



## An Overview of Skyrise Greenery Initiatives in Singapore Greening Singapore's High-Rise Urban Landscape

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Photography by National Parks Board  
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Over the years, Skyrise Greenery has impacted Singapore's high-rise urban landscape, elevating green relief from our street-scapes skywards and bringing it closer to urban inhabitants. Celebrating 50 years of greening, the National Parks Board Singapore (NParks) continues to espouse skyrise greening as part of its "City in a Garden" vision.

One of the key thrusts of the City in a Garden vision is to optimise urban spaces and infrastructure for greenery and recreation, which is attained through this form of multi-dimensional greening. Skyrise Greenery encompasses the greening of both horizontal (rooftop greenery) and vertical (green walls) dimensions. It strives to create a harmonious balance between urban development and our natural heritage, which is a challenge for Singapore, as it is faced with physical land constraints. Hence, rooftop greenery and green walls pose as an ideal alternative to deal with this dilemma.

Today, Singapore has achieved more than 55 hectares of green roofs, ranking among the top cities in the world in terms of green roof coverage. In 2009, the Inter-Ministerial Committee on Sustainable Development (IMCSD) unveiled the Sustainable Singapore Blueprint, which sets out strategies and initiatives for Singapore to achieve both economic growth and a good living environment over the next two decades. Under the blueprint, an additional 30 hectares of Skyrise Greenery is targeted to be achieved by 2020 and 50 hectares by 2030. Since 2009, 27.6 additional hectares have already been achieved.

Singapore has managed to attain this substantial amount of green coverage through various initiatives and outreach avenues initiated by NParks.

### Incentives for Skyrise Greenery

Skyrise Greenery in Singapore has evolved from simple green roofs to more elaborate forms of space utilisation, such as rooftop gardens, community gardens, and edible gardens, proving to be an effective



1. Edible garden at Bedok View Secondary School.

2. Edible garden at New Town Primary School.



- 3. Rooftop garden at Nanyang Polytechnic.
- 4. Vertical greenery at Tanglin Trust School.
- 5. Vertical greenery at INSEAD Asia Campus.
- 6. Vertical greenery at F1 Pit Building.

innovative solution to our physical land constraints. In order to encourage such innovative utilisation of rooftop and vertical spaces, NParks launched the Skyrise Greenery Incentive Scheme (SGIS), which aims to encourage building owners and developers to retrofit their existing buildings with greenery by providing them with financial incentives.<sup>1</sup> First launched in 2009, it was previously known as the Green Roof Incentive Scheme. SGIS has since incorporated changes alongside changing trends to include not only rooftop greenery but also vertical greenery. This incentive scheme subsidises up to 50 percent of the installation costs of green rooftops, with a cap at 75 SGD per square metre, and 750 SGD per square metre for vertical greenery. All buildings that have achieved a minimum TOP (Temporary Occupation Permit) date of six months are eligible to apply.

To date, this scheme has seen a wide variety of building types that have been successfully reimbursed. For example, educational institutions such as Bedok View Secondary School and New Town Primary School have transformed their rooftop spaces into edible gardens. With the aid of community volunteers, students, and teachers, the vegetables and herbs grown there are harvested and shared among the needy. Nanyang Polytechnic, on the other hand, has retrofitted its existing rooftop space and transformed it into a lush green study corner for its students to relax. Other institutions, such as Tanglin Trust School and INSEAD Asia Campus, have implemented green walls within their premises to soften their existing hardscapes.

Commercial buildings, such as Hotel Rendezvous and F1 Pit Building, have dressed up their premises with green walls, creating green relief amidst the bare monotonous concrete surfaces. Utility and transport infrastructures, such as Marina South Pier and Sentosa Imbiah station, have creatively greened up their facilities to create a more pleasant environment for its users.

Health and Medical care centres, such as KK Women's and Children's Hospital and Changi General Hospital, have also utilised NParks' incentive scheme to green their premises in order to bring the therapeutic effects of greenery closer to their patients. Private residential properties, such as Liang Seah Place, have also converted their shared rooftop space into a green recreational space for its occupants. Residences at Emerald Hill also boast an impressive stretch of green wall lining their front façade.

#### Skyrise Greenery Awards

NParks also organises the Skyrise Greenery Awards (SGA). Since 2008, this award has provided recognition for projects exemplify-

ing outstanding building design that integrates Skyrise Greenery through innovative means.<sup>2</sup> Held once every two years, this award seeks to encourage and recognise the creative design intentions of integrating rooftop and vertical greenery into the Singapore built environment. SGA has produced winning projects, such as 158 Cecil Street, Khoo Teck Puat Hospital, and Orchard Central, to name a few.

For SGA 2013, the jury comprises representatives from NParks, the Landscape Industry Association (Singapore), Building and Construction Authority (Singapore), Singapore Green Building Council, Singapore Institute of Architects, Singapore Institute of Landscape Architects, and Urban Redevelopment Authority (Singapore).

To further cultivate this greening initiative, SGA 2013 is expanding the building types eligible for the awards and working to provide recognition for community-based projects. Three types of awards will be given out for SGA 2013. These include the: "Outstanding Skyrise Greenery Project Award", which will be awarded to the single project with the most outstanding Skyrise Greenery development; "Skyrise Greenery Excellence Awards", which will be awarded to projects that demonstrate excellence in Skyrise Greenery designs; and "Skyrise Greenery Special Award", which will be given to entries that deserve special mentions.

#### International Skyrise Greenery Conference

The International Skyrise Greenery Conference (ISGC) seeks to provide a platform for knowledge sharing among industry partners, academia, and political figures, both locally and internationally.<sup>3</sup> The last conference held in 2010 attracted more than 450 delegates from 28 countries. The conference was the first of its kind in the Asia-Pacific region to cover not only green roofs but also vertical greenery. Held over a period of three days, ISGC 2010 allowed participants to explore a range of discussion topics and get an exclusive viewing of various Skyrise Greenery projects around Singapore.

The second ISGC will be integrated with Green Urban Scape Asia, an international landscape trade exhibition and conference event, which will take place in Singapore from November 7 to 9, 2013. Green Urban Scape Asia is co-organised by NParks, Landscape Industry Association Singapore, Singapore Institute of Landscape Architects, and Singex Group. This conference will be held biannually from this year onwards.

The theme for ISGC 2013 is "Density and Greenery: Evolving Into Collaborative Cities". The creation of Skyrise Greenery is becom-


ing ever more complex with increased design aspirations, space constraints, and development densities posing as challenges faced by many metropolises. Hence, by addressing this issue, ISGC seeks to create a multi-disciplinary and collaborative knowledge exchange between the various Skyrise Greenery stakeholders.

### Skyrise Greenery Research

Keeping abreast with the latest industry trends, the Centre for Urban Greenery and Ecology (CUGE) has also developed a series of publications and carried out research that addresses good design and management practices so as to improve consistency in the industry and promote safe practices. These guidelines and publications seek to aid stakeholders in overcoming implementation barriers. Currently, there are nine guidelines that have been developed under the CS E series, *Guidelines for Skyrise Greenery*.<sup>4</sup>

These include the following:

- Guidelines on Design Loads for Rooftop Greenery (CS E01:2010)
- Guidelines on Design For Safety on Rooftop Greenery (CS E02:2010)
- Guidelines on Substrate Layer for Rooftop Greenery (CS E03:2010)
- Guidelines on Filter, Drainage and Roof Penetration Barrier Layers for Rooftop Greenery (CS E04:2010)
- Guidelines on Waterproofing for Rooftop Greenery (CS E05:2012)
- Guidelines on Irrigation for Rooftop Greenery (CS E06:2012)
- Guidelines on General Maintenance for Rooftop Greenery (CS E07:2012)
- Guidelines on Design and Construction on Pitched Green Roof (CS E08:2012)
- Guidelines on Planting or Tree, Palms and Tall Shrubs on Rooftops (CSE09:2012)

Other research carried out includes studies on the effect of Skyrise Greenery and suitable planting palettes for rooftop and vertical greenery, and concise guides to skyrise greening. 

<sup>1</sup> National Parks Board. Last modified November 20, 2012. "Skyrise Greenery Incentive Scheme." Accessed May 2, 2013. [http://www.skyrisegreenery.com/index.php/home/incentive\\_scheme/about/](http://www.skyrisegreenery.com/index.php/home/incentive_scheme/about/)

<sup>2</sup> National Parks Board. 2013. "Skyrise Greenery Awards." Accessed May 2, 2013. [http://www.skyrisegreenery.com/index.php/home/awards/SGA\\_main/](http://www.skyrisegreenery.com/index.php/home/awards/SGA_main/)

<sup>3</sup> Green Urban Scape Asia. 2013. "International Skyrise Greenery Conference." Accessed May 2, 2013. <http://www.internationalskyrisegreeneryconference.com>

<sup>4</sup> National Parks Board. 2013. "Skyrise Greenery Guidelines." Accessed May 2, 2013. <http://www.skyrisegreenery.com/index.php/home/guidelines>



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7. Green wall at Sentosa Imbiah Station (Photo: Uniseal Creative Solutions Pte Ltd).

8. Green wall at Residences at Emerald Hill.

9. Green roof at Marina South Pier.

10. Green roof at KK Women's and Children's Hospital (Photo: Elmich Pte Ltd).

11. Green roof at Liang Seah Place.