**Information Template to be submitted for Green Mark Assessment**

|  |  |
| --- | --- |
| **Items** | **Remarks** |
| **Appendix A:**  Mock Certificate and Publicity Information | To be checked and signed by the Client/Developer Representative. |
| **Appendix B:**  Project Factsheet | To be verified with assessor during Green Mark assessment. |
| **Appendix C:**  New Residential Buildings: Summary On Electricity Consumption  And Savings | To be verified with assessor during Green Mark assessment. |
| **Appendix D:**  Non-Residential Buildings: Summary On Electricity  Consumption And Savings | To be verified with assessor during Green Mark assessment. |

**Submitted by**

|  |  |
| --- | --- |
| Name |  |
| Designation |  |
| Email |  |
| Contact No |  |
| Date of submission |  |

# **APPENDIX A: MOCK CERTIFICATE AND PUBLICITY INFORMATION**



AWARD

**(SLE/Platinum/GoldPLUS)**

***(do not strikethrough / delete. No award is confirmed until LOA is received***

Presented to

**(Actual project name)**

**(Address)**

Contact person for Certificate / Plaque Collection

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Expected TOP Date | 14/12/2022 |  | Name |  |
| Actual TOP Date (if received) |  |  | Designation |  |
|  |  |  | Email |  |
|  |  |  | Telephone |  |

## Key Contact Persons

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Team** | **Name** | **Organisation** | **Designation** | **Contact No** | **Email** |
| Applicant |  |  |  |  |  |
| Architect |  |  |  |  |  |
| Project Manager |  |  |  |  |  |
| 1st Contact Person |  |  |  |  |  |
| 2nd Contact Person |  |  |  |  |  |
| Green Mark Project  Coordinator |  |  |  |  |  |

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## Information for Green Mark Building Directory

|  |  |
| --- | --- |
| ***Information released to public*** | ***Requirement*** |
| asdff   |  |  |  | | --- | --- | --- | |  | **Full Name of Organisation** | | | **Client / Developer / Building Owner** |  | | | **Facility Management** |  | | | **Project Manager** |  | | | **Architect** |  | | | **M&E Engineer** |  | | | **Structural Engineer** |  | | | **Quantity Surveyor** |  | | | **Main Contractor** |  | | | **Landscape Consultant** |  | | | **ESCO / ESD Consultant** |  | | | **Others**  **(Pls specify)\*\***  **\*\* Please rename and state nature of consultancy** |  | | |  | |  | | **Number of Joint Venture Companies for Client/Developer/Owner**  **(if applicable)** | |  | | **Image MUST be included on this page. Please resize to fit in the rectangle given.**  **(A low resolution image may be used here for illustration purpose. This image must be the same as the high resolution soft copy)**  Particularly for client/developer/building owner’s company, if the company is a subsidiary of another company, please ensure the main company’s name or the subsidiary company’s name should be used for the publicity. **Information should be verified with main company**. Please include all JV companies if applicable.  Project manager is only for company that involve solely for project management. In most cases, it should be left blank. It should not be the same as the main contractor.  Please ensure that punctuations, spellings of all company names are correct. Please check registered names at www.acra.gov.sg if necessary.  Please put “NA” for non-JV development (this refers to client/developer/owner only) |

|  |  |
| --- | --- |
| ***Information released to public*** | ***Requirement*** |
| **Description of Project: (types of use, size, no. of storey, location etc)**   |  | | --- | | **Project Name:**  **GFA:**  **Project Address:**  **District Code:** | |  | | **List of other prominent green features** | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 |   https://sleb.sg/Building/GreenmarkBuildingsDirectory | \*Description is for publicity and is not the formal BP project description. It should be in **structured sentence** format limited to 3-4 sentences.  Note: A guide for number of features - 5 (GoldPLUS), 7 (Platinum). **Additional green features that exceed the above stated number may not be published**. Features should be arranged in the order of GM criteria with a full stop at the end of each point. Each green feature cannot be more than 20 words long.  Examples of standard phrases   1. Chiller plant system with efficiency of 0.60kW/ton. 2. Permanent measurement and verification instrumentation for the monitoring of chilled-water plant efficiency and heat balancing. |

## Information for Green Mark Building Directory

All information inputted in this appendix will be made available to public

|  |
| --- |
| Properties of this development (for search function) |
| |  |  |  | | --- | --- | --- | | |  | | --- | |  | | Efficient Air-con System | | |  | | --- | |  | | Efficient lighting system | | |  | | --- | |  | | Integrated Energy Management & control Systems | | |  | | --- | |  | | Onsite or Offsite Renewable Energy | | |  | | --- | |  | | Use of Sustainable Material / Equipments | | |  | | --- | |  | | Use of UVGI system | | |  | | --- | |  | | Good Acoustic Control | | |  | | --- | |  | | Low Embodied Carbon | | |  | | --- | |  | | Use of Low Carbon Concrete | | |  | | --- | |  | | Use of Green Lease | | |  | | --- | |  | | Sustainable Procurement | | |  | | --- | |  | | Extensive Greenery | | |  | | --- | |  | | Use of Smart Facilities Management Technologies | | |  | | --- | |  | | Use of Robotics & Automation in FM | | |  | | --- | |  | | Use of BIM | | |  | | --- | |  | | Use of Smart Products | |

# **APPENDIX B: PROJECT FACTSHEET**

## Building Information

|  |  |  |  |
| --- | --- | --- | --- |
| EUI (in kWh/m²/yr) |  | WWR (between 0 to 1) |  |
| ETTV Value (W/m²) |  | RETV value (W/m²) |  |
| Building Type |  |  |  |
| GFA (m²) |  | Air-Con Area (m²) |  |
| Carpark Area (m²) |  | Non Air-Con Occupied Area (m²) |  |
| Site Area (m²) |  | Non Air Con areas (circulation areas, common areas and M&E spaces)(m²) |  |
| Blocks |  | Storeys |  |

## Saving Details

|  |  |  |
| --- | --- | --- |
| **Key KPIs** | Estimated Saving | Remarks |
| Energy Saving |  | % saving compared to code compliance building |
|  | kwh energy saving per year (kwh/yr) |
|  | $ savings per year (assume $0.20 per kWh) |
| CO2 emission reduction per year |  | Express in tonne of CO2. (Singapore’s Grid Emission Factor (GEF) is 0.4085 kg CO2/kWh in 2019. 1 tonne of CO2 is equivalent to 1000kg of CO2. Overseas projects should use country’s GEF for calculations.) |
| Renewable energy |  | kWh collected per year |

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## Air-Conditioning Information

|  |  |  |  |
| --- | --- | --- | --- |
| A/C system plant efficiency  (kW/ton) |  | Air side efficiency  (kW/ton) |  |
| Chiller configuration  (eg 2 x 500 tons) |  | Total System efficiency (kW/ton) |  |
| Total Cooling Load (tons) |  | Installed Cooling Capacity  (tons) |  |
| Cooling load (w/m2)  (Cooling Load per A/C areas) |  | **Total Cooling Load x 3715 (W)**  **Air-Con Area (m2)** | |
| Main type of A/C system | Others, please specify |  | |

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## Overall Cost of Green Building

**(All values stated should be based on S$ )**

|  |  |  |  |
| --- | --- | --- | --- |
| **Ref** | **Description** | **Value** | **Remarks** |
| A | Construction /Retrofitting Cost $ (exclude GST) |  |  |
| B | Total floor Area (m²) |  | Include all covered area e.g. carpark |
| C | Unit construction / retrofitted Cost ($/m²) |  | A/B |
| D | Overall green premium cost ($) |  | Including EE & non EE |
| F | Overall % increase in construction cost due to green features (%) |  |  |

## Cost/Benefit of Green Features

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Category** | **List of green features** | **Base cost**  **(A)** | **Investment cost**  **(B)** | **Green cost ($)**  **(C) = (B) – (A)** | **Potential savings (kWh/yr for energy)**  **(D)** | **Potential saving ($/yr) (D) x 0.2** | **Payback on Premium (years)**  **(C)/(D)** |
| **Energy Efficiency** | Air Conditioning System | $ 12,540,000 | $ 14,621,000 | $ 2,081,000 | 3,154,765 | $ 630,953 | 3.3 |
| Artificial Lighting | $ 525,000 | $ 1,500,000 | $ 975,000 | 1,165,990 | $ 233,198 | 4.2 |
| Lift System | $ 1,652,152 | $ 1,762,846 | $ 110,694 | 27,995 | $ 5,599 | 19.8 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  | Total |  |  | $ 3,166,694 | 4,348,750 | $ 869,750 | 3.6 |

**LCCA for Energy Efficiency Features**

LCCA is used to determine the holistic cost of greening and identify the cost benefits of a BCA Green Mark Building over its lifecycle. The analysis also helps project team to understand how the net positive savings achieved during the building operation over its life span outweigh the upfront investment cost.

***To provide the LCCA documentation -* Pls attach the detailed LCCA (either in Excel or pdf form) under additional supporting documents section in GMO. The details must clearly demonstrate that the below mentioned parameters are used to conduct the LCCA.**

**Summary Table (numbers in the below table are for illustrative purpose only)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Green Mark Building Cost (Based on invested Cost)** | | **Non-Green Mark Building Cost (Based on Base Cost)** | |
| **Items** | **Total Building Escalated Life-Cycle Cost (30-years period) - $** | **Total Building NPV Life-Cycle Costs (30-years period) - $** | **Total Building Escalated Life-Cycle Costs (30-years period) - $** | **Total Building NPV Life-Cycle Costs (30-years period) - $** |
| *Capex Cost* | *31,638,800* | *31,638,800* | *27,247,680* | *27,247,680* |
| *Replacement Cost* | *24,460,120* | *23,296,000* | *20,599,538* | *19,619,000* |
| *Operating (utilities) Cost* | *40,292,318* | *19,576,000* | *79,028,095* | *38,395,000* |
| *Maintenance Cost* | *33,424,891* | *16,866,000* | *29,704,845* | *14,975,000* |
| *End-of-Life Cost* | *0* | *0* | *0* | *0* |
| *Life-Cycle Cost within Period (Total)* | *129,816,130* | *91,376,800* | *156,580,159* | *100,236,680* |

|  |  |
| --- | --- |
| **Building GFA** | *68915* |
| **NPV savings (B-A)** | *100,236,680-91,376,800* |
| **NPV Savings/GFA** | *129* |

*Note:*

1. *Electricity Tariff: use $0.2/kWh*
2. *NPV: Net Present Value*
3. *To calculate total building LCC, the team should consider capex cost, replacement cost, operating cost, maintenance cost and End – of life Cost*
4. *Suggested Replacement Years*

* *Water-cooled chilled water system – 20 yrs.*
* *Air-cooled chilled water system – 15 yrs*
* *Unitary AC system – 10 yrs*
* *ACMV demand control – 10 & 20 yrs.*
* *Mechanical Ventilation System – 15 yrs.*
* *BIPV/PV – 15 yrs.*
* *Lift & Escalators – 20 yrs.*
* *Heat Pumps – 20 yrs.*

1. *Parameters for LCC*

* *Building Life Span – 30 yrs.*
* *Escalation Rate (p.a) - 1.5%*
* *Discount Rate - 5.0%*
* *Incremental Maintenance – 3.0%*
* *Utilise Cost – 0.2/kWh*
* *Façade Maintenance – 1$/sqft*

**Cost of Other Green Features (Non-Energy related)**

|  |  |  |
| --- | --- | --- |
| **Category** | **List of green features** | **Green cost (S$)** |
| **Intelligence** |  |  |
| **Health and Wellbeing** |  |  |
| **Whole of life Carbon** |  |  |
| **Maintainability** |  |  |
| **Resilience** |  |  |
|  | Total cost |  |

# **APPENDIX C: NEW RESIDENTIAL BUILDINGS: SUMMARY ON ELECTRICITY CONSUMPTION AND SAVINGS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Items** | **Estimated**  **Load (kW)** | **Daily Usage**  **(hr)\*** | **Load per day**  **(kWh)** |
| **A** | **B** | **A X B** |
|  |  |  |  |
|  |  |  |  |

\* Hours used is based on a typical residential building

|  |  |  |
| --- | --- | --- |
| **Items** | **Formula** | **Value** |
| Total kWh per day | ∑ (AxB) |  |
| Total Energy Consumption per year (kWh/year) for common areas | ∑ (AxB) x 365 |  |
| Gross Floor Area (m²) | C |  |
| EEI for Common Facilities (kWh/m²/yr) EEI-Common  (item to update for appendix B) | [∑ (AxB) x 365]  C |  |

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## ELECTRICITY CONSUMPTION FOR DWELLING UNITS A/C

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | | **Estimated Load (kW)** | | **Daily Usage (hr)** | **Load per day (kWh)** | |
| A/C load for all apartment units | |  | | 8 |  | |
| **Total kWh per day (D)** | | | |  |  | |
| **Items** | | **Formula** | | | **Value** | |
| Total Energy Consumption per year (kWh/year) for all units A/C | | D x 365 | | |  | |
| Gross Floor Area (m²) | | C | | |  | |
| EEI for all units A/C (kWh/m²/yr)) EEI-A/C | | D x 365  C | | |  | |

## ESTIMATED ENERGY SAVING PER YEAR FOR GREEN FEATURES

|  |  |  |
| --- | --- | --- |
|  |  |  |
| **Green Features** | **Estimated Energy Saving**  **Per Year# (kWh)** | **Distribution of Energy Saving\***  **(%)** |
| Dwelling Units A/C |  |  |
| Lighting for common areas |  |  |
| Car Park MV System |  |  |
| Others |  |  |
| Total Energy Saving |  |  |

\* Distribution of energy saving is percentage of estimated energy saving per year for each green features over total energy consumption per year for both common areas and all units A/C

# Details calculation of energy saving for each green features shall be enclosed

# **APPENDIX D: NON-RESIDENTIAL BUILDINGS: SUMMARY ON ELECTRICITY CONSUMPTION AND SAVINGS**

## NEW NON-RESIDENTIAL BUILDINGS (Applicable for pathway 3)

|  |  |  |  |
| --- | --- | --- | --- |
| **System/ Equipment** | **Proposed Model Energy Consumption (kWh/yr) (A)** | **Reference Model Energy Consumption (kWh/yr)**  **(B)** | **Energy Savings (%)**  **(A-B)/A** |
|  |  |  |  |
| **Total Building Energy Consumption** |  |  |  |

The above table should be based on actual receptacle load. Please include another table if 25% cap on receptacle load is applied.

Items listed are based on typical building. Items could be added for better description.

1. Chilled Water System (chillers, water pumps and cooling towers)
2. Chilled Water Air Handling and Fan Coil Units

# Details calculation of energy saving for each SYSTEM shall be enclosed

## EXISTING NON-RESIDENTIAL BUILDINGS

|  |  |  |  |
| --- | --- | --- | --- |
| **State the scope of the green / energy efficient improvement works.**  **E.g. replacement of chiller plant, installation of T5 lightings, LED,** CO sensor for carpark, etc. | Total Building Energy Consumption BEFORE retrofit (kWh/yr)(A) | Estimated Total Building Energy Consumption AFTER retrofit (kWh/yr)(B) | Energy savings (%)(A-B)/A |
|  |  |  |  |
| **Total Building Energy Consumption** |  |  |  |