

CARBON NEUTRALITY STRATEGIC FRAMEWORK

SEPTEMBER 2024

BACKGROUND

The Architectural Services Department is committed to addressing environmental challenges and providing practicable solutions. Decarbonisation is one of our commitments to contribute to low carbon transformation in our built environment.

Aligned with The Hong Kong Climate Action Plan 2050, and its “Energy Saving and Green Buildings” strategy, we have formulated our “Carbon Neutrality Strategic Framework” to speed up carbon neutrality through the adoption of the 3A strategy.



“3A” STRATEGY



https://www.archsd.gov.hk/media/Tech_Video/3AVideo.mp4

ACCELERATE

To explore, develop and adopt smart and advanced technologies to accelerate low-carbon transformation in our projects.

Practical Strategies under “Accelerate”



Internet of Things (IoT) and Smart Control



Building Information Modelling (BIM)

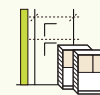


Recycled, Low Carbon and Innovative Materials

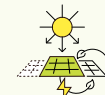
AMPLIFY

To adopt performance-based approach to go beyond and above statutory requirements and apply green and high productivity construction technologies to maximise decarbonisation performance in projects.

Practical Strategies under “Amplify”



Prefabrication and High Productivity Construction Method



More Onsite Renewables

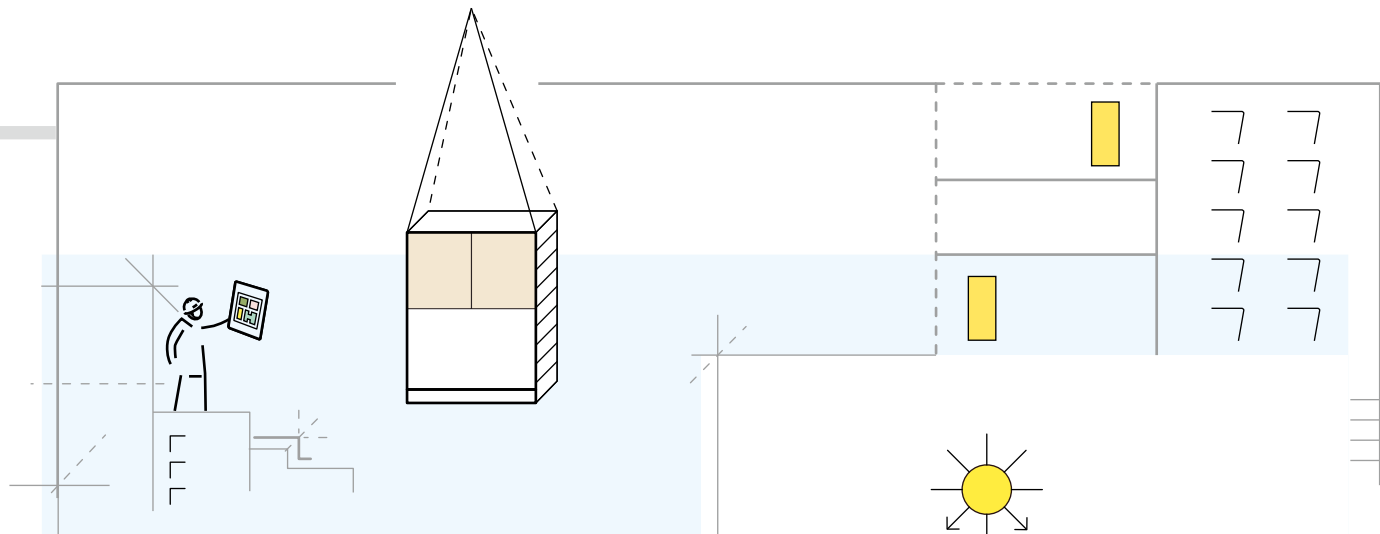
ACT TOGETHER

To work hand-in-hand with stakeholders to combat future climate challenges and build the carbon neutral future together.

AMPLIFY

“Amplify” represents the strategy of advancing the green building initiative through the wider adoption of a performance-based design approach such as incorporating wind, daylight and solar analysis. We evaluate a variety of design options to maximise energy-saving potential while minimising the adverse environmental impacts of construction activities.

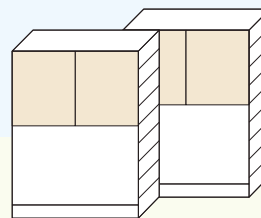
By embracing innovative construction methods and incorporating renewable energy features, we strive to go beyond the minimum requirements of prevailing statutory enactments and current green building standards to enhance productivity and boost decarbonisation performances.



Practical Strategies under “Amplify”

Prefabrication and High Productivity Construction Method

Prefabrication and Modular Integrated Construction (MiC) is a construction method where freestanding volumetric modules, complete with finishes, fixtures, and fittings, are manufactured off-site and then transported to the construction site for assembly. Proven benefits include improved site safety, more efficient and better quality control, shortened construction periods, reduced construction waste, decreased demand for on-site labour, and less disturbance and nuisance to the neighbourhood. These advantages contribute to a higher quality and more sustainable built-environment.



More Onsite Renewables

Renewable energy installations harness natural resources, such as sunlight to generate electricity. This reduces the building’s reliance on energy generated by power plants and, in turn, lowers carbon emissions. Different renewable energy systems, including Photovoltaic Thermal Collectors, Bifacial Photovoltaic Panels, Flexible Photovoltaic Panels, and Walkable Photovoltaic Floor are suitable for installation depending on the building types and functions.



ACCELERATE

“Accelerate” represents the utilisation of green, innovative and smart technology to expedite the pace of decarbonisation. Adoption of breakthrough technologies, together with engineering analysis, advanced design tools, recycled materials, low-carbon solutions, and innovative materials allow optimisation of energy efficiency, reduce carbon emissions, and enhance sustainability performance in our projects and services.

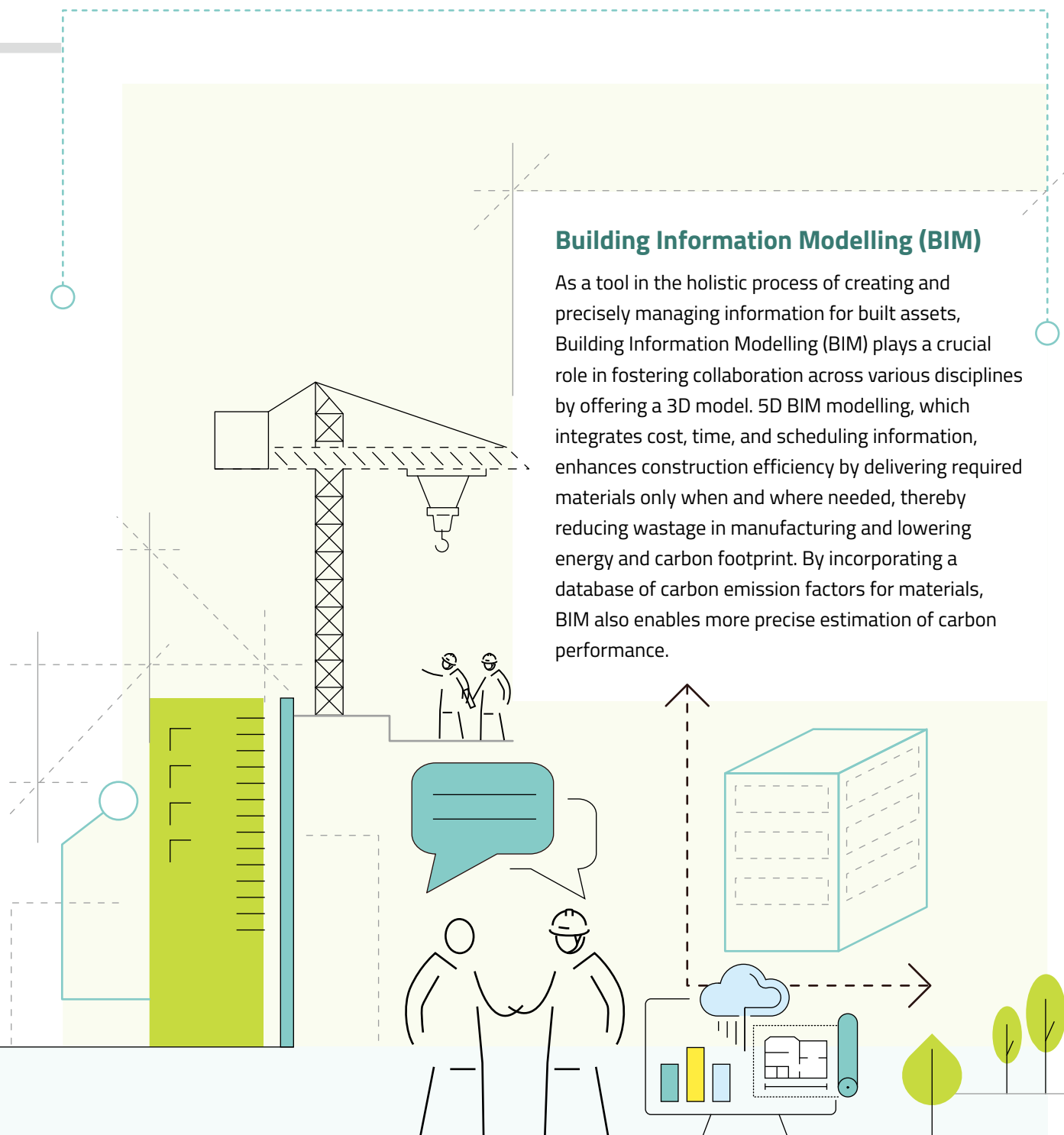
Practical Strategies under “Accelerate”:

Internet of Things (IoT) and Smart Control

Internet of Things (IoT) and smart control systems enable continuous monitoring and real-time intelligent management of building systems. By integrating machine learning capabilities into Building Energy Management Systems (BEMS), IoT and smart control systems facilitate the implementation of energy-efficient strategies within buildings, enhancing the capacity to centralise and automate diverse services, resulting in heightened levels of energy efficiency.

Building Information Modelling (BIM)

As a tool in the holistic process of creating and precisely managing information for built assets, Building Information Modelling (BIM) plays a crucial role in fostering collaboration across various disciplines by offering a 3D model. 5D BIM modelling, which integrates cost, time, and scheduling information, enhances construction efficiency by delivering required materials only when and where needed, thereby reducing wastage in manufacturing and lowering energy and carbon footprint. By incorporating a database of carbon emission factors for materials, BIM also enables more precise estimation of carbon performance.



Recycled, Low Carbon and Innovative Materials

1 GGBS CONCRETE



Ground Granulated Blast Furnace Slag (GGBS) Concrete

Concrete is one of the most common construction materials. However, its environmental impact, particularly from the use of cement is a major concern. This has led to the adoption of cement replacements like Ground Granulated Blast-furnace Slag (GGBS), a by-product of iron production that can be effectively repurposed. Incorporating GGBS into concrete can significantly reduce carbon emissions, potentially decreasing the overall carbon footprint of buildings.

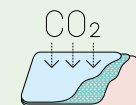
2 RECYCLED STEEL



Recycled Steel

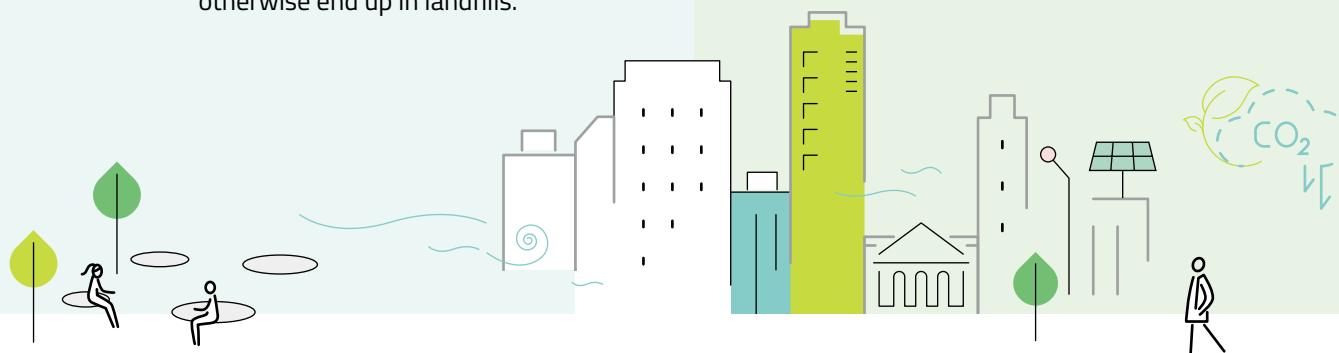
The process of recycled steel involves melting down steel scrap, which significantly consumes less energy and resources. Consequently, recycled steel has a reduced impact on global warming compared to virgin steel. Furthermore recycling steel aids in waste reduction as the material would otherwise end up in landfills.

3 CO₂ ABSORPTION



Carbon Absorption Materials

Carbon absorption materials capture and trap atmospheric carbon through a natural carbonation process. The use of carbon-absorbing materials is expected to grow in the future, potentially being incorporated into more forms of building structures to lower their carbon emissions.

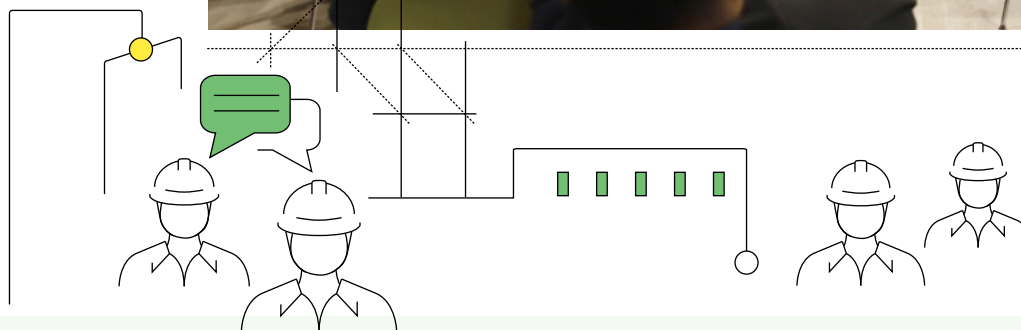


ACT TOGETHER

On the road towards carbon neutrality in the construction industry, significant challenges still need to be overcome. Without the collective effort of stakeholders and the entire community, this goal can hardly be attained. We recognise the utmost importance of connecting all stakeholders through diverse communication channels and platforms that advocate sustainable design and green building initiatives, while fostering a culture of collaboration, continual learning, and innovation. In this process, we organise various conferences, meetings, and training sessions to share insights and exchange experiences across the industry, advancing low-carbon design and construction in government buildings.

We believe if we Act Together, we can help shape a more sustainable, resilient, and low-carbon future.

'Let's have a Chat - Low Carbon Design and Construction in Government Building Projects' Engagement Workshop on 20 October 2023



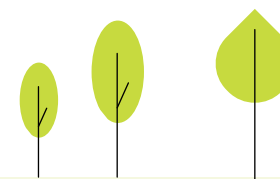


CONCLUSION

Globally, the pace at which climate change unfolds is much faster than anticipated. As a pivotal works agent responsible for the development and maintenance of public facilities in Hong Kong, we are taking a proactive stance through our Carbon Neutrality Strategic Framework. Our aim is clear: accelerating the transition to decarbonisation by harnessing smart, innovative, and green solutions.

We are dedicated to leveraging technology, adopting innovative strategies to meet the evolving landscape, and implementing initiatives that break new ground in environmental stewardship.

By working with all stakeholders, we can navigate towards a carbon-neutral future and play our part in turning the tide against climate change by adopting best practices in low-carbon building design and construction.





建築署

Architectural Services Department

