



BCA Green Mark for Existing Schools

Version 1.0

Green Mark Assessment Criteria for Existing Schools (Version 1.0)

Pre-requisites to achieve GREEN MARK CERTIFIED

ENERGY EFFICIENCY

BUILDING ENERGY EFFICIENCY

Comply with any option below:

Option A: Demonstrate 5% energy savings over the last three years (against own historical baseline)

Option B: Top 80th percentile in building energy performance i.e.

- EUI of 46.5 kWh/m²/yr for Primary schools
- EUI of 42 kWh/m²/yr for Secondary schools
- EUI of 65 kWh/m²/yr for Junior Colleges

BUILDING ORIENTATION & NATURAL VENTILATION – [to achieve 10 points]

LIGHTING SYSTEMS EFFICIENCY

- Achieve lighting density of 15% better than lighting power budget in SS530

ENERGY MONITORING

- Energy consumption monitoring by tracking of energy bills
- Disclosure and communication of energy usage trends to staff and students (posters, graphs, etc)

ENERGY POLICY & MANAGEMENT

- Education of staff and students on energy use and management through classroom curriculums.
- Creating awareness for continual energy improvement and communicate target reductions to staff and students
- Commitment to specify energy efficient equipments (air-conditioners, office equipments, lightings, etc) during replacement exercise.

OFFICE EQUIPMENT– [to achieve 2 points]

WATER EFFICIENCY

- Water consumption monitoring by tracking of water bills
- Disclosure and communication of water usage trends to staff and students (posters, graphs, etc)
- Education of staff and students to learn and complete the water audit through the website www.pub.gov.sg/wateraudit
- To achieve PUB's Water Efficient Building Certification

SUSTAINABLE AWARENESS & MANAGEMENT

Sustainability Awareness & Education - [to comply with section 3-1(a) and 3-1(b)]

Post Occupancy Evaluation - (to comply with section 3-3)

Waste Management - [to comply with section 3-4(a) to 3-4(b)]

Public transport accessibility – [at least 2 points]

INDOOR ENVIRONMENTAL QUALITY

Air-conditioned areas (e.g. General Office, Staff Room, Library, etc) to meet NEA Guidelines for Good Indoor Air Quality in Office Premises and to be verified during Green Mark assessment.

Illuminance (lux) level to comply with SS531 / CP38 for various uses.

Indoor thermal environment (Temperature and relative humidity) to comply with SS553 / CP13.

Internal Noise Level to comply with SS553 / CP13.

POINT ALLOCATION

| ASSESSMENT CRITERIA | | POINTS AVAILABLE | PREQUISITIES | |
|--|--|------------------|--------------|----------|
| ENERGY EFFICIENCY (To achieve minimum 25 points) | | | | |
| Minimum 30 points to be scored | Part 1 – Energy Efficiency | | | |
| | 1-1 Energy Efficiency | 10 | 2 | |
| | 1-2 Percentage of non air-conditioned areas | 10 | 5 | |
| | 1-3 Building Orientation & Natural Ventilation (<i>Applicable to naturally ventilated areas</i>) | 15 | 10 | |
| | 1-4 Active Design (<i>Applicable to air-con and mechanical ventilated areas</i>) | 15 | - | |
| | 1-5 Lighting Systems Efficiency | 13 | 6 | |
| | 1-6 Energy Monitoring | 5 | 2 | |
| | 1-7 Energy Policy & Management | 4 | 3 | |
| | 1-8 Office Equipment | 5 | 2 | |
| | 1-9 Renewable Energy / Energy Efficient Features [BONUS] | 10 | - | |
| Subtotal (Part 1) 1-1 to 1-9 | | 87 | 30 | |
| OTHER GREEN REQUIREMENTS (To achieve minimum 25 points) | | | | |
| Minimum 20 points to be scored | Part 2 - Water Efficiency | | | |
| | 2-1 Water Monitoring and Water Efficiency Management | 6 | 4 | |
| | 2-2 Water Efficiency Indices and Improvement Plans | 6 | - | |
| | 2-3 Water Efficient Fittings | 8 | 4 | |
| | 2-4 Alternative Water Sources | 2 | - | |
| | Subtotal (Part 2) | | 22 | 8 |
| | Part 3 - Sustainable Awareness & Management | | | |
| | 3-1 Sustainability Awareness & Education | 6 | 2 | |
| | 3-2 Building Operation & Maintenance | 4 | - | |
| | 3-3 Post Occupancy Evaluation | 2 | 2 | |
| | 3-4 Waste Management | 4 | 2 | |
| | 3-5 Environmental Protection | 4 | - | |
| | 3-5 Greenery | 6 | - | |
| | 3-6 Public Transport Accessibility | 3 | 2 | |
| | Subtotal (Part 3) | | 29 | 8 |
| | Part 4 - Indoor Environmental Quality | | | |
| | 4-1 Indoor Air Quality Performance | 4 | 1 | |
| | 4-2 Lighting Quality | 2 | 1 | |
| | 4-3 Thermal Comfort | 2 | 1 | |
| | 4-4 Internal Noise Level | 1 | 1 | |
| 4-5 Outdoor Thermal Environment | 4 | - | | |
| Subtotal (Part 4) | | 13 | 4 | |
| Part 5 – Other Green Features [BONUS] | | | | |
| Subtotal (Part 5) | | 10 | - | |
| GRAND TOTAL | | 161 | 50 | |

To achieve GREEN MARK GOLD & above

Energy Related Requirements
(87 Points Available)



Other Green Requirements
(74 Points Available)

Part 1 - Energy Efficiency (87 points)

- 1-1 Energy Efficiency (10 points)
- 1-2 Percentage of non air-con areas (10 points)
- 1-3 Passive Design (15 points)
- 1-4 Active Design (15 points)
- 1-5 Lighting System Efficiency (13 points)
- 1-6 Energy Monitoring (5 points)
- 1-7 Energy Policy & Management (4 points)
- 1-8 Office Equipment (5 points)
- 1-9 Renewable Energy / Energy Efficient Features (10 points)

Part 2 - Water Efficiency (22 points)

- 2-1 Water Monitoring and Efficiency Management (5 points)
Sub-metering for major water uses
- 2-2 Water Efficiency Indices and improvement plans (3 points)
- 2-3 Water Efficient Fittings (12 points)
(PUB WELS)
- 2-4 Alternative Water Sources (2 points)
(for irrigation, washing, water features, etc)

Part 3 – Sustainable Awareness & Management (29 points)

- 3-1 Sustainability Awareness & Education (6 points)
- 3-2 Building Operation & Maintenance (4 points)
- 3-3 Post Occupancy Evaluation (2 points)
- 3-4 Waste Management (4 points)
- 3-5 Environmental Protection (4 points)
- 3-6 Greenery (6 points)
- 3-7 Public Transport Accessibility (3 points)

Part 4 - Indoor Environmental Quality (13 points)

- 4-1 Indoor Air Quality Performance (4 points)
- 4-2 Lighting Quality (2 points)
- 4-3 Thermal Comfort (2 points)
- 4-4 Internal Noise Level (1 point)
- 4-5 Outdoor Thermal Environment (4 points)

Part 5 – Other Green Features (10 points)

Green Mark Award Rating

| Green Mark Points | Green Mark Rating |
|-------------------|---------------------------------|
| 90 and above | Green Mark Platinum |
| 85 to <90 | Green Mark Gold ^{Plus} |
| 75 to <85 | Green Mark Gold |
| 50 to <75 | Green Mark Certified |

To achieve the Green Mark Gold, Gold^{Plus} and Platinum rating, the project has to meet the following pre-requisite requirements:

For Green Mark Gold Rating

- Minimum systems efficiency – Unitary air-conditioners or Air-cooled centralized chiller plant efficiency ≥ 2.92 (equivalent to 2 ticks rating) **OR**
- Commitment letter to specify air-conditioners with efficiency ratings equivalent to 4 ticks ratings or better during replacement exercise.

For Green Mark Gold^{Plus} Rating

- Minimum systems efficiency – Unitary air-conditioners or Air-cooled centralized chiller plant efficiency ≥ 3.34 (equivalent to 3 ticks rating)
- Commitment letter to specify air-conditioners with efficiency ratings equivalent to 4 ticks ratings or better during replacement exercise.
- At least 10 points under Water Efficiency (Part 2)
- At least 6 points under Sustainability Awareness & Education (Part 3-1)

For Green Mark Platinum Rating

- Minimum systems efficiency – Unitary air-conditioners or Air-cooled centralized chiller plant efficiency ≥ 3.76 (equivalent to 4 ticks rating)
- Commitment letter to specify air-conditioners with efficiency ratings equivalent to 4 ticks ratings or better during replacement exercise.
- At least 12 points under Water Efficiency (Part 2)
- At least 8 points under Sustainability Awareness & Education (Part 3-1)
- Measures implemented to reduce urban heat island effect (e.g. applying heat reflective coatings, vertical greenery, green roof, etc)

Energy Related Requirements

| Part 1 - Energy Efficiency (Total Points: 87) | Green Mark Points |
|---|---|
| <p>1-1 Energy Efficiency (10 points)</p> <p>(a) To achieve increased building energy efficiency against similar building types to promote efficient use of energy.</p> <p><u>Option A</u></p> <p>Option A is applicable for buildings where energy benchmarks are not available. Energy savings over its own historical baseline over the last three years must be demonstrated.</p> <p><u>Option B</u></p> <ul style="list-style-type: none"> - EUI of 46.5 kWh/m²/yr for Primary schools - EUI of 42 kWh/m²/yr for Secondary schools - EUI of 65 kWh/m²/yr for Junior Colleges | <p><u>Option A</u></p> <p>2 points for achieving 5% energy savings from own historical baseline</p> <p>0.3 point for every subsequent percentage improvement from baseline of 5% energy savings</p> <p><u>Option B</u></p> <p>2 points for achieving the stated energy benchmarks</p> <p>0.1 point for every subsequent percentile improvement from baseline of the stated energy benchmarks. See Appendix A for percentile graph.</p> <p>(up to 10 points)</p> |
| <p>1-2 Percentage of non air-conditioned areas based on total GFA (10 points)</p> | <p>0.1 point for every percentage of non air-conditioned areas excluding carpark areas</p> <p>(up to 10 points)</p> <p><i>Pre-requisite Requirement: 5 points from this section</i></p> |
| <p>1-3 Building Orientation and Natural Ventilation (15 points)</p> <p>(a) Minimum direct west facing façade through building design orientation.</p> <p>Note: Orientation of façade that falls within the range of 22.5° N of W and 22.5° S of W will be defined as west facing façade. Core walls for lifts or staircases and toilets that are located within this range are exempted in computation.</p> <p>(b)(i) Minimum west facing window openings.</p> | <p><i>Applicable to Naturally Ventilated Building Areas</i></p> <p>Points awarded = 5 – 0.1 x (% of west facing facade areas over total façade areas)</p> <p>(Up to 5 points)</p> <p>Where there is no west facing façade, the total points awarded for this item will be <u>15 points</u>; the items 1-3 (b)(i) and (b)(ii) as listed below will not be applicable.</p> <p>Points awarded = 2.5 - 0.1 x (% of west facing window areas over total west facing façade areas)</p> |

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| <p>(b)(ii) Effective sunshading provision for windows on the west façade with minimum shading of 30%.</p> <p>(c) Proper design of building layout that utilizes prevailing wind conditions to achieve adequate cross ventilation.</p> | <p>Points awarded = $0.025 \times (\% \text{ of west facing window areas with sunshading devices over total west facing façade areas})$ (Up to 5 points for 1-3 b(i) & b(ii))</p> <p>0.5 point for every 10% of units with window openings facing north and south directions Points awarded = $0.5 \times (\% \text{ of units } / 10)$ (up to 5 points)</p> <p>Pre-requisite Requirement: 12 points from this section</p> |
| <p>1-4 Active Design (15 points)</p> <p>a) Mechanical fan system Power budget (W/m^2) for the mechanical ventilation system should be calculated.</p> <p style="text-align: center;">OR</p> <p>(b) Unitary Air-Conditioners/Condensing Units/Air-Cooled Centralised Plant :</p> <ul style="list-style-type: none"> ▪ Single-Split Unit ▪ Multi-Split Unit ▪ Variable Refrigerant Volume (VRV) System ▪ Air-cooled Chiller and pumps ▪ Packaged Units <p>*If all unitary air conditioners are rated minimum 2 ticks under the NEA Energy Labeling Scheme, <u>7</u> points will be awarded.</p> | <p><i>Applicable to Air-conditioned/Mechanical Ventilated Building Areas (>500m²)</i></p> <p>2 points for achieving Efficiency of 0.47 W per m³/h for constant air volume fan and 0.74 W per m³/h for variable air volume fan</p> <p>1 point for every subsequent 1% improvement from 0.47 W per m³/h or 0.74 W per m³/h (Up to 15 points)</p> <p style="text-align: center;">OR</p> <p>2 points for achieving Efficiency of 2.4 COP</p> <p>1 point for every subsequent 0.1 COP improvement from 2.4 COP (Up to 15 points)</p> <p><i>Note: Where there is a combination of (a) and (b), the computation of the points awarded will be based on the pro-ration of points based on floor area ventilated by active design</i></p> |
| <p><u>1-5 Lighting System (13 points)</u></p> <p>To encourage optimization of lighting system efficiency</p> <p>(a) Lighting power budget</p> | <p>6 points for achieving lighting density of 15% better than lighting power budget in SS530</p> <p>0.2 point for every subsequent percentage improvement from baseline lighting density of 15% better than lighting power budget in SS530 Points awarded = $0.2 \times (\% \text{ improvement } 15\% \text{ better than lighting power budget in SS530})$ (Up to 10 points)</p> |

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| <p>(b) Photo/Motion sensors for common areas</p> <p>Encourage the use of energy efficient design and control of lighting in the following areas:</p> <p>(i) Toilets (ii) Staircases</p> <p>(c) Controllability of lighting system</p> | <p>Extent of coverage : At least 90% of applicable areas</p> <p>Points awarded based on each applicable area – 0.5 points for each area</p> <p>(Up to 1 point)</p> <p>Occupants are able to adjust lighting control to suit their task needs and preference</p> <p><u>Office Areas</u> > 50% controlled by task lights - 1 point > 100% controlled by task lights - 2 points</p> <p>(up to 2 points)</p> |
| <p>1-6 Energy Monitoring (5 points)</p> <p>(a) Energy usage monitoring by tracking of energy bills. Monthly energy bills and summary of energy bills should be provided. The Energy Use Intensity (EUI) should be computed and submitted.</p> <p>(b) Disclosure and communication of energy usage trends to staff and students (e.g. by means of graphic poster displayed at prominent common areas)</p> <p>(c) Sub-metering for building systems to track energy consumption of major uses</p> <p>(d) Energy Management System (EMS) to facilitate monitoring and trend logging of school's energy consumption, e.g. lighting, air-conditioning, etc. Display of real time energy consumption via EMS at common area, e.g. atrium, lobby, canteen</p> | <p>1 point</p> <p>1 point</p> <p>1 point</p> <p>2 point</p> |
| <p>1-7 Energy Policy and Management (4 points)</p> <p>(a) Education of staffs and students on energy use and management through classroom curriculums.</p> <p>(b) Creating awareness for continual energy usage reduction and communicating target reductions to staff and students through regular distribution of posters, guides, and emails.</p> | <p>1 point</p> <p>1 point</p> |

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| <p>(c) Commitment to specify energy efficient equipment (air-conditioners, office equipment, lightings, etc) during replacement exercise.</p> <p>(d) Energy policy, energy targets and regular review with Principal, Vice-Principal, Key Persons, Managing Agents, etc.</p> | <p>1 point</p> <p>1 point</p> |
| <p>1-8 Office Equipment (5 Points)</p> <p>Encourage the use of energy efficient office equipment in general office, staff room, computer rooms, etc</p> <p>Use of energy efficient office equipment such as</p> <ul style="list-style-type: none"> ▪ Computers ▪ Laptops ▪ Monitors ▪ Fax machine ▪ Printers ▪ Photocopiers | <p>Points awarded based on the number and energy efficient rating of the equipment used</p> <p>(Up to 5 points)</p> <p>*Schools which has achieved Green Mark for Office Interior certification will be entitled to 5 points</p> <p><i>Pre-requisite Requirement: 2 points from this section</i></p> |
| <p>1-9 Renewable Energy / Energy Efficient Features (10 Bonus Points)</p> <p>Encourage the application of renewable energy Sources or energy efficient features in buildings.</p> <ul style="list-style-type: none"> ▪ Solar energy and other renewable energy sources ▪ Sun pipes ▪ Heat recovery system ▪ Re-generative lift ▪ Light shelves ▪ Heat pumps ▪ Other energy efficient features | <p>2 points for every feature installed (may be for educational purposes)</p> <p>(Up to 10 Bonus Points)</p> |

Other Green Requirements

| Part 2 - Water Efficiency (Total Points: 22) | Green Mark Points |
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| <p>2-1 Water Monitoring and water efficiency management (6 points)</p> <p>(a) Water usage monitoring by tracking of water meter/s readings. Provision of water meter reading (at least monthly) tracking system. Tracking system can include the use of online automated meter readings. Monthly water bills and summary of water bills should be provided.</p> <p>(b) Disclosure and communication of water usage trends to staff and students (e.g. by means of graphic poster displayed at prominent common areas such as canteen)</p> <p>(c) Education of staff and students on water conservation and management through classroom curriculum. Involve students to learn and complete the water audit through the website (www.pub.gov.sg/wateraudit)</p> <p>(d) Creating awareness for continual water usage reduction and communicating target reductions to staff and students through regular distribution of posters, guides, and emails.</p> <p>(e) Provide the use of private water meters and leak detection system for better monitoring and control at major water usage area (e.g. water features, irrigation, swimming pool, tenants' usage)</p> | <p>1 point</p> <p>1 point</p> <p>2 points</p> <p>1 point</p> <p>1 point</p> |
| <p>2-2 Water Efficiency Indices and improvement plans (6 points)</p> <p>(a) To achieve building water performance against own building water performance baseline.</p> <p>(b) To achieve the following water efficiency indices:</p> <ul style="list-style-type: none"> - WEI of 8 l/p/d for Primary School - WEI of 13 l/p/d for Secondary School - WEI of 20 l/p/d for Junior College | <p>2 points for achieving 10% water savings from own historic baseline</p> <p>2 points for achieving the stated water benchmarks</p> |

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|--|---|-------|------------|--------------|-----------|--------|-------------|
| <p>(c) The plan should include targets to improve water performance. To show intent, measures and implementation strategies of water efficiency improvement plans over the next three years. Committed water savings accrued from proposed measures should be quantified. Completed Water Efficiency Management Plan submitted to PUB can be considered.</p> | <p>2 points</p> | | | | | | |
| <p>2-3 Water Efficient Fittings (8 points)</p> <p>Encourage the use of water efficient fittings under Water Efficiency Labeling Scheme (WELS) or adopt equivalent water efficient flow-rate/flush volumes for water fittings.</p> <ul style="list-style-type: none"> ▪ Basin taps and mixers ▪ Showers ▪ Sink/Bib taps and mixers ▪ Urinals <p>Use of dual flushing low capacity flushing systems under the Water Efficiency Labeling Scheme (WELS) or adopt equivalent water efficient flush volumes.</p> | <p><u>Rating based on Water Efficiency Labeling Scheme (WELS)</u> Very Good – 4 points Excellent – 6 points</p> <p>Points awarded based on the number and water efficiency rating of the fitting type used (Up to 6 points)</p> <p><i>*A PUB Water-Efficient Building would be entitled to 4 points.</i></p> <p><u>Rating based on Water Efficiency Labeling Scheme (WELS)</u> Good – 1 point Very Good – 1.5 points Excellent – 2 points</p> <p>(Up to 2 points)</p> | | | | | | |
| <p>2-4 Alternative Water Sources (2 points)</p> <p>Use of suitable systems that utilize alternative water sources for non-potable uses: irrigation, washing, water features, water to reduce use of potable water. Alternative sources can include rainwater, greywater, NEWater, AHU condensate and recycled water from approved sources.</p> | <p>Points awarded based on % reduction in potable water usage of the applicable uses</p> <table border="0"> <tr> <td>> 20%</td> <td>- 2 points</td> </tr> <tr> <td>10 % to 20 %</td> <td>- 1 point</td> </tr> <tr> <td>< 10 %</td> <td>- 0.5 point</td> </tr> </table> | > 20% | - 2 points | 10 % to 20 % | - 1 point | < 10 % | - 0.5 point |
| > 20% | - 2 points | | | | | | |
| 10 % to 20 % | - 1 point | | | | | | |
| < 10 % | - 0.5 point | | | | | | |
| <p>Part 3 - Sustainable Awareness & Management (Total Points: 29)</p> | <p>Green Mark Points</p> | | | | | | |
| <p>3-1 Sustainability Awareness & Education (6 points)</p> <p>(a) Awareness talks / Assembly talks to students on environmental sustainability topics</p> <p>(b) School-wide environmental programs involving concepts of reduce, recycle, and reuse. (e.g. recycling competition, organizing a water conservation week)</p> | <p>1 point</p> <p>1 point</p> | | | | | | |

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| <p>(c) Community Involvement Projects on Environmental Sustainability / Green club / Environment Club</p> <p>(d) Appointment of green activists / green champion in each class to promote and ensure green practices are carried out.</p> <p>(e) Involvement of staffs and students through voluntary programs and events to impart knowledge on Green/Energy Efficient technologies/water conservation through hands on exercise and demonstration. Best practices to reduce energy use, water use and maintain a good indoor environment should be documented. To demonstrate evidences of staff and student involvement in environmental sustainability.</p> | <p>1 point</p> <p>1 point</p> <p>2 points</p> <p>(If achieve School's Green Audit Award by Singapore Environment Council Orchid Award – 1 point Lotus Award – 2 points) OR (If participate in GreenWave award by Sembawang Shipyard Participation – 1 point Award of Prize – 2 points)</p> |
| <p>3-2 Building Operation & Maintenance (4 points)</p> <p>(a) Environmental policy set in place to identify and control environmental impacts.</p> <p>(b) Building management plan or strategy that reflects the sustainability goals set for the building and its systems must be in place. It should adequately address all the Green Mark criteria and any other relevant aspects of building sustainability.</p> <p>(c) The plans must be disseminated, actively implemented and regularly reviewed.</p> <p>(d) Facility management team comprises one Certified Green Mark Facility Manager (GMFM) and/or Certified Green Mark Manager (GMM) and/or Singapore Certified Energy Manager (SCEM).</p> | <p>1 point</p> <p>1 point</p> <p>1 point</p> <p>1 point</p> |
| <p>3-3 Post Occupancy Evaluation (2 points)</p> <p>(a) Conduct post occupancy evaluation annually that should include technical performance, energy and environmental performance, cost-effectiveness and occupant's satisfaction.</p> <p>The minimum number of people surveyed should be around 10% of total staff population or 30 whichever is larger.</p> <p><i>*Note that the POE sample templates will be provided in technical guide.</i></p> | <p>1 point</p> |

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| <p>(b) List of corrective actions taken following the post occupancy evaluation, if any.</p> | <p>1 point</p> |
| <p>3-4 Waste Management (4 points)</p> <p>(a) Provision of recycling facilities /infrastructure for sorting and separate collection of recyclable waste for recycling (e.g. plastics, glass, paper, metals, equipment, addition & alterations) at strategic locations (e.g. canteen, school hall, sport facilities, office, etc)</p> <p>(b) Promote and encourage waste minimization and recycling among student, tenants, cleaners and visitors through various avenues including regular briefings, meetings, putting up waste minimization and recycling posters at strategic locations</p> <p>(c) Provision of a waste storage area to promote waste sorting, collecting, quantifying, monitoring and recycling of a large range of waste generated in-house. Types of waste recycled:</p> <ul style="list-style-type: none"> • Glass waste • Paper waste • Metal waste (including drink cans) • Plastic waste • Other wastes – e.g. Printer cartridges, used electronic equipment, food waste <p>(d) In-house composting of horticulture waste and use of compost produced within the school</p> | <p>1 point</p> <p>1 point</p> <p>1 point</p> <p>1 point</p> |
| <p>3-5 Environmental Protection (4 points)</p> <p>Minimise airborne contaminants, mainly from inside sources to promote a healthy indoor environment.</p> <p>(a) Use of sustainable and environmental-friendly products with at least 30% recycled content by weight or volume OR use of products that are certified under the Singapore Green Label Scheme (SGLS)</p> | <p>1 point for high impact item 0.5 point for low impact item</p> <p>(Up to 2 points)</p> |

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| <p>(b) Green procurement policy – Adoption of sustainable and environmental-friendly procurement and purchasing policy in the operation and maintenance of the building.</p> <p>(c) Reduce the potential damage to the ozone layer and the increase in global warming through the release of ozone depleting substances and greenhouse gases.</p> <ul style="list-style-type: none"> Refrigerants with ozone depletion potential (ODP) of zero or with global warming potential (GWP) of less than 100 | <p>1 point</p> <p>1 point</p> |
| <p>3-6 Greenery (6 points)</p> <p>(a) Greenery Provision (GnP) is calculated by considering the 3D volume covered by plants using the following Green Area Index (GAI) : Grass GAI = 1 ; Shrubs GAI = 3; Palms Trees GAI = 4; Trees GAI = 6</p> <p>(b) Provision of vertical greening</p> <p>(c) Provision of green roof and rooftop garden</p> <p><i>Usable area is deemed as available roof spaces (including sloping roofs) that are free from M&E equipment and able to support greenery on top, as opposed to the total roof footprint</i></p> | <p>GnP = 0.5 to < 1.0 - 0.5 point GnP = 1.0 to < 1.5 - 1 point GnP = 1.5 to < 3.0 - 1.5 points GnP ≥ 3.0 - 2 points</p> <p>(Up to 2 points)</p> <p>≥10 sqm and <50 sqm of green wall areas (1 point)</p> <p>≥ 50 sqm of green wall areas. (2 points)</p> <p>(Up to 2 points)</p> <p>≥20% and <50% of useable roof areas or < 300 m² (1 point)</p> <p>≥ 50% of useable roof areas or ≥ 300 m² = 2 points (2 points)</p> <p>(Up to 2 points)</p> |
| <p>3-6 Public Transport Accessibility (3 points)</p> <p>Promote the use of public transport or bicycles to reduce pollution from individual car use with the following provision:</p> <p>(a) Good access to nearest MRT/LRT or bus stops</p> <p>(b) Provision of covered walkway to facilitate connectivity and use of public transport</p> <p>(c) Adequate bicycles parking lots</p> | <p><i>Pre-requisite Requirement: Any 2 points from this section</i></p> <p>1 point</p> <p>1 point</p> <p>1 point</p> |

| Part 4 – Indoor Environmental Quality (Total Points: 13) | Green Mark Points |
|---|--|
| <p>4-1 Indoor Air Quality Performance (4 points) To promote a healthy indoor environment.</p> <p>(a) Air-conditioned areas (e.g. General Office, Staff Room, Library, etc) to meet NEA Guidelines for Good Indoor Air Quality in Office Premises and to be verified during Green Mark assessment.</p> <p>(b) To conduct an IAQ audit once in three years that complies with Guidelines for Good Indoor Air Quality in Office Premises or Singapore Standard Code of Practice for 'Indoor air quality for air-conditioned buildings' (SS 554:2009) by SINGLAS accredited laboratories.</p> <p>(c) Implement effective IAQ management plan to ensure ventilation systems are clean and free from residuals left over from construction activities. Internal surface condition testing for ACMV systems is to be included.</p> | <p>1 point</p> <p>2 points</p> <p>1 point</p> |
| <p>4-2 Lighting Quality (2 points) To encourage good workplace lighting quality to promote productivity and occupant comfort</p> <p>(a) Lighting level to comply with SS531 / CP38 for various uses</p> <p>(b) High frequency ballast</p> | <p>1 point</p> <p>All applicable areas in the entire building that are served by fluorescent luminaries</p> <ul style="list-style-type: none"> > 60% - 0.5 point > 90% - 1 point <p>(Up to 1 point)</p> |
| <p>4-3 Thermal Comfort (2 points)</p> <p>(a) Comfort Level to comply with CP13 / SS553:2009 (Temperature and relative humidity) *Applicable to air-conditioned areas only.</p> <p>(b) Measures and reminders to maintain air-conditioning set-point to 24 Degrees Celsius or higher for all air-conditioned rooms</p> | <p>1 point</p> <p>1 point</p> |

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| <p>4-4 Internal Noise Level (1 point)</p> <p>Ensure internal noise level are maintained at an appropriate levels and to comply with CP13 / SS553:2009</p> | <p>1 point</p> |
| <p>4-5 Outdoor Thermal Environment (4 points)</p> <p>Encourage to use any combination of following strategies to improve the outdoor thermal comfort and reduce heat island</p> <p>(a) Use of paving materials with Solar Reflectance Index > 29</p> <p>(b) Use of heat reflective paint on walls</p> | <p>2 points</p> <p>2 points</p> |
| <p>Part 5 – Other Green Features (Total Points: 10)</p> | <p>Green Mark Points</p> |
| <p>5-1 Green Features and Innovations</p> <p>To encourage the use of other green features which are innovative or/and have positive environmental impact.</p> <p>Examples :</p> <ul style="list-style-type: none"> • High Volume Low Speed (HVLS) Fans in large spaces • Use of self cleaning façade system • Use of grey water recycling system for toilet washing • Recycling of AHU condensate • Use of non-chemical termite treatment system such as termite baiting system, anti-termite mesh • Titanium Dioxide solutions to remove odour in toilets • Ultraviolet light-C band (UV) emitters in all air handling units (AHUs) to improve indoor air quality | <p>2 points for high impact item</p> <p>1 point for medium impact item</p> <p>0.5 point for low impact item</p> <p>(Up to 10 Bonus Points)</p> |

Appendix A



