. In parallel, VGBC tracks green building adoption through the Lotus certification system, which, as of Q3 2024, includes over 500 certified buildings covering more than 12 million square meters [34].

Yet, important data gaps persist. There is no public disclosure of embodied carbon emissions, which are critical in assessing life-cycle impacts of construction materials [40]. Additionally, the government has not published a pipeline of planned decarbonization investment projects or associated mitigation potential in the sector.

** Business case and Investment pipeline: Early signals but incomplete*

The presence of hundreds of certified green buildings suggests increasing demand for sustainable construction, especially in urban centers [41]. This reflects a growing awareness of energy efficiency and environmental performance in the real estate market. However, a compelling business case for sector-wide decarbonization has yet to be developed. There is no systematic bottleneck analysis identifying barriers to scaling

up net-zero construction, such as cost premiums, labor skill gaps, or regulatory delays [42]. Likewise, financial feasibility assessments for low-carbon construction technologies or materials remain underdeveloped, limiting investor confidence and strategic planning [43].

** Market and financial mechanisms: Emerging but nascent*

Some early-stage financial instruments and market mechanisms are in place. The Lotus certification creates market signaling for green buildings, and the upcoming national carbon market includes carbon credit trading as outlined in Decree 06/2022. Additionally, MSB's green finance offerings demonstrate a positive shift in private-sector engagement [44].

Nevertheless, Vietnam lacks a national green finance strategy tailored to the construction sector. There is no dedicated green bond framework, loan guarantee scheme, or investment subsidies specifically designed to encourage low-carbon building practices [45]. This absence of targeted financial instruments limits the ability of developers—especially SMEs—to access affordable capital for sustainable projects [46].

** Dissemination and Transparency: Efforts Underway but Limited Access*

Vietnam's MRV system and the VGBC's disclosure of Lotus-certified buildings contribute to improved public transparency. In parallel, efforts to digitize permit procedures and reduce administrative burdens are underway, signaling the government's willingness to modernize [47].

However, dissemination of knowledge and investment guidance remains fragmented. There is no centralized information portal or investor roadmap to support decision-making, particularly for smaller firms unfamiliar with the regulatory and financial landscape [48]. This limits broader participation and reduces the visibility of climate-aligned construction opportunities.

In summary, Vietnam has built a foundational framework for aligning its construction sector with net-zero ambitions, supported by strong government direction, institutional engagement, and early market signals. However, when evaluated through the OECD lens, the sector lacks a coherent investment pipeline, comprehensive financial tools, and a structured multi-stakeholder engagement mechanism.

5.3 A Comparative Summary Using the Two Frameworks

A comparative summary of the results obtained using the two frameworks is presented in Table 6.

Table 6 *OECD framework's steps for evaluation*

Aspect	CETEx Framework	OECD Framework
Regulatory mapping	Strong (MRV, standards)	Moderate (needs project-level analysis)
Policy coherence & incentives	Weak in permit level mandates	Weak in financing instruments
Stakeholder engagement	Growing (policymakers, VGBC, NGOs)	Limited—absent structured forums for investors/finance
Measurement & evaluation	MRV and Lotus counts exist	Lacks project pipelines and business case evidence
Adaptability & finance linkage	Carbon market ready by 2028	No green bonds or blended finance for construction transition

The evaluation of Vietnam's construction sector through the CETEx and OECD frameworks reveals a dual reality: encouraging progress alongside critical gaps. On one hand, the CETEx assessment highlights that Vietnam has established a solid regulatory foundation, underpinned by government mandates, voluntary green building initiatives, and growing institutional engagement. These elements indicate a positive trajectory toward aligning construction practices with the nation's net-zero goals.

However, the next phase of progress requires embedding net-zero principles directly into the legal and procedural core of construction investment. This includes integrating carbon budgeting, embodied carbon limits, and net-zero compliance requirements into investment laws and permitting processes.

The OECD framework further underscores the need for financial and institutional innovation. While overarching policies are in place, Vietnam must now prioritize the development of robust financial instruments—such as green bonds, concessional loans, and loan guarantees—to mobilize capital at scale. Equally important is the creation of formal project pipelines and multi-stakeholder investment platforms to improve transparency, attract investors, and coordinate long-term planning.

In sum, Vietnam's path to a net-zero construction sector is within reach—but requires a strategic pivot from policy intent to implementation, from voluntary measures to binding incentives, and from isolated initiatives to integrated, finance-ready systems.

6. Discussion

The focus of the discussion is the maturity and readiness of Vietnam's Construction Industry for Net-Zero Transition. Five aspects have been drawn out for disscussion below: regulatory maturity, policy adjustment and institutional readiness, Market Readiness and Financial Enablement, Stakeholder Coordination and Adaptive Governance and Strategic Vision vs. Operational Execution. Figure 2 shows the general evaluation of the aspects.

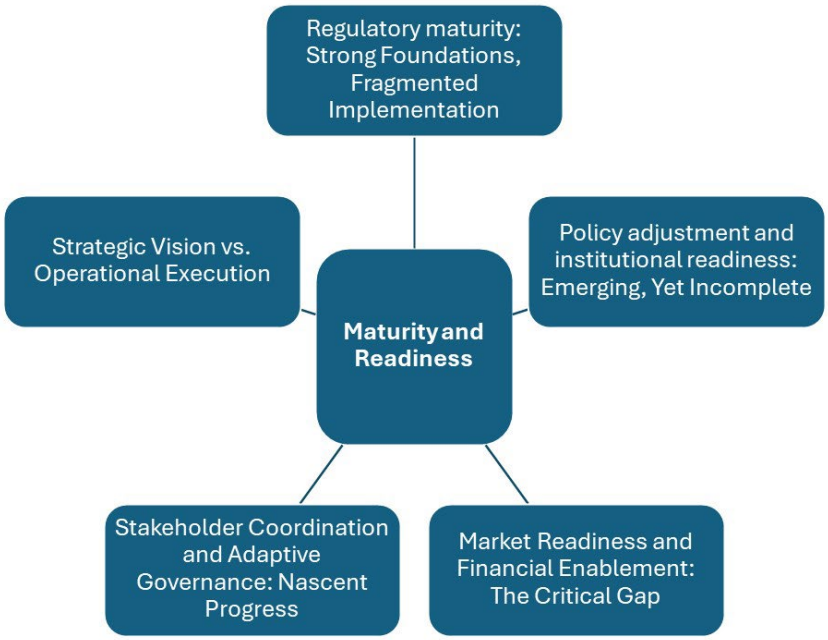

Fig. 2 *The maturity and readiness of the Vietnames construction industry for net-zero transition*

6.1 Regulatory Maturity: Strong Foundations, Fragmented Implementation

Vietnam has built a multi-layered regulatory structure that aligns national climate commitments with the legal governance of construction investment. Key laws—such as the Law on Environmental Protection (No. 72/2020/QH14), Construction Law (No. 50/2014/QH13, amended by 62/2020/QH14), and sector-specific decrees (e.g., Decree 06/2022/ND-CP on GHG reduction)—form the legal backbone of the transition framework. Additionally, technical standards such as the TCVN ISO 14064 and 14067 series provide recognized methodologies for carbon accounting, supporting robust policy design and measurement (see CETEx "Foundations" analysis) [49, 50].

However, the CETEx evaluation revealed that binding regulatory requirements for carbon performance at the project approval stage remain largely absent. For instance, while Circular 15/2017/TT-BXD mandates energy efficiency in buildings, there is no requirement in investment approval processes to assess or limit embodied carbon or to assign project-specific carbon budgets [12]. Moreover, most standards, including green building certifications like LOTUS, are voluntary and not systematically embedded into mandatory construction permitting or tendering criteria.

This results in a vertical coherence in regulation—anchored by national laws—but significant horizontal fragmentation in implementation across provinces and project types. Locally managed projects, in particular, suffer from insufficient capacity to enforce energy or carbon standards, leading to uneven outcomes and limited policy impact at scale (CETEx "Evaluation & Anticipation").

6.2 Policy Adjustment and Institutional Readiness: Emerging, Yet Incomplete

Vietnam's policy landscape shows growing institutional awareness and willingness to adapt regulations for net-zero alignment. The Construction Sector Development Strategy to 2030, vision to 2045 (Decision 179/QD-TTg), and Climate Change Action Plan (Decision 385/QD-BXD) set clear targets for low-carbon construction practices, including increasing green building certifications, applying energy-efficient standards to 100% of new buildings, and promoting green building materials [11, 13].

In the CETEx "Adjusting Policies" analysis, these developments indicate positive signals for regulatory innovation. Yet, the policies lack enforceability at the project level due to insufficient legal triggers and limited compliance incentives. For example, there are no streamlined permitting pathways, reduced timelines, or cost

incentives for low-carbon construction—tools that have proven effective in other jurisdictions to catalyze green building adoption.

Furthermore, while Vietnam is developing a domestic carbon market (to be operational by 2028 under Decree 06/2022/ND-CP), there is currently no link between investment permitting and future carbon market mechanisms—a disconnect that undermines market-readiness and slows private sector mobilization.

6.3 Market Readiness and Financial Enablement: The Critical Gap

The OECD framework evaluation underscores a key deficiency: the lack of financial and market mechanisms tailored to support net-zero construction investment. Although Vietnam has made progress in establishing MRV systems and supporting green certifications (e.g., over 500 buildings certified under LOTUS by 2024), the country still lacks:

- Dedicated green bond frameworks for construction.
- Public or blended finance programs targeting low-carbon building projects.
- Structured project pipelines backed by technical and financial feasibility assessments.

In the OECD framework's stages 3 and 4 (business case and market solutions), Vietnam falls short in translating policy ambition into bankable low-carbon projects. While some private financial institutions, like MSB, are beginning to support green projects, the absence of systemic financial de-risking instruments—such as loan guarantees or concessional rates—limits the scalability of net-zero construction (OECD Stage 4).

Moreover, there is currently no national platform to disseminate investment-ready green construction models, best practices, or tools for SMEs—despite their central role in Vietnam's construction ecosystem (OECD Stage 5). This restricts knowledge transfer, investor confidence, and private sector alignment with public climate goals.

6.4 Stakeholder Coordination and Adaptive Governance: Nascent Progress

Both frameworks point to growing stakeholder engagement, particularly from the Ministry of Construction, international donors, and NGOs like the Vietnam Green Building Council. The collaboration between Arup and VGBC in 2025, and the involvement of UNEP and IEA in technical guidance, demonstrate increasing multi-actor engagement (CETEx "Stakeholder Engagement"; OECD Stage 1).

However, engagement remains largely informal and policy-oriented, rather than institutionalized into multi-stakeholder regulatory or investment coordination bodies. There is also a lack of structured channels for private sector feedback or subnational adaptation of regulations—essential for building the dynamic, iterative governance systems needed to manage transition uncertainties and technological change.

Additionally, Vietnam's regulatory impact assessments (RIAs) have not yet integrated climate criteria systematically. They lack modeling tools for evaluating long-term decarbonization impacts, innovation potential, or distributional equity—an essential gap given the construction sector's spatial and socio-economic diversity.

6.5 Strategic Vision vs. Operational Execution

Strategically, Vietnam is aligned with global climate targets, particularly through the National Climate Change Strategy to 2050, which explicitly includes construction and infrastructure [51]. Policy targets—such as having 25% of new urban areas comply with low-carbon standards by 2030, and 50% of new urban areas by 2050—demonstrate a clear long-term commitment.

Yet, as both frameworks show, these goals risk becoming "paper targets" without:

- Binding legal integration into construction investment rules;
- Performance-linked financing mechanisms;
- Transparent monitoring systems with independent oversight.

6.6 Challenging Gaps in the Regulatory System

The practices have revealed key challenges in the regulatory system regulating the Vietnamese construction sector regarding the net-zero transition (Figure 3).

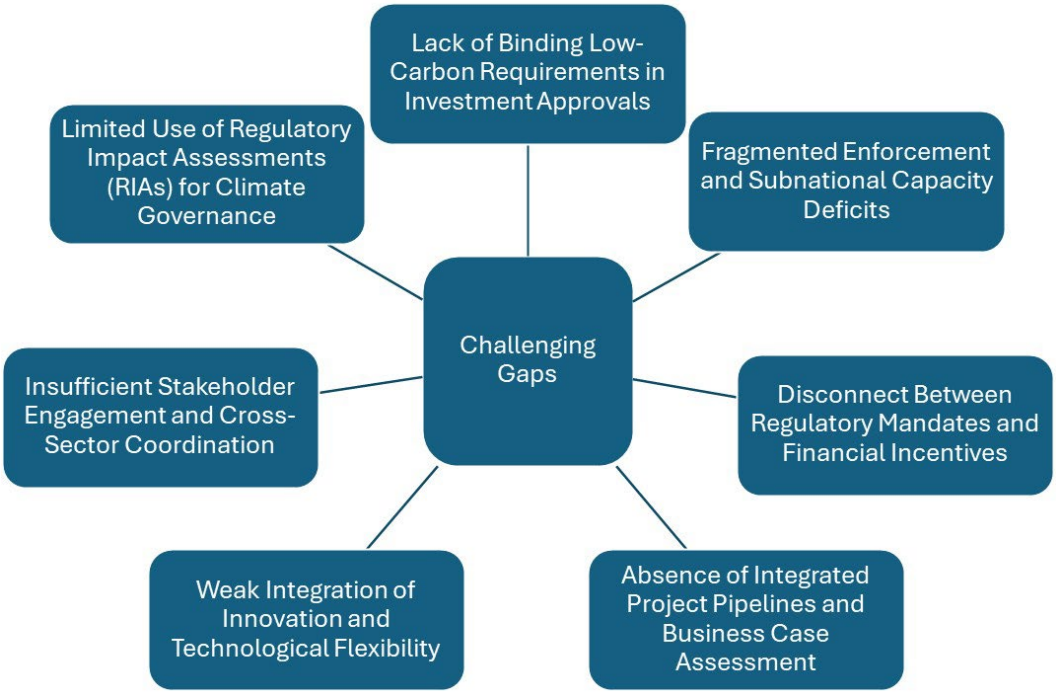

Fig. 3 *The identified challenging gaps of the Vietnamese construction industry for net-zero transition*

** Lack of Binding low-carbon requirements in investment approvals:*

While Vietnam has enacted a wide range of climate-related laws and sectoral policies (e.g., Law on Environmental Protection No. 72/2020/QH14, Circular 15/2017/TT-BXD), these instruments have not been fully embedded in the project approval process for construction investments. Existing regulations emphasize environmental assessments and energy efficiency in building design, but they do not:

- Mandate carbon budgeting or embodied carbon limits for construction projects;
- Require life-cycle carbon assessments during project licensing;
- Enforce any legally binding emissions thresholds tied to investment permitting.

As identified in the CETEx "Foundations" and "Adjusting Policies" components, this regulatory gap allows high-carbon projects to proceed unchecked, undermining the effectiveness of national climate strategies.

** Fragmented enforcement and subnational capacity deficits:*

Although the national legislative system is vertically coherent (anchored by the Constitution and national laws), there is limited horizontal coordination and consistency in implementation across provinces and cities. Subnational authorities—who are often responsible for applying construction investment and permitting laws—frequently lack technical capacity, financial resources, and staff training to enforce climate-related regulations.

This leads to:

- Uneven application of green building codes;
- Inconsistent enforcement of MRV and environmental impact assessment protocols;
- Limited oversight of GHG reduction plans in locally approved construction projects.

The CETEx "Evaluation and Anticipation" pillar flags this as a critical bottleneck in achieving effective regulatory delivery.

** Disconnect between regulatory mandates and financial incentives*

One of the most pressing challenges identified in the OECD framework evaluation is the absence of fiscal and financial mechanisms embedded in the regulatory system to incentivize low-carbon construction. While policies like Decree 06/2022/ND-CP and Decision 385/QD-BXD lay the groundwork for decarbonization, they do not:

- Provide tax incentives, subsidies, or preferential financing for green building projects;
- Offer blended finance schemes or green public procurement requirements;
- Create fast-track permitting processes for certified low-carbon or energy-efficient projects.

Without these mechanisms, developers—especially SMEs—have limited motivation or capacity to invest in higher-cost green materials or technologies, even when such investments would contribute to national climate goals.

** Absence of integrated project pipelines and business case assessment*

Vietnam currently lacks a centralized system for identifying, evaluating, and publishing investment-ready net-zero construction projects. The OECD framework's stages 2 and 3 emphasize the importance of:

- Project pipelines with GHG and financial data;
- Cost-benefit analyses of decarbonized infrastructure;
- Feasibility studies for green urban developments.

While some green projects are emerging (e.g., 500+ Lotus-certified buildings), there is no national registry or structured pipeline to coordinate investments, match them with financing instruments, or monitor cumulative impact. This gap inhibits the visibility, scale-up, and replication of successful low-carbon construction models.

** Weak integration of innovation and technological flexibility*

The current regulatory system lacks provisions that actively promote or de-risk innovation, such as:

- Innovation "sandboxes" for testing green materials or circular construction models;
- Dynamic standards that evolve over time (e.g., performance-based building codes);
- Public R&D funding or regulatory allowances for demonstration projects.

As identified in both framework evaluations, technological stagnation and risk aversion in the regulatory environment may lead to path dependency, where outdated materials and construction processes remain entrenched, locking in high emissions.

** Insufficient stakeholder engagement and cross-sector coordination*

Although the Ministry of Construction and select NGOs (e.g., VGBC) have taken the lead in advancing green building standards, formal, multi-stakeholder governance mechanisms are still missing. The CETEx framework emphasizes the need for:

- Cross-sectoral engagement platforms (government, finance, construction firms, researchers);
- Inclusive feedback mechanisms to revise and improve policies;
- Coordination bodies that align construction policies with industrial decarbonization, urban planning, and national GHG targets.

At present, key stakeholders—especially local developers, commercial banks, and urban planners—are not adequately represented in policy formulation or evaluation processes, creating a disconnect between regulation, investment, and implementation.

** Limited use of Regulatory Impact Assessments (RIAs) for climate governance*

Modern Regulatory Impact Assessment (RIA) practices in Vietnam do not yet consistently apply climate-focused metrics. Key shortcomings include:

- Lack of shadow carbon pricing in evaluating new construction regulations;
- Absence of long-term decarbonization modeling or scenario planning;
- Failure to assess distributional equity impacts, such as affordability and energy poverty risks in green housing policies.

These gaps risk legitimizing incremental or even counterproductive regulations, as decisions are made without understanding their broader emissions, innovation, or social implications (Table 7).

Table 7 *Summary of key gaps*

Category	Identified Gaps
Legal Integration	No mandatory carbon limits or assessment in construction permits
Enforcement	Weak subnational capacity; inconsistent local application
Financial Mechanisms	No subsidies, green loans, or tax breaks embedded in construction regulations
Investment Pipeline	No project registry or national platform for green construction investment
Innovation Enablement	No regulatory sandbox, dynamic standards, or public R&D support
Stakeholder Coordination	Lack of institutionalized platforms for public–private–NGO collaboration
Climate-Sensitive RIAs	Climate risks, equity, and innovation not integrated into impact assessments

Source: Authors

In sum, Vietnam's construction investment regulatory system reflects strong strategic alignment with net-zero ambitions, but remains constrained by structural and operational gaps. The absence of enforceable low-carbon mandates, integrated financing tools, and robust implementation mechanisms creates a significant risk of policy ineffectiveness or partial compliance. Closing these gaps requires a multi-pronged reform effort—combining legal mandates, financial de-risking, institutional coordination, and climate-smart evaluation tools—to ensure the construction sector becomes an active driver, not a laggard, in Vietnam's journey to net-zero.

6.7 Policy Recommendations

Building on the regulatory assessment conducted using the CETEx and OECD frameworks, this section presents targeted policy recommendations to enhance Vietnam's construction investment regulatory system and support its alignment with the national net-zero transition. These recommendations respond to key legal, institutional, financial, and operational gaps, and are structured around five strategic priorities. While Vietnam's regulatory system has laid a solid strategic foundation for a net-zero future, accelerating progress will require a new generation of regulatory tools—project-level, enforceable, financially supported, adaptable to change, and inclusive of diverse stakeholders. These recommendations are critical not only to meet Vietnam's international climate commitments but also to build a more resilient, competitive, and sustainable construction sector.

6.7.1 Institutionalize Low-Carbon Mandates in Investment and Permitting Regulations

Vietnam should explicitly integrate net-zero criteria into investment licensing and construction approval processes. This can be achieved by:

- Amending the Construction Law and Investment Law to require:
  - Lifecycle carbon assessments (both operational and embodied carbon) as a prerequisite for major construction projects.
  - Submission of GHG mitigation plans aligned with sectoral carbon budgets.
- Embedding green building performance requirements (e.g., energy use intensity limits, carbon caps) into:
  - Decree 06/2021/ND-CP (Quality Management)
  - Decree 10/2021/ND-CP (Construction Costs)
- Mandating carbon budget thresholds or requiring compliance with certified standards (LOTUS, LEED, EDGE) for all public buildings and urban projects above a certain scale.

Impact: Strengthens the legal enforceability of climate objectives at the project level and ensures all new construction supports the net-zero trajectory.

6.7.2 Establish Incentive-Based Regulatory Mechanisms and Green Finance Instruments

To reduce the cost barrier of low-carbon construction and stimulate market transformation, Vietnam should implement the following:

- Launching a green permitting scheme, offering:
  - Fast-track approvals, fee waivers, or tax reductions for projects meeting verifiable green construction standards.
- Creating a national green building fund, co-financed by public and development finance sources, to provide:
  - Concessional loans, credit guarantees, and performance-based subsidies for certified green projects.
- Issuing of sovereign or municipal green bonds dedicated to urban development and climate-resilient infrastructure.
  - Expand existing carbon market policies (per Decree 06/2022/ND-CP) to include:
  - Tradable carbon credits linked to low-emissions construction practices and material reuse.

Impact: Provides tangible financial incentives to shift developer behavior and aligns capital flows with climate priorities.

6.7.3 Build Implementation Capacity and Local Enforcement Mechanisms

To improve regulatory effectiveness at the subnational level, Vietnam should:

- Developing and rolling out standardized enforcement toolkits for provincial and district-level authorities, including:
  - Digital MRV templates, permitting compliance checklists, and carbon accounting calculators.
- Investment in training programs for local officials, inspectors, and permitting authorities on:
  - Green building codes, GHG assessment, and environmental safeguards.

- Establishment of technical support units or "green construction helpdesks" at the provincial level to assist SMEs and developers.

Impact: Enhances consistency and capacity in enforcement, closing the current gap between policy design and real-world implementation.

6.7.4 Create an Integrated Green Construction Project Pipeline and Data Platform

To improve investment visibility and attract finance, Vietnam should:

- Developing a National Net-Zero Construction Investment Portal, hosted by the Ministry of Construction or MPI, to:
  - List of certified or pipeline projects aligned with climate goals.
  - Providing open access to MRV data, green finance programs, and technical standards.
- Requiring all projects applying for state funding, PPP, or concessional support to publish:
  - Emissions data (Scope 1, 2, and key Scope 3 sources);
  - Circular material use plans and waste reduction targets.

Impact: Facilitates project financing, transparency, and knowledge-sharing, while signaling strong government commitment to investors.

6.7.5 Strengthen Governance, Innovation, and Adaptive Policy Cycles

Vietnam should evolve its regulatory governance to become more dynamic and inclusive by:

- Establishing a National Multi-Stakeholder Task Force on Net-Zero Construction, including:
  - Ministries (MoC, MONRE, MPI), financial institutions, construction firms, academic/research bodies, and civil society.
- Institutionalizing climate-smart Regulatory Impact Assessments (RIAs), requiring:
  - Quantitative evaluation of GHG impacts, innovation potential, and equity considerations in all new construction-related policies.
- Introducing regulatory sandboxes and dynamic standards:
  - Allowing pilot projects using emerging materials (e.g., low-carbon cement, bamboo), adaptive design, and smart energy systems.

Impact: Supports continuous regulatory improvement, de-risks innovation, and embeds climate science and stakeholder input into policy formulation.

7. Conclusion

As Vietnam charts its path toward achieving net-zero emissions by 2050, the construction sector emerges as both a challenge and an opportunity. This study set out to examine the country's construction investment regulatory system through the lens of climate ambition—asking whether the existing legal and policy frameworks are ready to support such a transformative goal. The findings reveal a system that has made strategic strides, yet still faces significant operational hurdles.

At present, Vietnam lacks binding regulations that require net-zero considerations in construction investment decisions. Policies such as the Climate Change Strategy to 2050 and voluntary standards like the Green Building code are in place, but their influence stops short of the project level. The construction phase—despite its heavy carbon footprint—remains largely overlooked in current emissions-reduction frameworks.

Fragmentation is another challenge. While national laws are generally well-developed, their enforcement at the local level is inconsistent. Many subnational authorities lack the technical and institutional capacity to ensure compliance with green standards, leading to a patchy landscape of implementation across the country.

Financial support mechanisms are also notably absent. Despite policy momentum, there are no dedicated instruments such as green bonds, tax incentives, or subsidies to help de-risk low-carbon construction investments. Even promising tools like the upcoming carbon market remain disconnected from the investment approval process, limiting their practical impact.

Yet there are early signs of change. Voluntary certifications like LOTUS have sparked interest in green building, with more than 500 certified structures by 2024. But this still represents less than 1% of total construction nationwide—a clear signal that voluntary approaches alone will not suffice. Stronger regulatory mandates are needed to scale these early gains into sector-wide transformation.

Why does this matter? The construction sector accounts for roughly 18% of Vietnam's national emissions. Without immediate action to embed low-carbon requirements into the regulatory system, the country risks locking in high-emission infrastructure for decades to come. This study highlights critical levers available to policymakers—from tightening legal mandates to integrating climate finance and strengthening enforcement.

However, the research is not without its limitations. The focus was limited to construction investment regulations, leaving out key upstream sectors like cement and steel that contribute heavily to embodied carbon.

The methodology relied on content analysis of laws and policies, and did not incorporate primary data from developers or regulators. In addition, Vietnam's fast-evolving regulatory environment—such as the carbon market rollout—means that the situation may shift quickly beyond the study's June 2025 timeframe.

Looking ahead, future research should broaden the scope to include material production and energy inputs, while also exploring implementation on the ground. Interviews, surveys, and financial modeling could yield deeper insights into what enables or hinders green construction in practice. Benchmarking carbon emissions across the building lifecycle and studying international best practices would also help Vietnam build a more robust regulatory framework.

In closing, Vietnam has laid a strategic foundation for a net-zero construction future—but strategy alone is not enough. Real progress will depend on turning that vision into enforceable, financed, and localized action. As the country continues to urbanize and invest in infrastructure, the choices made now will determine whether the construction industry becomes a driver of climate resilience or a source of long-term carbon lock-in. This study offers a roadmap to help steer the sector toward the former—toward a future where construction investment aligns with the nation's sustainability ambitions.

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Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

The authors confirm contribution to the paper as follows: ***study conception and design:*** *VTD, DAB, DPN;* ***data collection:*** *VTD, DAB, DPN;* ***analysis and interpretation of results:*** *VTD;* ***draft manuscript preparation:*** *VTD, DAB, DPN. All authors reviewed the results and approved the final version of the manuscript.*

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