

Annexes for Media Release – Strengthening Resilience of the Built Environment Sector for the Next Bound of Industry Transformation

Annex A - Productivity Solutions Grant (PSG)

The PSG supports SMEs in the Built Environment sector who are purchasing pre-approved digital solutions to improve productivity¹. This includes digital platforms based on the Common Data Environment data standards, which will allow SMEs to plug into the Integrated Digital Delivery ecosystem.

2 The previous 3-year funding tranche of PSG ran from April 2020 to January 2023, benefiting over 800 firms. The Government will continue to encourage SMEs to transform and digitalise by setting aside \$21 million under a second funding tranche of BCA's PSG from April 2023 to March 2026. In the enhanced PSG, more pre-approved digital solutions will be introduced to help SMEs build digital capabilities and improve their productivity. There will be greater emphasis on training and capability building. SMEs can leverage the comprehensive training plans, including standard templates from solution providers, to support their digitalisation and staff training.

3 SMEs who are eligible can apply for the PSG to co-fund up to 50% of the qualifying costs of adopting pre-approved digital solutions. SMEs can make multiple applications across various solution categories, subject to a funding cap of \$30,000 per firm over 3 years (from April 2023 to March 2026).

4 Solutions under the PSG include digital solutions specific to Construction and Facilities Management sub-sectors such as 3D Modelling, Immersive Visualisation and Analysis, Quantity Surveying and Valuation, Coordination Tools and Collaboration Platform, and Facilities Management Workflow Automation are available for funding support under the PSG. The Construction and Facilities Management Industry Digital Plan (IDP) provides SMEs with a step-by-step guide on the digital solutions and necessary skills to adopt at each stage of their growth.

5 Applicants must meet the following eligibility criteria at the point of application²:

- The applicant must be a registered business in Singapore
- Have at least 30% local shareholding
- Company's Group annual sales turnover of not more than \$100 million or staff strength of not more than 200 employees
- Have its primary and/or secondary business activity in Construction and Facilities Management sub-sectors according to the Singapore Standard Industrial Classification Code (SSIC)

¹ These digital solutions that benefit SMEs were identified as part of the Construction and Facilities Management Industry Digital Plan (IDP). The IDP was jointly developed by BCA and the Infocomm Media Development Authority (IMDA) in partnership with SkillsFuture Singapore (SSG) and is part of IMDA's SMEs Go Digital programme, designed to help SMEs in Singapore go digital.

² The applicant must not have signed or confirmed a contract with or made payment to a supplier, vendor or third party in relation to the purchase/subscription of the solutions before the application. The submission of application does not automatically entitle the applicant to funding. All applications will be subject to evaluation and approval. Applicants may be required to submit additional supporting documents to facilitate evaluation of the application.

Annex B - Investment Allowance Scheme (IAS)

1 The IAS for the construction industry helps firms achieve higher levels of productivity through providing tax incentives for investments in productive construction equipment, including Robotics and Automation (R&A). The scheme allows firms to offset up to 50% of the approved fixed capital expenditure incurred on construction equipment and machinery against their taxable income. Over 100 applications from more than 60 firms have been supported since 2018 to make more than \$165 million worth of investments.

2 As we work towards enhancing the productivity of the Built Environment sector, the IAS will be extended for another 5 years until 2028.

3 Starting from 1 January 2024, BCA will raise the IAS eligibility criterion for the minimum capital investment *per application* from \$100,000 to \$1 million, while retaining the minimum capital investment per piece of equipment at \$100,000. Firms can tap on the IAS when investing in productive systems comprising several pieces of equipment to generate more impactful productivity improvements.

4 To apply, firms must meet the following criteria at the point of application³:

- The applicant must be a construction related business registered in Singapore
- The equipment must be new at the time of purchase and represent the latest advanced technology
- The applicant's purchase of the equipment must be used in Singapore
- The minimum total capital investment per application is \$1 million
- The minimum capital investment of each equipment must be at least \$100,000

Interested companies can visit the BCA website to apply or find out more.

³ *The applicant must not have signed or confirmed a contract with or made payment to a supplier, vendor or third party in relation to the purchase of the equipment before the application. The submission of application does not automatically entitle the applicant to the investment allowance. All applications will be subject to evaluation and approval. Applicants may be required to submit additional supporting documents to facilitate evaluation of the application.*

Annex C - CORENET X

1 CORENET X will be a one-stop integrated digital shopfront for regulatory submissions of building works. The regulatory agencies⁴ have worked closely with stakeholders from across the Built Environment sector, and Trade Associations and Chambers' representatives⁵ to streamline the current approval process (over 20 touchpoints across seven regulatory agencies) into a new coordinated approval process comprising three key submission milestones. This will transform the current workflow from an agency-centric to a customer-centric one, making the process less iterative, more collaborative and efficient. By leveraging Building Information Modelling (BIM), CORENET X will also reduce the need for downstream iterations, thereby reducing abortive work. Based on preliminary estimates (for a large BIM project), this may generate up to 250 to 300 manhours savings and could reduce the time for a firm to obtain regulatory approval across the development timeline by 20% to 25%.

2 CORENET X will be implemented progressively from end-2023. It will operate alongside the existing CORENET e-submission system for regulatory submissions of building works for a period to ensure a smooth cut-over.

Outcomes

- 3 CORENET X will bring about:
- a. Enhanced Service Delivery. Through the integrated submission process, the industry will enjoy a one-stop experience without having to deal with individual agencies in a piecemeal manner.
 - b. Better Coordinated Designs. Building a coordinated and interoperable BIM model will allow project stakeholders (especially consultants across various design disciplines, e.g. architectural/structural/Mechanical & Electrical) to work together to resolve conflicts, prior to regulatory submission. This will reduce errors and abortive works downstream during construction.
 - c. Reduced Iteration and Greater Productivity. With a more streamlined workflow, the number of iterations for regulatory submissions is expected to be reduced. Agencies will also iron out regulatory conflicts upfront before issuing a

⁴ CORENET X is co-led by the Building and Construction Authority (BCA) and Urban Redevelopment Authority (URA), alongside six other regulatory agencies: National Parks Board (NParks), Singapore Civil Defence Force (SCDF), Land Transport Authority (LTA), Public Utilities Board (PUB), National Environment Agency (NEA) and Singapore Land Authority (SLA), two public developers: Housing & Development Board (HDB) and JTC Corporation (JTC), and supported by the Government Technology Agency (GovTech)

⁵ CORENET X was developed in close collaboration with professional institutes such as the Singapore Institute of Architects (SIA), Real Estate Developers' Association of Singapore (REDAS), Association of Consulting Engineers, Singapore (ACES), Institution of Engineers, Singapore (IES), Singapore Contractors Association Limited (SCAL) and Singapore Institute of Surveyors and Valuers (SISV). Through a service journey design thinking approach, the co-creation involved a total of 91 practitioners comprising developers, architects, engineers, builders, and surveyors who participated in 8 workshops and 10 interviews.

coordinated response to QPs, which would create time savings for the development timeline.

Training Resources

4 In preparation for the transition to CORENET X, BCA has engaged BIM training providers to run IFC-SG⁶ training for industry practitioners. These have commenced since August 2022. The training aims to equip industry practitioners with the necessary skillsets required for CORENET X. In addition, a CORENET X website has been set up for industry practitioners to access the latest CORENET X related information and training materials, including an IFC-SG Resource Kit.

⁶ *Industry Foundation Classes - Singapore (IFC-SG) is an extension of the international open-BIM format IFC, which is platform-neutral and vendor-neutral. The localised "SG" extension addresses additional information which is required to fulfil our local regulatory requirements.*

Annex D - Mandatory Energy Improvement Regime

1 Buildings account for over 20% of Singapore's emissions. Greening our buildings is hence key in supporting our target to achieve net zero emissions by 2050. In 2021, we launched the latest edition of the Singapore Green Building Masterplan (SGBMP) to accelerate our transition to a low-carbon built environment. The SGBMP sets out our "80-80-80 in 2030" targets, which include greening 80% of our buildings by gross floor area (GFA) by 2030.⁷

2 Currently, BCA requires new buildings and existing buildings undergoing major retrofitting works or major energy use change to meet minimum energy performance standards. This ensures that new buildings are designed to be sustainable from the onset, and that existing buildings are upgraded to meet the prevailing sustainability standards when they undergo extensive works. BCA first introduced the minimum energy performance requirements in 2008 and last raised them in 2021 and 2022 following consultation with industry stakeholders. Under the latest requirements, all new buildings must be 50% more energy efficient than 2005 levels, and all existing buildings that undergo major retrofitting works or major energy use change must be 40% more energy efficient than 2005 levels.

3 These efforts have helped us to green close to 55% of our buildings by GFA. However, we still need to double down on our efforts to reduce emissions from the existing stock of older buildings with poor energy performance which are not subject to minimum energy performance standards. To reduce emissions from this group of buildings, BCA will be introducing a new Mandatory Energy Improvement (MEI) regime by the end of 2024.

4 The MEI requirements will apply to commercial buildings, healthcare facilities, sports and recreation centres and institutional buildings with GFA of 5,000 m² and above. Buildings within these typologies whose energy use intensity (EUI)⁸ falls above a predetermined threshold will be subject to the MEI requirements. This comprises two components:

- a. Energy Audit. Building owners will be required to appoint a professional to review the major energy-consuming systems in their building, and identify possible measures to improve energy efficiency and optimise energy use. The audit report will also contain a cost-benefit analysis of the measures to help building owners in their decision making.
- b. Energy Efficiency Improvement Plan (EEIP). Based on the audit findings, building owners will be required to develop and implement measures to improve their buildings' EUI. This can range from simple, low-cost measures (e.g. simple maintenance works like replacing faulty parts or sensors, installing monitoring instruments) to more complex retrofitting works. Building owners may also work

⁷ The other two targets are (i) for 80% of new developments by GFA to be Super Low Energy (SLE) buildings from 2030; and (ii) to achieve 80% improvement in energy efficiency from 2005 levels for best-in-class green buildings by 2030.

⁸ EUI measures the annual energy consumption of a building over GFA (in kWh / m²).

with their occupants and tenants through sustainability initiatives such as green leasing.⁹ Building owners will need to undertake these energy efficiency improvement measures within a stipulated timeframe, and maintain their improved EUI over a minimum period.

5 Through the MEI regime, building owners can expect to generate cost savings from the reduction in energy use. This will also reduce the overall environmental impact from building operations.

6 BCA will be conducting further engagements with the industry and the public on the details of the MEI regime and will provide further details when ready.

Building Energy Benchmarking

7 Since 2014, BCA has published the Building Energy Benchmarking Report (BEBR) annually to monitor the energy performance of existing buildings. The BEBR provides information on the overall EUI trend of buildings across the years and the EUI of benchmarked buildings broken down by quartiles. The BEBR is also accompanied by a listing of building energy performance data for individual commercial buildings. These publications allow building owners to determine their energy performance relative to other buildings of the same typology.

8 Going forward, BCA will expand the list to include more building types beyond commercial buildings, such as healthcare facilities, sport and recreation centres and institutional buildings. This will cover the types of buildings under the MEI regime. Buildings will also be ranked by energy performance against other buildings of the same typology. The next BEBR will be available on BCA's website¹⁰ by the end of March 2023.

⁹ This refers to a type of rental agreement where both building owners and tenants commit to efforts to reduce overall building energy consumption. Building owners can refer to BCA's Green Lease Toolkit for further information.

¹⁰ <https://www.bca.gov.sg/bess/benchmarkingreport/benchmarkingreport.aspx>

Annex E - Growth and Transformation Scheme (GTS)

1 The Growth and Transformation Scheme (GTS) supports initiatives that build best-in-class capabilities and enable holistic transformation for BE value chains. These initiatives are undertaken by groups of firms – each led by a progressive developer, and includes consultants, builders, and subcontractors – to achieve mutually beneficially transformation outcomes. The key objectives of the GTS are to:

- a. Groom a core group of strong industry leaders to drive industry transformation;
- b. Push the boundaries for best-in-class capabilities, and spearhead adoption of advanced technologies such as Advanced Manufacturing and Assembly (AMA), Integrated Planning and Design (IPD) and Sustainable Urban Systems (SUS); and
- c. Achieve transformative workforce development and business growth/strategic collaboration goals.

2 The GTS signals a significant shift from project-based support schemes, where stakeholders usually focus on implementing initiatives to deliver the project on hand. It encourages firms in the Built Environment sector to take a longer-term view and work collectively with their partners over a sustained project pipeline to transform business and human capital practices.

3 Since its announcement at MND COS 2021, BCA has worked with the industry to refine the scheme further. The Developer, as the main applicant, is required to work with its partners to develop a multi-year business plan, detailing how the group of firms will work collectively over multiple projects to meet more ambitious business transformation targets. Applicants are required to demonstrate that their proposed business plans and initiatives will meet all of the following outcomes:

| No. | Outcomes | Requirements |
|-----|---|--|
| 1 | Strategic Collaboration / Business Growth | <ul style="list-style-type: none"> • Proposals should demonstrate a clear plan for implementing collaborative contracting and project management. This could entail putting in place structured processes for regular progress reporting, early notification of potential problems and dispute resolution, to encourage all parties to resolve differences expeditiously in service of shared project objectives. Drafting of collaborative contracts, training and hiring of professionals with collaborative contracting experience can be supported. • Proposals to strengthen business fundamentals will also be considered (e.g. consultancy for business strategy development and process re-engineering/redesigning, etc.). These should go beyond basic business functions, such as accounting. • Proposals should include a collective investment of min S\$5 million in growth and local supply chain |

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| | | development ¹¹ which will yield at least 10% improvement in outcomes. ¹² |
| 2 | Human Capital Development | <ul style="list-style-type: none"> Proposals should detail the workforce transformation initiatives to increase productivity, as well as attract and develop talent across the value chain. Firms are required to submit their Human Capital Diagnostic Tool (HCDT)¹³ results and demonstrate that the proposed initiatives address gaps in their Human Capital practices. |
| 3 | Advanced Manufacturing and Assembly | <ul style="list-style-type: none"> Proposals should detail how more productive methods of construction will be implemented to achieve more than 30% (non-residential buildings) and 35% (residential buildings) increase in site productivity over 2010 levels in at least two projects. The initiatives can comprise process redesign initiatives, as well as robotics and automation solutions. |
| 4 | Integrated Planning and Design | <ul style="list-style-type: none"> Proposals should demonstrate a holistic view of digital transformation across the value chain and entire development/building lifecycle. Initiatives could include the development of a Common Data Environment to be used by all project partners, review and implementation of common data standards, integration of key functions such as procurement and contract management, or the setup of core digital teams to oversee and guide the implementation of the digital transformation initiatives. |
| 5 | Sustainable Urban Systems | <ul style="list-style-type: none"> New buildings are expected to achieve Green Mark 2021 Platinum Super Low Energy with Maintainability and Intelligence badges. This will yield at least 60% improvement in energy efficiency over the 2005 industry average. Proposals should also detail the initiatives to attain at least 20% manpower savings from process redesign and/or deployment of advanced technologies in Facilities Management. |

More information about the GTS can be found on BCA's website (<https://go.gov.sg/bca-gts>).

¹¹ These include investments in Design for Manufacturing and Assembly facilities, research and innovation initiatives, technology development and implementation, investment in IDD training for stakeholders along the BE value chain, investment in business process mapping to optimise value-chain workflows, investment in professional consultancy, and testing and verification in relation to technology development.

¹² For instance, if the firms invest in research and innovation on new sustainable materials, there should be 10% improvement in sustainability outcomes, which may include increased energy efficiency or a reduction in embodied carbon.

¹³ The HCDT (administered by the Institute of Human Resource Professionals) ascertains the HR maturity levels of companies and identifies areas for improvement in HR functions such as recruitment, performance management and employee engagement. More information on the HCDT is provided at: <https://www.ihrp.sg/hcdt/>