

Insights

GREEN RETROFITS – CONSIDERATIONS FOR “GREENING” AN ASSET

ENERGY EFFICIENCY SERIES – PART 4

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INTRODUCTION

In our preceding articles for the Energy Efficiency series, our team examined the opportunities and risks in the context of greening existing real estate. This was linked to:

1. The broader backdrop of the Paris Climate Agreement, in terms of reducing greenhouse gas emissions by 45 percent by 2030 and achieving carbon neutrality by 2050;
2. Further to those goals, the increased focus and scrutiny on ESG risks by governments and corporations;
3. Potentially leading to developments in the real estate sector relating to, among others:
 - (a) Certification standards – currency and future-proofing;
 - (b) Green premiums – an increased demand for green buildings driven by both occupiers and investors;
 - (c) Energy generation – renewable sources, on-site generation and energy efficiency services providers;
 - (d) Financing and funding to aid the green transition.

For this article, we will discuss the “physical greening” of the assets and what that means in the context of construction and renovation. Using the Singapore Green Plan 2030 as a lens to cover this topic and also touching slightly on the wider ASEAN region, we will first consider the targets and steps suggested and taken there, before considering – with broader application – the methodologies and materiality around the greening of buildings and what this means for asset managers.

SINGAPORE – THROUGH THE LOOKING GLASS

With the Paris Climate Agreement and UN Development Goals 2030 as a backdrop and a driver, various countries and regions have set out their own roadmap around the energy transition for existing real estate.

In Singapore, the Singapore Green Plan 2030 was launched in February 2021^[1], which sought to galvanize a whole-of-nation movement and advance Singapore's national agenda on sustainable development. As part of the plan, greening buildings is a key strategy to achieve those sustainability ambitions.

It is interesting to note that Singapore's first Green Building Masterplan was launched in 2006 to encourage developments to embed sustainability as part of a building's life cycle *from the onset*. As the built environment sector began to embrace the idea of sustainable buildings, the Building and Construction Authority (BCA) also took into account the greening of the larger stock of existing buildings and embedded those targets into subsequent plans^[2].

The 2030 targets are (a) to green 80% of Singapore's buildings (by GFA), (b) have 80% of new developments (by GFA) to be Super Low Energy buildings and (c) achieve 80% improvement in energy efficiency for best-in-class green buildings.

In order to achieve (a) and (c) above, BCA have set out these steps:

- **Transparency and benchmarking** - in the building energy performance data that it publishes (starting with commercial buildings), BCA will identify the buildings along with their energy-related information. This information will be accessible to the public. Owners of existing buildings will be able to benchmark their energy performance against similar building types and take steps to improve energy performance.
- **Future-proofing** – BCA will raise the mandatory environmental sustainability standards for existing buildings undergoing major retrofit. This includes raising minimum energy performance requirements and introducing mandatory sustainable construction practices to lower the carbon footprint for the buildings.
- **Updating certifications** – BCA will update the Green Mark scheme to raise energy performance standards and place greater emphasis on other important sustainability outcomes such as designing for maintainability, reducing embodied carbon across a building's life cycle and creating healthier environments.
- **Cash incentives** – to raise the energy performance of existing buildings, BCA launched an enhanced SGD63million cash incentive scheme, to help building owners lower the upfront capital cost of energy efficiency retrofits which achieve the higher energy performance standards.

- **Promoting innovation** – established in 2014, the Green Buildings Innovation Cluster (GBIC) program^[3] supports the development and demonstration of innovative energy efficient technologies and solutions with a high potential for adoption. To push the boundaries of energy efficiency in buildings, BCA provided enhanced funding of SGD45million for the program, covering research areas such as alternative cooling technologies, data driven smart building solutions and next generation building ventilation^[4].

ASEAN – A WIDER ROADMAP

In the Roadmap for Energy-Efficient Buildings and Construction in ASEAN published by the International Energy Agency (“**ASEAN Roadmap**”), the following seven areas were identified as key areas for focus to support the transition to net zero carbon buildings and construction^[5]:

- Urban planning
- New buildings
- Existing buildings
- Materials
- Systems and operations
- Sustainable energy
- Resilience

For existing buildings, there is currently a lack of data regarding the quality and performance of existing stock and therefore also the most effective retrofit measures to employ. Moving forward, the ASEAN Roadmap’s vision for existing buildings is that they are retrofitted to achieve high levels of energy performance and lower levels of embodied carbon to reduce fuel costs and improve thermal comfort. In this context, they identified four key actions and eleven activities (under each action) in the form of:

- Promoting the uptake of high-performance fabric systems by promoting utilization of:
 - High performance insulate and emissive fabric materials
 - Solar and thermal control glazing
 - Solar shading
- Boost the rate of energy efficiency retrofits by:
 - Incentivizing retrofit market activity

- Increasing availability of energy-efficient retrofit professionals
- Increasing awareness of building energy performance
- Boost the quality of energy efficiency retrofits by:
 - Developing quality standards for building retrofits
 - Improving consumer confidence through quality standards
- Promote the adoption of building energy performance standards by:
 - Enacting energy performance standards for existing buildings
 - Promoting energy performance certification programs
 - Adopting building energy labelling

In the ASEAN Roadmap, Singapore, Indonesia, Philippines and Thailand have been identified as having the following in place – energy benchmark policies, audits and energy renovation policies and the relevant minimum energy performance standards (“MEPS”). While most of the other ASEAN countries have regulations and policies relating to the latter two, they may not have developed benchmarking and building ratings.

TRACKING THE ROADMAP

Based on the above, we do see some common trends around what is key in enhancing energy efficiency for existing buildings and what an asset owner - regardless of geography - should look out for. We address each of them in turn below.

REGULATIONS, CERTIFICATIONS AND STANDARDS

These should be cohesively set such that developers, asset managers, contractors and stakeholders are clear as to what requirements need to be complied with. In Singapore, these are laid out in the Building Control Act and Regulations, BCA Green Mark Schemes, Singapore Standards relating to environment and sustainability for buildings, among others. In addition, there is the collection and benchmarking of data across different buildings, promoting transparency and accountability in the asset managers’ portfolios and in a sense, (hopefully) promoting competition in applying green methodologies for the purposes of, for example, attracting green premiums and financing.

Apart from local certifications, there are also internationally recognized certification systems in many mature real estate markets such as Leadership in Energy and Environmental Design (LEED),

Building Research Establishment Global Environmental Assessment Method (BREEAM) and WELL Building Standards.

While asset managers may be familiar with the currency of regulations and certifications, it may also be prudent to consider future proofing and not just complying with the minimum standards that are currently in place. In [Part 1 of this series](#), we discussed the UK government's plan to put further pressure on real estate owners with additional Energy Performance Certificate ("EPC") ratings between now and 2030. Without the requisite minimum EPC rating, it will be unlawful for commercial property owners to let their property out and owners face potential fines of £150,000.

Considering the constant development in technology, systems and materials, owners should keep abreast of these advancements and think ahead, when doing retrofitting, how and to what extent they intend to "green" the building, with the engagement of experienced and accredited consultants. Alternatively, in terms of acquiring buildings and portfolios, it would make sense to do so with a view to properties that already have the highest possible certification – leaving a smaller gap for potential upgrades.

In terms of regulations, it would also be interesting to see any requirements and incentives around repurposing existing assets to extend the life cycle of a building. While this will be subject to planning and zoning requirements, it is imperative to think about existing stock creatively (e.g. encouraging mixed use, limiting building vacancy)^[6] with a view to refurbishment and improving the efficiencies of the building.

If the life of the building cannot be extended, it would be helpful to consider the reduction of construction and demolition waste by the recycling and reuse of materials in the next project, whether it is a new build or existing project. The relevant codes of practice^[7] provide that it is vital that the waste is properly managed and sorted on site for channeling to appropriate recycling facilities for further processing into usable products, which includes recycled concrete aggregate, metals and compressed wood, and additional guidelines on how best utilize the construction and demolition waste. This would likely go toward helping the owner achieve certain green certifications as part of the usage of sustainable materials and practices.

MATERIALS, CONSTRUCTION METHODOLOGIES AND SYSTEMS EFFICIENCIES

In the last paragraph, we mentioned using recycled materials in building projects, which helps to reduce the embodied carbon of the building. Embodied carbon is defined as the sum impact of all carbon emissions attributed to the materials throughout their life cycle. This includes the extraction, manufacturing and transportation of building materials to its ultimate incorporation in the construction of the building and finally demolition and disposal.

While there is a limit to the amount of overhaul one could do in relation to an existing building, there is still the possibility to renovate the building envelope (walls, roof and windows) and service

systems (cooling, heating and ventilation) as the first action to improve the energy performance of existing buildings and to bring them to the standards of new buildings^[8]. In our previous article, we had similarly alluded to installing LED lighting, optimization of building management systems and insulation to improve building thermodynamics, among others.

In this context, reducing the embodied carbon to the extent possible by switching away from components such as iron, steel, cement and concrete and turning our attention to recycled, low(er) carbon and bio-based materials will be instrumental to decarbonizing construction, going hand in hand with greening the asset.

With the availability of Design for Manufacturing Assembly (DfMA) and Building Information Modelling (BIM), there is also the possibility of lowering the demand for construction materials and increasing productivity through design and collaboration with different stakeholders. BIM can also help to the owner to achieve energy savings during the operation of the building, by monitoring and managing energy usage and assisting with performance management, therefore reducing operational carbon.

Last but not least, other suggested steps in the ASEAN Roadmap to advance energy efficiency in the operation of buildings and systems include^[9]:

- Expanding incentives and increasing availability of efficient systems and appliances, including expanding the using the services of energy services companies (ESCO);
- Increasing adoption of building and energy management systems, energy audits, maintenance tools and recommissioning of existing systems;
- Establishing and developing frameworks around:
 - Disclosure of energy performance,
 - Increasing the use of rating tools and benchmarking, and
 - Developing data protocols for the collection and reporting of building characteristics and requirements as well as building passports with digital passport data storage and sharing.

STAKEHOLDERS AND CONTRACTING

As part of Singapore's Green Mark 2021^[10], BCA published a green lease toolkit. This toolkit was created to aid building owners / landlords and tenants in improving the environmental performance over the life of the building which they manage or occupy and provided a list of standard clauses, containing specific provisions for sustainable design and management by monitoring and improving energy efficiency as well as water efficiency and sustainable materials. There are suggested minimum as well as enhanced standards and benchmarks for both the landlord and

tenant. Certainly, the concept and usage of green leases is not new but they have however seen greater adoption in recent years.

In the context of fit-out and renovation contracts, the “green” requirements (such as the specifications in the Green Mark Scheme) would typically be set out in the technical or performance specifications for the contractor to execute. The clauses would likely provide that the works, equipment and/or appliances supplied are up to the relevant energy efficiency standards.

To help owners and energy performance contracting (EPC) firms achieve a more seamless energy efficiency arrangement, the Singapore Green Building Council has also developed a template for energy performance contracting for buildings. In this connection, asset owners, managing agents and EPC firms will have a point of reference when procuring energy efficient retrofit or renewable energy installation works^[11].

While not under the purview of this article, it bears noting that for larger construction and infrastructure projects, the New Engineering Contract (NEC) form of contract now includes optional X29 clauses, which are climate type change clauses to help the industry achieve net zero emissions and sustainability targets in the creation and operation of built assets. These clauses have been prepared for different types of construction and professional services contracts, and are more specific in the preparation of a climate change execution plan, measure of performance targets, as well as incentives and adjustments to contract sums if the targets are improved upon / not met.

Depending on the construction required for an existing asset, there could be takeaways from the NEC suite of contracts in order to incentivize a contractor to adopt sustainable construction practices, etc.

CONCLUSION

In the race to net zero, there are many different facets to consider – compliance with regulations, achieving certifications, appointing the right teams, commercial and technological realities and future proofing. As we put one foot in front of the other, it is key to take a holistic view of what we can implement as part of sustainable practices and to generate sustainable outcomes.

Complying with the applicable local and international certifications are a start, but different stakeholders would also do well to collaborate and plan ahead in relation to building life cycles, supply chains and construction materials and methodologies, in a bid to reach the goal of green – and not just greening – real estate.

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- [1] <https://www.greenplan.gov.sg/overview>
- [2] <https://www1.bca.gov.sg/buildsg/sustainability/green-building-masterplans>
- [3] <https://www1.bca.gov.sg/buildsg/buildsg-transformation-fund/green-buildings-innovation-cluster-gbic-programme>
- [4] A list of projects funded by the GBIC program can be found here:
<https://www.sleb.sg/ProjectMaps>
- [5] <https://iea.blob.core.windows.net/assets/5255ea58-1fa7-4fb4-bca0-b32923e9184a/RoadmapforEnergy-EfficientBuildingsandConstructioninASEAN.pdf>
- [6] Resource Efficiency and Climate Change, Material Efficiency Strategies for a Low Carbon Future, UN Environment Program 2020
- [7] https://www1.bca.gov.sg/docs/default-source/docs-corp-buildsg/sustainability/sc_recycle_final.pdf
- [8] <https://iea.blob.core.windows.net/assets/5255ea58-1fa7-4fb4-bca0-b32923e9184a/RoadmapforEnergy-EfficientBuildingsandConstructioninASEAN.pdf>, page 77.
- [9] <https://iea.blob.core.windows.net/assets/5255ea58-1fa7-4fb4-bca0-b32923e9184a/RoadmapforEnergy-EfficientBuildingsandConstructioninASEAN.pdf>, page 113
- [10] <https://www1.bca.gov.sg/buildsg/sustainability/green-mark-certification-scheme/green-mark-2021>
- [11] <https://www.sgbc.sg/sgbc-certifications/>

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MEET THE TEAM



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