Factsheets for Media Release – Changes to the Building Control Act to enhance Energy Efficiency measures in Existing Buildings for a Sustainable Future

Annex A: Factsheet on Singapore Green Building Masterplan (SGBMP)

1 Buildings account for over 20% of Singapore's emissions. Greening our buildings is hence key in supporting our national target to achieve net zero emissions by 2050. In 2021, the latest edition of the Singapore Green Building Masterplan (SGBMP)[1] was launched to accelerate the transition to a low-carbon built environment. The SGBMP is a key pillar of the Singapore Green Plan 2030.

2 There are three key targets set out under the SGBMP, or **"80-80-80 in 2030"**:

a. **To green 80% of our buildings (by GFA) by 2030.** Efforts to support this target include:

- Raising baseline energy performance standards for new and existing buildings undergoing major retrofitting works or major energy use change in 2021 and 2022. This ensures that new buildings are designed with the optimal energy efficiency standard from the outset and existing buildings are upgraded to meet current energy efficiency standards when undergoing major works.
- The Green Mark Incentive Scheme for Existing Buildings 2.0 (GMIS-EB 2.0) was launched in 2022 to provide funding support to building owners to undertake energy efficiency retrofits.
- Implementing the new Mandatory Energy Improvement (MEI) regime in 2025, which will require existing energy-intensive buildings to undergo energy audits and implement energy efficiency

[1] More information on SGBMP can be found at https://www1.bca.gov.sg/buildsg/sustainability/green-building-masterplans

improvement measures to reduce their building's energy use intensity (EUI) (refer to **Annex B** for more details).

b. **For 80% of new developments (by GFA) to be Super Low Energy (SLE) buildings[2] from 2030.** Efforts to support this target include:
    - The Government taking the lead under the GreenGov.SG initiative by requiring all new and existing public sector buildings (upon next major retrofit) to achieve GM Platinum SLE standards or equivalent, where feasible.
    - Launched the Built Environment Transformation GFA Incentive Scheme in 2021 to encourage developers to take the lead in achieving GM Platinum SLE certification, among other requirements for their new private developments. This scheme offers up to 3% additional GFA as an incentive.
    - Enhanced requirements for sites sold under the Government Land Sales (GLS) programme in 2022 to require developments on GLS sites to meet the GM Platinum SLE certification, among other requirements.

c. **To achieve 80% improvement in energy efficiency (compared to 2005 levels) for best-in-class green buildings[3] by 2030.** Efforts to support this target include:
    - Supporting these buildings under the Green Buildings Innovation Cluster (GBIC) demonstration scheme. Under GBIC 2.0, we have shifted our efforts towards targeting buildings with the highest energy consumption and building owners/developers with the capacity to replicate the solutions across their building portfolio. In Feb 2023, we launched the 1st thematic challenge call, focusing on high rise commercial and hotel developments, with demonstration projects seeking at least 75% energy efficiency improvement from 2005 levels.

[2] SLE buildings refer to buildings that have achieved at least 60% improvement in energy efficiency compared to 2005 levels.
[3] Best-in-class buildings refer to buildings that achieve the highest possible energy efficiency standards with the technology available at the time

- Other efforts that will be rolled out to further support the push towards the 80% EE target by 2030 are as follows:
  i. GBIC Research and Innovation (R&I) Challenge Call: To supplement the 1st thematic challenge call, the R&I challenge call was recently **launched on 15 July 2024** for solution providers and building owners/developers to co-create and test-bed the following.
     - Innovation Cooling Technologies
     - Data-driven Smart Building Solutions
     - Advanced Building Ventilation Solutions
  ii. Tender for Consultancy Study for Design Prototyping for Decarbonisation (DPfD) Challenge: Launched on 6 Sep 2024, this tender focuses on high-rise commercial office, hotel and mixed development buildings. Its objective is to identify strategies and solutions to achieve 80% energy efficiency improvements from 2005 levels. The consultancy study will assess the technical feasibility and commercial viability of technologies and solutions with the aim of enabling building owners and developers to implement and scale up these solutions in their building portfolio.

Annex B: Factsheet on Mandatory Energy Improvement (MEI) Regime

Current Regulatory Regime for Building Environmental Sustainability

1 To raise the baseline sustainability standards of buildings, BCA requires new buildings and existing buildings undergoing major retrofitting works or major energy use change to meet minimum energy performance standards (Table 1)[4]. 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 requirements in 2008 and last raised the standards in 2021/2022 following consultations with industry stakeholders.

Table 1: Minimum Energy Performance Requirements

Building type	Minimum energy performance requirements (energy efficiency improvement over 2005 levels)	Effective date of latest requirements
New buildings	50%	Dec 2021
Existing buildings undergoing major retrofitting works[5]	40%	Dec 2021
Existing buildings undergoing major energy use change[6]	40%	Jun 2022

Mandatory Energy Improvement (MEI) Regime

2 To address the existing buildings that are considered energy intensive and are not subject to any requirement if they do not undergo retrofitting or major energy use change, BCA will be introducing the MEI regime in 2025. The MEI regime will require existing buildings that are consistently energy-intensive to undergo energy audits and undertake energy efficiency improvement measures.

[4] These requirements apply to building works with Gross Floor Area (GFA) of 5000 m2 or more.
[5] Major retrofitting works refer to building works that involve provision, extension or substantial alteration of the building envelope and building services in or in connection with an existing building.
[6] Major energy use change refers to the installation or replacement of chiller systems.

3 The MEI regime will apply to energy-intensive (i) commercial buildings; (ii) healthcare facilities; (iii) institutional buildings (namely education, civic, community and cultural buildings); and (iv) sports and recreation centres. The regime will only be applied to buildings with Gross Floor Area (GFA) of 5,000 m^2 and above to reduce the regulatory burden and compliance costs for smaller buildings.

4 Buildings are considered energy-intensive if their energy use intensity (EUI)[7] exceeds a predetermined EUI threshold over a period of three years. For a start, the predetermined EUI threshold will be pegged at the 75th percentile of the EUI range for each building typology or sub-typology[8]. In other words, the buildings that will be subject to the MEI regime are those that are consistently in the top 25% of their building sub-typology in terms of energy consumption over three years. The EUI threshold will remain fixed for a period of 5 years before the next review.

5 Building owners of buildings subject to the MEI regime will be required to do the following:

a. Carry out an energy audit: Appoint a qualified person (a Professional Engineer (Mechanical) or energy auditor registered with BCA) within 90 days from the issuance of the MEI audit notice to:

   - Conduct an energy audit of the building which will involve a review of the major energy-consuming systems in a building to identify possible measures to optimise energy use; and
   - Develop an Energy Efficiency Improvement Plan (EEIP) which reduces the building's EUI by at least 10% from pre-audit levels. The measures in the EEIP can range from simple, low-cost measures (e.g. simple maintenance works like replacing faulty parts / sensors, insulating hot water systems, installing monitoring instruments) to more extensive retrofitting works.

[7] EUI refers to the annual energy consumption of a building per unit of gross floor area (expressed in kilowatt hour (kWh) per square metre per year).
[8] The EUI thresholds will be established for the following typologies / sub-typologies: Retail, Hotel, Office, Hospital, Polyclinic/Private Clinic, Nursing Home, Education, Civic Community and Cultural, Sports & Recreation Centres.

b. Implement EEIP: Implement EEIP measures within three years from the submission of the audit report.

c. Maintain improved performance. Maintain the 10% reduction in EUI for a period of one year after implementation of the EEIP measures

6 Based on past projects, the average payback period for energy efficiency retrofitting works is approximately six years. Building owners also stand to benefit from the long-term energy cost savings throughout the building lifecycle, as well as other potential savings such as maintenance and manpower savings.

Penalties for failing to comply with the MEI Regime

7 Penalties for failing to comply with requirements under the MEI regime range from a fine of $10,000 to $150,000, depending on the severity of the offence. The fine may also be compounded in the case of a continuing offence. For example, a building owner who fails to implement the measures set out in the energy efficiency improvement plan is liable on conviction to a fine not exceeding $150,000, and in the case of a continuing offence, to a further fine not exceeding $1,000 for every day that the offence continues.

Collection of Building Energy Performance Data

8 Since 2013, BCA has progressively expanded the requirement for building owners to submit their building energy performance data on an annual basis to more building types. Today, BCA collects building energy performance data from (i) commercial buildings; (ii) healthcare facilities; (iii) educational institutions; (iv) civic, community and cultural institutions; and (v) sports and recreation centres, with Gross Floor Area (GFA) 5,000 m^2 and above. This information will be used by BCA to determine which buildings are energy-intensive and subject to the MEI regime.

9 To further step up the pace of greening buildings, BCA has also started to identify buildings by name in the publication of energy performance data, starting with commercial buildings since 2021. This allows building owners to determine their

energy performance relative to other buildings in their category, and whether they will likely be subject to the MEI regime.

Financial support for Building Owners

10 Building owners choosing to undertake more significant energy efficiency retrofits can tap on the GMIS-EB 2.0. The $63 million GMIS-EB 2.0 was launched in Jun 2022 to help building owners lower the upfront capital cost of energy efficiency retrofits. Under the scheme, building owners can receive grants based on the emissions reduction achieved through retrofitting, subject to a cap for each project (Table 2). Building projects that pursue higher standards of energy performance (e.g. Super Low Energy (SLE) or Zero Energy (ZE)) will be eligible for higher rates of funding support.

Table 2: Funding Factor and Grant Cap for GMIS-EB 2.0

Qualifying Criteria (GM Rating)	**Funding Factor per unit of emissions reduction**	**Funding Cap**
GM Platinum	$25/tCO2e	$600,000 or up to 50% of qualifying cost, whichever is lower
GM SLE	$35/tCO2e	$900,000 or up to 50% of qualifying cost, whichever is lower
GM ZE	$45/tCO2e	$1,200,000 or up to 50% of qualifying cost, whichever is lower

11 The GMIS-EB 2.0 is available to privately-owned buildings with GFA of 5,000 m^2 or more that undergo retrofitting works to improve their energy efficiency. Building owners will have the flexibility to employ appropriate design strategies and technologies, based on a list of works approved by BCA,[9] to improve the energy efficiency of their buildings. Some examples of funded works include:

a. Retrofits to cooling systems, lighting and lifts;

[9] BCA will also review if other items that are not in the list can be eligible for funding.

b. Installation of solar photovoltaics or other renewable energy sources;

c. Installation of building automation systems and sensors; and

d. Redesigning spaces to incorporate natural ventilation or hybrid cooling.

Annex C: Factsheet on building profiles that have benefitted from energy efficiency improvement works

Project 1: Singapore Thong Chai Medical Institution

Organisation: **Singapore Thong Chai Medical Institution.** **Consultant involved in energy improvement works: Comfort Management Pte Ltd**	**Project : Singapore Thong Chai Medical Institution** 

About the Project

The Thong Chai Building at Chin Swee Road is a ten-storey office building with a charitable clinic, with a total GFA of about 5314 m^2, owned by the Singapore Thong Chai Medical Institution (STCMI).

Recognising the importance of reducing energy consumption, STCMI initiated efforts to enhance the building's energy performance through energy efficiency (EE) retrofits. To achieve the goal, STCMI worked closely with the Comfort Management Pte Ltd to identify areas of improvement from chiller plant upgrades, replacement of air handling units and cooling towers to more energy efficient models and the signing of energy performance and maintenance contracts to ensure that the performance of the retrofitted system continues to be maintained and improved.

Comfort Management Pte Ltd provided the technical expertise and implemented the EE retrofits. The works involved a total replacement of an aged water-cooled cooling system to a highly energy efficient chiller plant system and an efficient air-distribution system with controls to better cater to the cooling demand. In addition, the building lighting system was replaced with a more energy efficient LED lighting system. An energy management system with measurement and instrumentation for intelligent control was incorporated for better monitoring of the building system's performance.

Following the completion of the retrofit in 2022, STCMI recorded significant annual reduction in the building energy consumption, compared to pre-retrofit level. The building's Energy Use Intensity (EUI)[10] has improved significantly by about 40% to 106 kWh/m^2.yr, which outperformed BCA's average EUI for office buildings of 210 kWh/m^2.yr. This also translates to about 40% reduction in annual electricity bills.

The building was awarded BCA's Green Mark Platinum in May 2022.

About Singapore Thong Chai Medical Institution

The Singapore Thong Chai Medical Institution (STCMI) is a non-government organisation which was established as a charitable clinic since 1867, providing free medication consultation and Traditional Chinese Medicine to the public.

About Comfort Management Pte Ltd

Comfort Management Pte Ltd has been certified by Singapore Green Building Council (SGBC) with the highest grade (Level 1) under the Green Services Certification[11] – Energy Performance Contracting for Chiller Plant Retrofitting and Air-Conditioning System Maintenance. It is an established Energy Services Company (ESCO) accredited by the National Environment Agency (NEA). It provides quality energy audit services and has good track records in the implementation of energy conservation projects for buildings and facilities.

[10] Energy Use Intensity (EUI) refers to the annual energy consumption of a building per unit of gross floor area (expressed in kilowatt hour (kWh) per square metre per year).

[11] The Singapore Green Building Services (SGBS) certification scheme is administered by the Singapore Green Building Council (SGBC) to give recognition to building consultants who are committed to supporting the green movement and strive to promote best practices to support environmental sustainability among building services providers. Under this scheme, the key criteria considered in grading the building services providers are (a) staff competencies and development, (b) green corporate practices in the entire business value chain, (c) support for green community, and lastly (d) track record in delivery of sustainability related projects. There are four grades in this certification scheme with Level 1 being the highest grade.

Project 2: The Gateway

Organisation: **Singapore Land Group (SingLand)** **Consultant involved in energy improvement works: Comfort Management Pte Ltd.**	**Project : The Gateway** 

About the Project

The Gateway, developed by Singapore Land Group (SingLand), is a pair of 37-storey office towers located along Beach Road. Completed in 1990, it comprises two buildings (Gateway East and Gateway West) and two basement levels with a total GFA of 97,430m^2.

As part of ongoing efforts to improve the environmental performance of its portfolio, SingLand has been undertaking energy efficiency (EE) retrofits to improve The Gateway's environmental performance over the years. In 2023, detailed retrofitting works were completed which further improved the 34-year-old building's EE. Prior to the commencement of works, SingLand worked closely with Comfort Management Pte Ltd to identify improvement areas – from chiller plant upgrades, replacement of air handling units and cooling towers to more energy efficient models and the signing of energy performance and maintenance contracts to ensure that the performance of the retrofitted system continues to be maintained and improved.

Comfort Management Pte Ltd provided the technical expertise and implemented the EE retrofits. The works involved upgrading of the existing chiller plant to a highly efficient chiller plant system with lower environmental impact, optimisation of the operating condition of the plant room, redesign of the air-distribution system and controls to better cater to the cooling demand. An energy management system

with measurement and instrumentation for intelligent control was incorporated for better monitoring of the building system's performance.

Following the completion of the retrofit in 2023, The Gateway recorded substantial annual reduction in the building energy consumption, compared to pre-retrofit level. The building's Energy Use Intensity (EUI) improved significantly by more than 30% to 135 kwh/m^2.yr, and outperformed BCA's average EUI for large office buildings of 210 kWh/m^2.yr. This also translates to about 30% reduction in annual electricity bills.

The building was awarded BCA's Green Mark Platinum in Oct 2022.

About SingLand

Singapore Land Group Limited (SingLand), previously known as United Industrial Corporation Limited (UIC), is a premier real estate company listed since 1971. Its commercial assets in Singapore currently include 2.7 million square feet of office space and 1 million square feet of retail space. SingLand is a subsidiary of UOL Group Limited.

About Comfort Management Pte Ltd

Refer to Project 1