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Portfolio Approach in Green Building Certification

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Portfolio Approach in Green Building Certification

Abstract. Hong Kong has over 9,000 high-rise buildings, of which over 1,500 are skyscrapers standing taller than 100m with 350 buildings over 150m. These buildings contribute to about 60% of the total carbon emissions of Hong Kong, therefore in Hong Kong's Climate Action Plan 2030+, existing building energy saving is one key focus where potential for energy saving is very significant. However, it is often difficult for existing building especially aged buildings to undergo green transformation due to the existing site constraint such as space and capital limitation and at the same time requiring continuous operation of the building. This paper presents a case study of a portfolio of high-rise buildings and comprehensive building development with buildings ranging from 60 to less than 5 years in operation, situated in the most densely populated commercial district in Hong Kong undergone a "Green Body Check", benchmarking using Hong Kong's Green Building accreditation - BEAM Plus for Existing Building and identified appropriate green measures to improve its performance. The aim of the developer is not only trying to reduce the carbon emission of its portfolio, but to lead by example and showcasing the impact to the portfolio but also to the tenants and beyond. This study aims to highlight the importance of continuous monitoring and benchmarking, adopting green building accreditation as a framework in evaluating the existing performance and effectively identify improvement measures. Lastly to appreciate major players in the building industry to lead and drive the industry greener and more sustainable in order to tackle the global climate change crisis.

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1. Introduction

Similar to many densely populated cities in the world, Hong Kong has over 9,000 high-rise buildings, of which over 1,500 are skyscrapers standing taller than 100m with 350 buildings over 150m. These buildings contribute to about 60% of the total carbon emissions of Hong Kong. With a global challenge in tackling the climate change crisis, the Hong Kong Government has created a Hong Kong's Climate Action Plan 2030+, establishing road map in reducing the city's carbon intensity, setting long and short-term carbon intensity reduction targets.

It is understood that one of the key focus on energy saving is existing building where potential for energy saving is very significant. However, it is often difficult for existing building especially aged buildings to undergo green transformation due to the existing site constraint such as space and capital limitation and at the same time requiring continuous operation of the building. On the other hand, the benefits of energy measures are often intangible and long in paybacks. With all these obstacles, greening an existing building with the hopes of reducing the environmental burden of the building would require additional motivating factors in order to further foster this movement.

This paper presents a case study of a portfolio of high-rise buildings and comprehensive building development with buildings ranging from 60 to less than 5 years in operation, situated in the most densely populated commercial district in Hong Kong undergone a "Green Body Check", benchmarking

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using Hong Kong's Green Building accreditation - BEAM Plus for Existing Building and identified appropriate green measures to improve its performance. Highlighting several benefits and difficulties in adopting Green Building Accreditations especially in relation to a portfolio of buildings and also identify any new incentive or changes of framework that could further motivate developers, property or fund managers to carry out similar actions.

2. Climate Action 2030+

In terms of energy or carbon reduction, Hong Kong Government has set an ambitious carbon intensity target of 65% to 70% by 2030 using 2005 as the base, which is equivalent to 26% to 36% absolute reduction and a reduction to 3.3-3.8 tonnes on a per capita basis. To achieve this ambitious target, a range of mitigation measures are being planned in different aspect of energy use in Hong Kong.

2.1. Supply Side

About 70% of Hong Kong's carbon emissions come from electricity generation, currently dominated by coal-fire and natural gas-fired electricity generations. To reduce the carbon emission of energy generation, natural gas will generate about half of Hong Kong electricity by 2020 while coal will drop to about 25%. However, to meet the new carbon intensity reduction target of 65-70% by 2030, coal-fired electricity generation will be phased down and replace them with natural gas and other non-fossil fuel sources as illustrated in Figure 1.

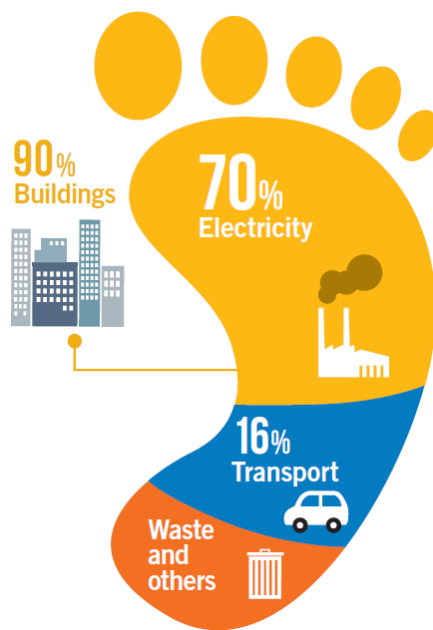


Figure 1. Hong Kong Carbon Emission Footprint

Other than switching from coal to gas-fired electricity generations, the government also intending to increase the non-fossil fuel generation portion by creating conditions to facilitate the private sector adopting renewable energy such as establishing feed-in tariff and renewable certificate system. For instance, the Water Supplies Department has started to explore the potential for electricity generation from floating PV systems on reservoirs by installing two small systems in two reservoirs in Hong Kong as a trial run. Lastly, it is committed to expand the long-term waste to energy generation such as the already in use sludge treatment facilitate, organic waste treatment facilities which is expected to be in full operation by 2021 and a large scale waste to energy plant to treat general MSW is expected to be in operation by 2024. By 2024, the abovementioned plants are expected to provide about 1% of Hong Kong's total electricity needs.

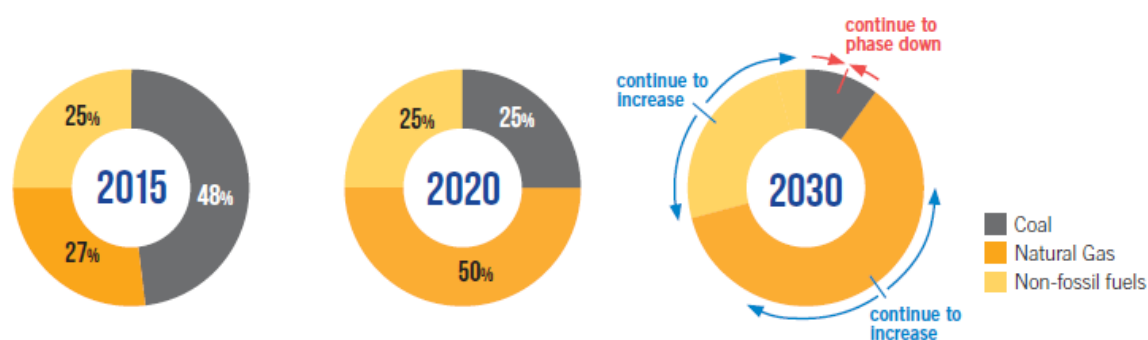






Figure 2. Reduction of Coal in Fuel Mix for Electricity Generation 2015-2030²

2.2. Demand Side

As the major source of carbon emission in Hong Kong is building sectors which account for about 90% of the city's electricity usage where over 60% of our carbon emissions are attributable to generating electricity for our buildings. While new buildings shall be governed by relevant Building Energy Code, existing building is a key focus going forward since they represent the majority of buildings where potential for energy saving is very significant. The government has reviewed the existing strategies and seek ways to improve going forward by 2030 in order to achieve the long-term carbon reduction goals as shown in Figure 2.

Other than driving the improvement on existing buildings, Government infrastructure uses about 46% of all the electricity that the Government consumes, in which Waste Supplies Department and Drainage Supplies Department use the largest portion of electricity among government infrastructure (almost 75%) and therefore the departments have ongoing plan to improve its existing facilities by replacing or renovating aged facilities with highly energy efficient systems.

Strategies	Existing Policies	Going Forward by 2030
Energy Audit 	Energy Audit Code (EAC) requires audit every 10 years for 4 types of building services installation of prescribed buildings	Require more frequent audit for air conditioning system for major energy use buildings
Benchmarking 	Building Energy Efficiency Ordinance requires disclosure of Energy Utilization Index (EUI)	Voluntary sharing of data moving to mandatory system
Retro-commissioning 	No requirement and not a common practice yet	Promote good practice in public sector buildings and co-learn with private sector and professionals
Retrofitting 	EAC audit provides recommendations but no requirement to carry them out	Promote recommendations to be carried out

² Hong Kong's Climate Action Plan 2030+

<https://www.enb.gov.hk/sites/default/files/pdf/ClimateActionPlanEng.pdf>



Green Building Standard 	A new BEAM Plus rating with the option of selective assessment in addition to compressive assessment has been developed for existing buildings	Encourage building owners to consider using the new rating when retro-fitting buildings
Beyond compliance 	Created “Dialogue Platform” for public-private sector collaborating	Continue to energise energy saving in existing building

Table 1. Existing and Possible Policies in Energy Improvement in Existing Building³

3. Other Drivers – Environmental, Social & Governance Requirement

Apart from the Hong Kong Government setting up frameworks and carrying out actions to drive the green movement in Hong Kong, there are other major parties that area also encouraging property developers and other major corporates to act in tackling the climate change crisis.

Principles in Responsible Investment (PRI)⁴ is a world’s leading proponent of responsible investment. PRI defines responsible investment as a strategy and practice to incorporate environmental, social and governance (ESG) factors in investment decisions and active ownership. This group of investors are demanding corporates to disclosure ESG related information While most of the investors believe that considering ESG factors can improve their image and reputation, some investors take such approach as a way to avoid investment risks, manage the volatility, and even achieving long-term investment return. This results in driving a positive and competitive market in ESG performance within the corporate entities. On the other hand, increasing number of stock exchanges in the world are enforcing mandatory ESG disclosures to listed companies and publishing their own Sustainability Indexes such as the Hang Seng Corporate Sustainability Index Series in Hong Kong which further strengthen the demand in improving individual corporates’ ESG performance.

In respect to the property industry which accounts for large portion of energy consumptions, their ESG performance is utmost important in the global green movement. Global Real Estate Sustainability Benchmark (GRESB)⁵ is an independent ESG benchmarking system specific for the real estate industry, providing comparable and reliable data on the ESG performance of their investments to large pension funds who want to have access to this kind of information. Within the GRESB Assessment, Green Building Certification pays a significant role in guiding the fund or portfolio in achieving high ESG performance.

4. Case Study - Hongkong Land Central Portfolio

To assess the ESG performance of an existing building, in a facilities management point of view, Green Building Certification schemes such as Hong Kong’s BEAM Plus for Existing Building provides a appropriate benchmarking mechanism. Similar to carrying out a body check for human, following a Green Building Certification scheme act as a “Green Body Check” for a building to maintain the “healthiness” of a building and also identify any major deficiencies and opportunities for improvement in a broad ESG perspective.

Hongkong Land is a major listed property investment, management and development group, the Group owns and manages more than 850,000 sq. m. of prime office and luxury retail property in key Asian cities, principally in Hong Kong, Singapore, Beijing and Jakarta. In which the Group's Central Hong Kong portfolio represents some 450,000 sq. m. of prime property. Figure 3 and Table 2 below

³ Hong Kong’s Climate Action Plan 2030+

<https://www.enb.gov.hk/sites/default/files/pdf/ClimateActionPlanEng.pdf>

⁴ <https://www.unpri.org/>

⁵ <https://gresb.com/>

shows the list of properties under direct management by Hongkong Land in its Central Hong Kong Portfolio.

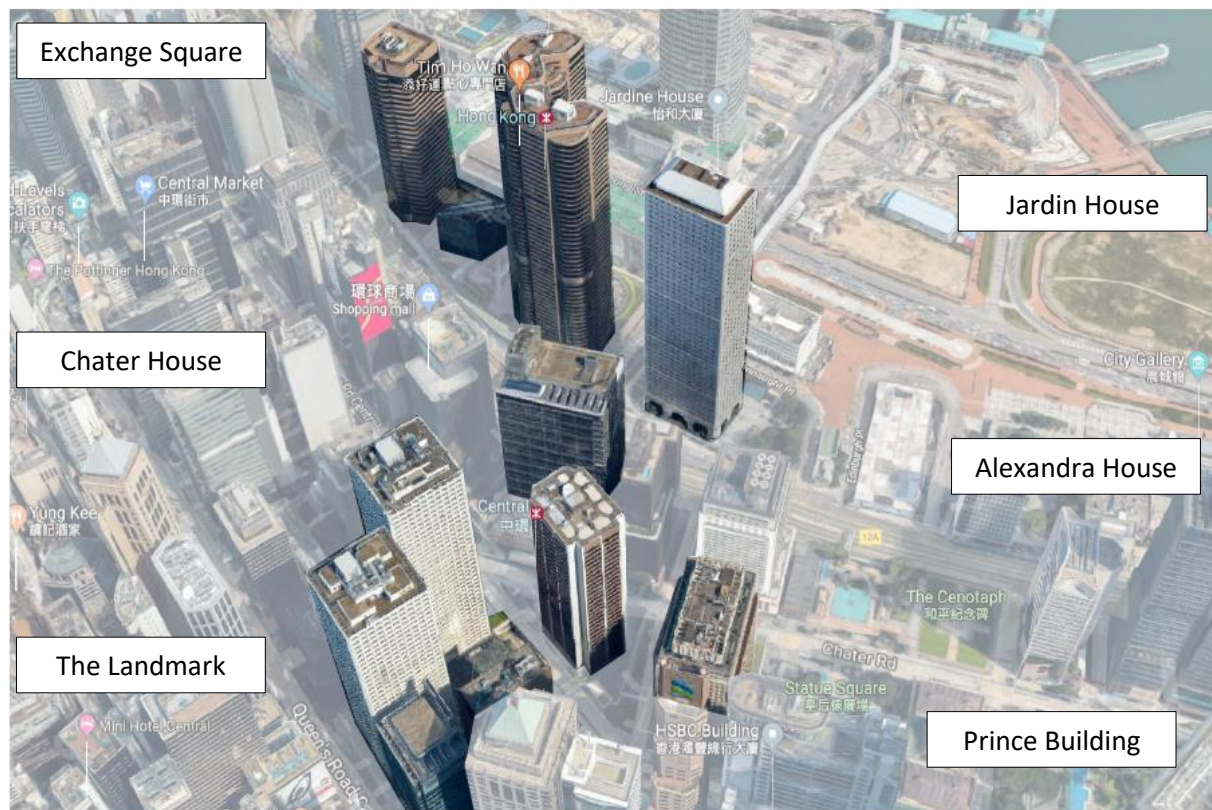


Figure 3. Illustration of Hongkong Land Central Portfolio

Property	Type	Established in	Gross Floor Area (m ²)
Exchange Square	Office / Retail	1988	~200,000
Charter House	Office / Retail	2003	~55,000
The Landmark	Office / Retail	1983	~160,000
Jardine House	Office / Retail	1973	~89,000
Alexandra House	Office / Retail	1976	~47,000
Prince Building	Office / Retail	1965	~54,000

Table 2. Parameters of Hongkong Land Central Portfolio

4.1. Green Body Check – Portfolio Approach

Similar to many green building schemes in the world, BEAM Plus for Existing Building Scheme focuses on a variety of aspects in relation to the context of the operation, maintenance and management of an existing building.

Management

Objectives, policies and procedures were reviewed to ensure a sustainable operation manner. It included management for green procurement, ISO 140001 & 50001, proper operation and maintenance, indoor air quality management and pest management and etc.

Site Aspect

The selection of site location and architectural design of the building could enhance the sustainable built environment by active and passive design. It embraced continuous maintenance of the building service

& envelop design, light pollution control, reduction of heat island effect, and amenities features for O&M and building users and etc.

Material Use

Proper material purchase and disposal could reduce environmental pollutions via manufacturing and disposal process. It included material purchasing plan, avoidance the use of ozone depleting substance, waste and food waste management, recycling facilities and establishment of waste reduction target and etc.

Energy Use

The energy consumption by the building services system are assessed by comparing with the benchmarks derived from audits of similar building type. It included energy management, and analysis, regular commissioning, comparison of benchmark and future improvement and etc.

Water Use

The quality and quantity of the water use were assessed through management and audit. It included water conservation plan, provision of water efficiency devices, water quality survey, reuse of process water, regular plumbing and drainage inspection, water metering and audit and provision of twin tank system for fresh and flushing water and etc.

Indoor Environmental Quality

The indoor environment qualities were checked which might impact on the human health and comfort, as well as improvement of quality and functionality. It included ventilation, thermal comfort, hygiene, indoor air quality, control of environmental tobacco smoking, room acoustic and background noise and etc.

Innovation

Innovative ideas and designs were discussed and determine the feasibility of new innovations in order to achieve more ambitious targets and exemplary performances.

These categories are assessed individually and the achieved credits are summarized into a final rating which represents an overall rating or performance of the assessing building in terms of its ESG performance. Since this case study involves Hongkong Land's Central portfolio consist of six development complexes with 12 buildings all together under the same management, a portfolio approach or volume certification was adopted for this certification project. The assessing credits were separated in two different types of credits: central policies and plans that covers all buildings and individual implementation records, reports and calculations were assessed separately. During the green building assessment, a range of challenges and opportunities were faced and found.

4.2. Major Challenges

The lack flexibility of certain green building scheme may be problematic for buildings, especially when the buildings under assessment are aged from 17 – 47 years, original documents such as architectural or engineering drawings, systems testing and commissioning records are often not available, also the operating patterns changes over time and the operating conditions changes with it. On the other hand, the physical spaces are not planned out as per the prevailing regulations, but the green building certification scheme adopting prevailing common practice may not be applicable to the aged buildings. Therefore, difficult to carry out improvements in occasions such as universal access provision may not be comprehensive to cover the whole building.

In terms of building services systems, new technologies such as automatic control system may not be applicable for upgrades on the existing installation, sometimes it is often economically reasonable to replace the systems at the end of their life span rather than earlier.

In certification perspective, most green building schemes requires extensive workload in preparing documentation for the submissions. Additional burden on the existing facility management

team would often demotivate the team's effort. Prescriptive methods in demonstrating compliances to individual requirements or streamlining the documentation requirement may help in reducing the overall work load of carrying out the certifications.

4.3. Opportunities

Despite the challenges faced, many good features were identified and appreciated by the scheme such as the standardized quality, environmental and safety management framework has been implemented throughout the portfolio, resource management such as energy, water and waste were reviewed holistically for setting and accomplishing the short-term and long-term portfolio saving target.

On the other hand, further opportunities in enhancing the management's performance were also identified, some individual management plan or site management memo were subsequently centralized and operational staff were trained together to have consistency among the portfolio. In energy perspective, the importance of power quality monitoring was highlighted and a portfolio wide energy and power quality monitoring management system were upgraded. Unregulated water usages were identified during water audit, operations required extensive usages of portable water were studied and implemented ways to improved its water usage performance.

Waste recovery and recycling opportunity were also recognised during the waste audit, a detailed study was conducted to enhance the waste recycling bins network within the portfolio. Evaluating the effectiveness of current waste bins locations, identify any uncovered or excessive area for addition or deduction of waste recycling bins. This had helped improving the waste recovery rate and the sorting efficiency of the portfolio but also within the Central district of Hong Kong.

4.4. Other Economic, Environmental and Social Benefits

During the process of the assessment, a range of energy and water measures were evaluated to seek the opportunities for further improvement. This process has increased the demand of new effective and commercially viable property technology to develop in order to support the property management in achieving outstanding environmental performance, further driving the green economy.

Other than the above, it is also understood that a collaborative effort with the tenants, continuous advocating the environmental and social messages across the community is essential and effective. Stakeholder engagement sharing green practices such as energy and water saving strategies, BYOB culture and recycling practices and also to learn from the relevant stakeholder in ways to further enable their green actions and behaviours in achieving a low carbon living throughout.

5. Barriers and Recommendations

Adopting Green Building Certification scheme can bring about much opportunities in enhancing the ESG performance of the building or portfolio. Having adopting a portfolio approach further helps fund managers or portfolio management to streamline and compact the certification process in a more efficient and economic way, also help synergizing corporate sustainability policies and plans across the portfolio.

However, the workload from adopting the scheme is often too high and the return in investment is often not tangible. It is important for government to monetarize the incentive or give direct support in apply green building scheme or implementing green measures to improve the project's ESG performance.

Mandatory vs Voluntary

Currently, adopting green building scheme for existing building is voluntarily in Hong Kong, however if the government is to mandate it similar to energy audit code where prescribed buildings are to carried out every 10 years, resulting in a large scale "Green Body Check" or "Green Sweep" shall be carried out for Hong Kong, identify major improvement opportunities individually. Also, a standardised benchmarking system would be enforced to consistently compare the ESG performance of the existing buildings, further analysis can be carried out based on the database where more effective measures and policies can be implemented in the future ahead.

Reward vs Punishment

Based on the database, more incentive such as funding of green projects, rewarding schemes for carbon reduction retrofitting works can be introduced to encourage the adaptation of the scheme. On the contrary, if a polluter-paid principal is enforced, possibly a more rapid response in the market maybe anticipated in order to avoid any substantial fine from occurring. In result may further drives the economy simulating the green market in creating and adopting green measures to achieve specific goals and targets.

6. Conclusion

In attempting to ameliorate the global climate change crisis, an emerging trend and global movement in ESG performance enhancement especially in the building sector has been developed. Public disclosures of ESG data shall be an industrial norm in the near future to facilitate investors to incorporate environmental, social and governance (ESG) factors in investment decision making. Tools such as Green Building Certification Schemes appreciate a lot of great sustainability activities of a building and scaling up the building certification to a volume or portfolio approach can bring about additional benefits and enhances its efficiencies and economic of scale. However, without long term support from the government will only put additional burden on the fund managers or properties developers.

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