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The situation and solutions to develop Green Building in Vietnam

Housing in Vietnamese megacities is quite expensive due to limited land availability. Besides, green housing investment requires higher implementation costs than non-green housing investments, plus a Green Building certification fee implemented by international organizations. Despite specific difficulties and problems, green real estate projects bring economic benefits to both investors and users in the long run.

Green building development is a trend that is particularly interested in by governments and real estate developers. Through analyzing the current status of Green Building development in Vietnam, the authors have discovered barriers, limitations, and proposed solutions.

To develop green buildings effectively, investors need to operate a 5-step process throughout the project life cycle, including Green planning — Green design — Green construction — Green operation — Green lifestyle. Using environmentally friendly materials, energy-saving efficiency in green housing is no longer an unattainable dream for urban residents in Vietnam.

Keywords: green construction, green building, real estate, green real estate

INTRODUCTION

Integration with the world's development trend of using environmentally friendly materials, efficient energy use, and sustainable development, Vietnamese consumers are increasingly interested in a healthy and green lifestyle. Vietnam is an emerging and dynamically developing economy in the Asia-Indian Ocean, attracting intensely foreign investment sources.

Economic development and industrial production have undesirable consequences on living environment, especially environmental pollution in big cities where the population concentrates and high traffic density. The housing demand increases, while the ability to respond is limited. Although construction costs are high and the land is expensive and scarce, having a green place is always everyone's desire. Green Building investment costs are still required higher than non-green buildings. With these difficulties, so how is Green Building development in megacities feasible?

However, a rapidly growing young population and increasing people's incomes will have a positive impact on the development of the green real estate market in urban areas in Vietnam.

2. LITERATURE REVIEW

According to many experts, Green Building development in the world and Vietnam is massive. Despite facing many difficulties and challenges, Vietnamese developers have recently developed real estate projects with many green elements and energy efficiency. To minimize the impact of climate change and sustainable development, Vietnam received support from many international organizations such as UNDP, IFC, Organization for Development Cooperation of Germany (GIZ) on consultants using energy saving and efficiency, contributing to reducing greenhouse gas emissions.

IFC is a member of the World Bank Group forecast that in the near term, through 2025, Green Building has a \$3.4 trillion investment potential. The investment opportunity summary for Vietnam \$ 2.16 trillion for Commercial, \$ 20.0 trillion for Residential, and 260,000 Residential Units [1].

IFC has a strategy to promote global green finance for the project, including a four-part process: 1) Investment & Advisory for Banks; 2) Investment & Advisory for Building Sector; 3) Green building Codes & Incentives; 4) EDGE Certification [1].

According to the Vietnam Green Building Council, by the second quarter of 2020, the total number of certified green buildings in Vietnam only stopped at 146 projects, with 3.2 million m², relatively low compared to the number of green buildings in Southeast Asian countries [2].

With many years of experience in green project development, Ecopark shows that there are four biggest challenges in Green Building implementation in Vietnam: 1) increasing investment costs; 2) the State has not had a specific support mechanism for real estate development under the green model; 3) there is a particular barrier to the creation of exterior architectural design; 4) the state regulations only have methods for assessing works (the September 2017 standard), there is no assessment method for green urban areas [3].

From the perspective of Green Building certifiers, difficulties in Green Building development in Vietnam include: 1) big developers are not ready; 2) design consultant, contractor has not paid due attention; 3) the additional cost of consulting and construction is not fully understood; 4) not yet drastic from the management agency [4].

Capital House said that Green Buildings' investment costs increase by 1 to 5 % depending on the type of building and EDGE or Lotus certification (Table 1) [5]. They believe that Green Building is suitable for all segments, especially the affordable segment,

Table 1. Increased investment costs in the green projects of Capital House [5]

No.	Project	Increased investment costs	Certificate
1	Ecolife Capitol	3 %	EDGE — home
2	EcoHome Phuc Loi	1...1.5 %	EDGE — home
3	EcoHome 3	1...1.5 %	EDGE — home
4	Ecolife Riverside	1...1.5 %	EDGE — home
5	EcoHome Nhon Binh	1...1.5 %	EDGE — home
6	Genesis School	5 %	LOTUS Non-Residential — GOLD
7	Capital House Office	5 %	LOTUS Interiors — Certified
8	Sales Center	5 %	LOTUS small Interiors — Certified

and needs to apply green solutions from the beginning and look at the whole project life cycle instead of look at the initial investment cost.

From the perspective of state management, experts of the Ministry of Construction stated that there are two reasons to promote Green Building development and efficient energy use: 1) Vietnam's demand for energy increases; 2) the development of construction science and technology. Accordingly, the tasks of factors to promote faster and more active Green Building development include: 1) government: international commitment to protect the environment, reduce emission and apply energy-efficient buildings and green buildings standards; 2) investors: competition in products and real estate rental price competition; 3) residents: higher requirements for living facilities, quality of housing and working environment [6].

Besides, the mobilization of investment capital for Green Building development is still tricky because credit institutions' mobilized capital is mainly short-term with commercial loan interest rates on the market. While investing in green fields (renewable energy, green buildings) has a long payback period, enormous investment costs, and many risks. Since then, banking experts propose to the Government the following solutions: 1) early issue guidelines on the list and criteria for identifying green projects suitable for Vietnam; 2) develop a comprehensive roadmap, policy mechanism (taxes, fees, capital, engineering, market, planning, development strategy) of each sector/field; 3) there is a mechanism to encourage all economic sectors (including credit institutions) to participate in Green Building development [7].

Compared with other countries in the world, investment costs for Green Buildings in Vietnam are higher [8].

Table 2. Cost of Green Buildings in Vietnam (Source: VGBC, 2017)

Other countries	Certification level	Vietnam
< 1 %	Certify	1.2... 2 %
0.8...2 %	Silver	1.2...2 %
1...3,5 %	Gold	1.8...5 %
2...10 %	Platinum	> 10 %

For various reasons, the number of Green Building certified projects in Vietnam compared to other countries in the region and worldwide is still relatively low [9].

When evaluating the efficiency that a Green Building brings, it is necessary to assess the efficiency in its entire life cycle. A Life Cycle Assessment (LCA) is the systematic analysis of products or services' potential environmental impacts during their whole life cycle [10].

The benefits, energy efficiency, environment, economics, and health that green buildings bring are evident and proven in Green Building certified projects.

3. MATERIALS AND METHODS

The policy of Green Building development is in line with the world trend of environmental protection, climate change response, and sustainable development, and the Vietnamese government has issued a system of legal documents, including:

- Law No. 55/2014/QH13 dated June 23, 2014, on environmental protection and Law on environmental protection (revised) 2020;
- Law No. 62/2020/QH14 dated June 17, 2020, on construction;
- Resolution No. 55-NQ/TW dated February 11, 2020, of the Politburo on "Vietnam's National Energy Development Strategy Orientation to 2030, Vision to 2045";
- Resolution No. 140/NQ-CP dated October 2, 2020, of the Government, promulgating the Government's Action Program to implement Resolution No. 55-NQ / TW dated February 11, 2020, of the Politburo on "direction of the National Energy Development Strategy of Vietnam to 2030, with a vision to 2045".

Table 3. Green Building certification systems in Vietnam [2]

Projects	EDGE	LEED	LOTUS	TOTAL
Number of certified projects	39	79	28	146
Gross Floor Area (GFA) of certified projects	1,995,439	878,002	331,161	3,206,603

In terms of local organizations, Vietnam Green Building Council (VGBC) is a member of the World Green Building Council Network launched LOTUS — the first local Green Building certification program for Vietnam in 2007 [11]. In particular, LOTUS certification has used some Vietnamese state standards instead of international standards.

Due to rising construction costs, many investors believe that green buildings are only for high-end housing when customers have

Table 4. Green Building Standards [2]

No.	LEED	LOTUS
1	ASHRAE 90.1 — Energy Standard for Buildings Except Low-Rise Residential Buildings	QCVN 09:2013 — National Technical Regulation on Energy Efficiency Buildings
2	ASHRAE 62.1 — Ventilation for Acceptable Indoor Air Quality	TCVN 5687:2010 — Ventilation-air conditioning Design standards
3	ASHRAE 55 — Thermal Comfort Conditions for Human Occupancy	TCXDVN 306:2004 — Dwelling and public buildings — Parametes for micro — Climates in the room
4	ASHRAE 189.1 — Standard for the Design of High-Performance Green Building	N/A

Table 5. The Ecohome three project gets the EDGE Green Certificate [5]

Project scale	Benefits	Increased investment costs
Location: Tu Liem, The west of Hanoi	Energy savings: 25 % (1.7 million MWh/year, 230,000 \$/year) Water savings: 36 % (98,500 m ³ /year, \$ 30,000/year)	Total investment increased 1...1.5 %, equivalent to \$ 830,000
Site area: 67,000 m ²		
Density of building: 30 %		
5 blocks, 31–35 floors		
3,744 apartments		
Area 39.9...76.7 m ²		
Price: 700 \$/m ²		
Procedure: Third quarter of 2020		

high affordability, but green housing development by many developers shows how more positive. Capital House recommends that Green buildings are very suitable for affordable housing with reasonable prices from implementing its green projects [5].

Through learning the experience of developing many green real estate projects, it is clearly seen that business efficiency is shown in many aspects as follows: 1) good price; 2) fast consumption time; 3) high brand value; 4) access to green finance. The survey at the HAUSNEO green housing project in District 9 Ho Chi Minh City (EDGE Certificate) also showed that the construction difference cost increased by 1 %, but the effect is enormous: fast sales, secondary market price increase by 25 % in 16 months.

At the Ecopark green project, after completing phase 1 (50 hectares), Ecopark starts phase 2 (West Bay Sky Residences), including



West Bay Sky Residences Apartment [12]

apartments of 45 m² or more, with \$ 30,000 to 40,000 depending on the area (Fig.). Strategic orientation for green development, Ecopark continues to develop new projects such as SkyOasis, Solforest, international schools. To create green buildings effectively, investors need to operate a 5-step process throughout the project life cycle, including Green planning — Green design — Green construction — Green operation — Green lifestyle.

Vietnam s real estate market overview shows that green housing has brought sound effects, buyers are excited about new products, and investors are optimistic about business performance. However, there are many difficulties and obstacles in developing green real estate projects, mainly due to increased investment costs, not positive customer sentiment, and lack of supportive policies and mechanisms from the state:

- increased investment costs reduce price competitiveness. Meanwhile, although operating costs decrease, most customers do not pay attention to this when buying an apartment, only looking from the initial purchase price's perspective, utility works to decide.
- the financial support mechanism is not specific yet for green real estate developers. There is no support for customers of energy-efficient housing projects.
- green sector/sector classification criteria are not specific, and there are no particular regulations on green buildings, current technical standards on energy-efficient buildings;
- propaganda is not effective. Most customers are not aware of the benefits of economical housing, so there is not much demand for housing. Green real estate investment and development companies have not yet linked practical needs with the need to use energy efficiently in buildings, so customers are less interested.

- capital mobilization of credit institutions is mainly short-term according to the market's cost of commercial capital. Green-field projects (renewable energy, green buildings) have long payback periods, enormous investment costs, and market risks.
- there is lack of large projects to implement. Most interested customers are in the high-end housing segment with limited numbers or customers who buy for speculation, and few people buy houses to live.

Research on international experience shows that governments play an important role in promoting green buildings, efficient use of energy, and sustainable development:

- the Thai government incentives floor area according to the degree certificate;
- Singapore is required to apply Green Building for construction permit;
- China obliges to apply Green Building for state budget projects in big cities;
- Malaysia refund for the cost increase due to Green Building;
- the US Green Building Council grants LEED certification for the first project in one country for free.

Analyzing Green Building implementation results in Vietnam leads to proposing solutions to remove difficulties and obstacles for Green Building development. The state, professional social organizations, and developers need to propagate and disseminate to customers to buy, rent, and rent and purchase houses about the importance of green housing and economic and effective energy use.

To stimulate demand for the housing market through specific projects and projects. Need to have a particular regulation on Energy Efficiency Buildings that meet the criteria and standards of national energy efficiency.

The state management agencies should issue Regulations and circulars to guide and manage Green Building certification activities in Vietnam, classify Green Building classes for financial incentives, and adequately recognize social responsibility.

It is necessary to have a broader propaganda form so that businesses and people are aware of the need for Green Building development. The expression of social responsibility is not a strong enough motivation to motivate companies to develop Green Buildings, so it is necessary to have more specific financial support mechanisms.

It is necessary to consider adjusting the design fees and adding the cost of consulting, evaluating, and certifying Green Buildings to the norm. The State should issue preferential policies (taxes, administrative procedures, construction density/floor area) for the Green Building construction actors.

The State should complete a legal system to guide, manage and evaluate a green development process from site selection, planning, design, construction, and operation, and issue guidelines and regulations for Green Building projects using public investment capital.

4. RESULTS

The potential for Green Building development in Vietnam and the world is enormous. Many international financial institutions and UN agencies are actively participating in policy support, make recommendations, and organizing training courses and seminars to raise awareness about sustainable Green Building development for Government, investors, consultants, and all people. Vietnam has used many international Green Certification standards.

The study has analyzed the current state of Green Building development in Vietnamese cities, the current state of the green certification system, the state management policy system, and international financial institutions' participation. Green real estate projects are deployed in different market segments, from low-end to high-end, and bring clear economic benefits to investors.

Real estate project implementation reveals difficulties and reasons for limited green building development, including increased investment costs, investor and user awareness, and saving solutions energy in design, construction, and materials and equipment used in Green Buildings.

The financial support and supporting mechanisms and policies from the authorities are not appropriate.

The study also proposes solutions to promote Green Building development for investors, consultants, residents, state management agencies, and credit institutions.

5. DISCUSSIONS, CONCLUSIONS

State management agencies role is vital for Green Building development, including policy-making, support and propaganda mechanisms, and public awareness. Green Building development should be carried out throughout the building's lifecycle, including 5 phases: Green planning — Green design — Green construction — Green operation — Green lifestyle.

It is essential to study the international system of Green Building certification standards. The state should also issue the Vietnamese standards for Green Building certification and the accompanying identification of technical standards.

The issuance of Green Building rating standards and Green Building certifications contributes significantly to environmentally friendly natural materials, efficient energy use, and overall sustainable development.

Initial results show that real estate developers and people are very interested in green housing products and a healthy living environment. This is an essential premise to continue developing green real estate projects in the future, especially in Vietnamese megacities.

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Состояние зеленого строительства и решения для его развития во Вьетнаме

Цены на жилье в мегаполисах Вьетнама довольно высокие из-за ограниченного количества земли. Кроме того, инвестиции в «зеленое» жилье требуют более высоких затрат на реализацию, чем инвестиции в обычные проекты, поскольку их удорожают расходы на сертификацию зеленого строительства, необходимую по международным стандартам. Несмотря на определенные трудности и проблемы, проекты «зеленой» недвижимости в долгосрочной перспективе приносят экономические выгоды как инвесторам, так и пользователям.

Развитие зеленого строительства — это тенденция, которая особенно интересует как государственные органы, так и частных девелоперов.

Анализируя текущее состояние развития зеленого строительства во Вьетнаме, авторы обнаружили препятствия, ограничения и предложили решения.

Для эффективного развития зеленого строительства инвесторам необходимо использовать пятиэтапный процесс на протяжении всего жизненного цикла проекта: «Зеленое планирование» — «Зеленый дизайн» — «Зеленое строительство» — «Зеленая эксплуатация» — «Зеленый образ жизни». Благодаря использованию экологически чистых материалов эффективность энергосбережения в зеленом жилье становится более доступной для городских жителей Вьетнама.

Ключевые слова: зеленое строительство, зеленое здание, недвижимость, зеленая недвижимость

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