Project Title

Keep the Heat Out

Project Lead and Members

Project members: Aaden Tan, Caiyi Lee, Ryan Thio

Organisation(s) Involved

SingHealth HQ

Healthcare Family Group(s) Involved in this Project

Healthcare Administration

Applicable Specialty or Discipline

Healthcare Administration

Aims

Prompt the need for proactive measures to enhance the overall comfort experienced by individuals, both thermal and visual discomfort. To create an environment that not only addresses the thermal and visual concerns but also ensure a more pleasant waiting experience for all passengers at the SingHealth Tower shuttle bus pick up point

Background

See poster appended/ below

Methods

See poster appended/ below

Results

See poster appended/ below

Conclusion

See poster appended/ below

Project Category

Workforce Transformation

Product Development

Keywords

Transportation, Energy Consumption Reductions, Solar Radiation, Portable Air Coolers, Solar Firms, Shuttle Bus, Contingency Plan

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Keep the Heat Out

Singapore Healthcare Management 2023

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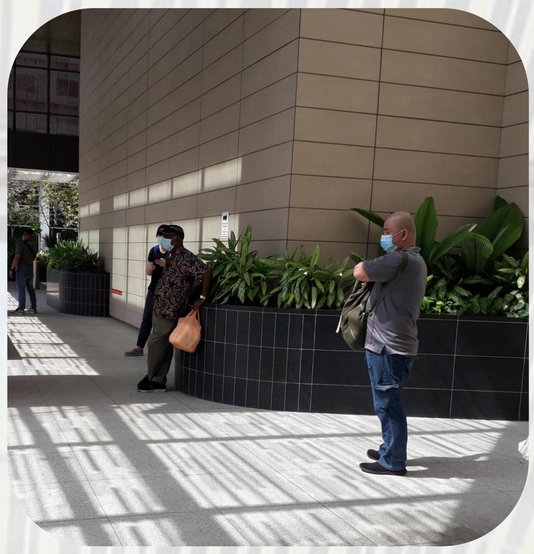
SingHealth HQ

SingHealth

Introduction

In SingHealth Tower shuttle bus pick-up point, a noticeable trend was passengers awaiting their transportation have been subjected to both thermal and visual discomfort. The observations prompts the need for proactive measures to enhance the overall comfort experienced by individuals. In order to guide these improvements, the energy reduction strategies established by the Building Construction Authority (BCA) serve as a reference point. Drawing upon the guideline, it becomes possible to create an environment that not only addresses the thermal and visual concerns but also ensure a more pleasant waiting experience for all passengers at the SingHealth Tower shuttle bus pick up point.



Methodology

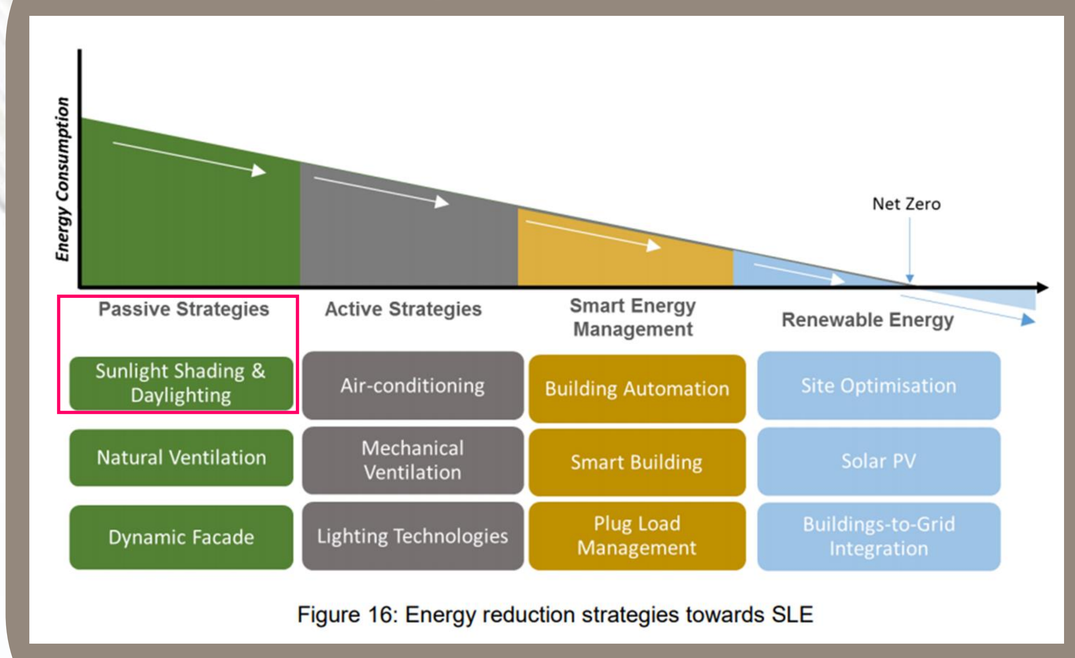
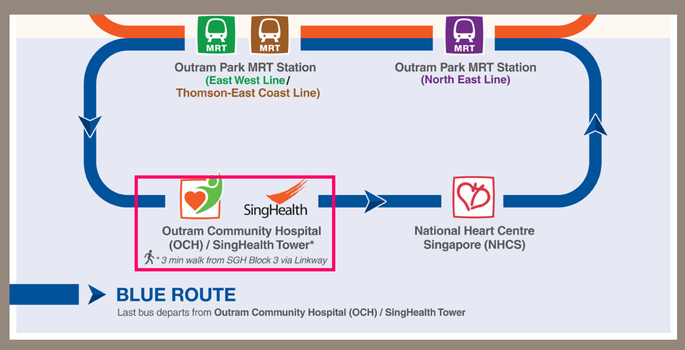


Figure 16: Energy reduction strategies towards SLE

Source: BCA SLE building tech roadmap

Operating Hours
Monday to Friday : 8.00am to 7.00pm
Saturdays and Eve of Public Holidays: 8.00am to 2.00pm
Sun & Public Holidays: No Service
Frequency: Approx. every 20 mins



Source: SGH Campus Shuttle Bus Services

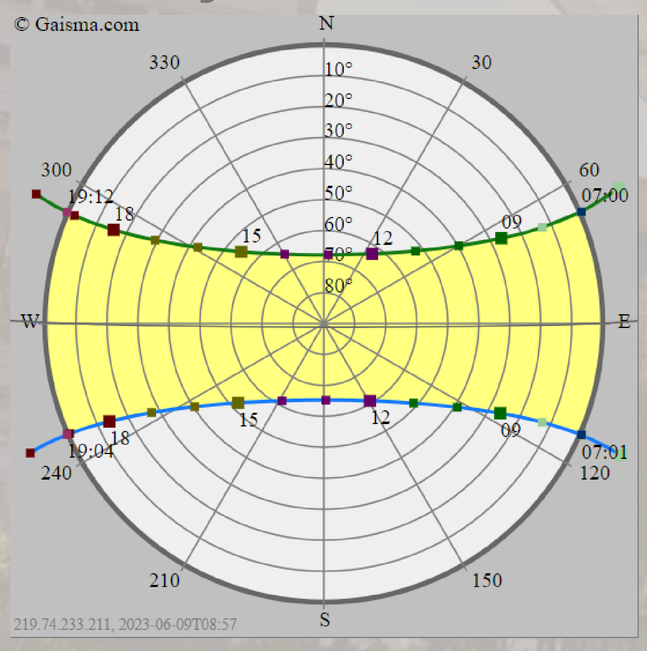
Considerations:

1. Based on environmental sustainability design strategies for buildings published by BCA, **passive strategies** have the **highest potential** for energy consumption reduction.

2. Shuttle services operates at a frequency of approximately every 20mins, classifying the space as **transient area**.

3. The application of solar film **reduces direct solar radiation and glare** from the sun. Subsequently, reducing the need for portable air coolers and fans to dissipate heat.

Analysis & Result



Source: Gaisma – Singapore's Sun Path Diagram

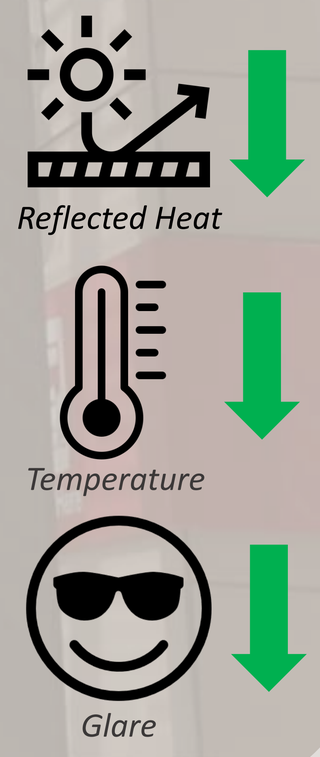
← ***Figure on Left***
Sun Path Diagram determines the direction of sun over the shuttle bus pick up point.

Film Specification	Film (Dark)
Visible Light Transmission	5%
Reflectance	18%
Solar Heat Gain Coefficient	0.36
Glare Reduction	80%
Infrared Heat Rejection	92%

Source: Supplier film specifications

- **Power consumption approx. 400W / Hour**
- **Operation hours based on shuttle services – 61hours per week**
- **Approximately 1,268kWh savings per year**

Typical Outdoor Air Cooler



Conclusion

In conclusion, the implementation of solar film emerges as a promising solution to address the thermal and visual discomfort faced by passengers at the SingHealth Tower shuttle bus pick-up point. By effectively reducing direct solar radiation and minimizing glare, the passengers experienced a more comfortable environment. Additionally, the use of solar films brings about the added benefit of eliminating electricity consumption at this location, contributing to energy conservation efforts. The application of outdoor air-coolers can be considered a contingency plan for extreme hot weather conditions. Overall, the use of solar film demonstrate a commitment to passenger comfort and sustainability in SingHealth Tower.