BCA Living Lab

Deployment of SinBerBEST Research Technologies at BCA ZEB^{PLUS} 1F

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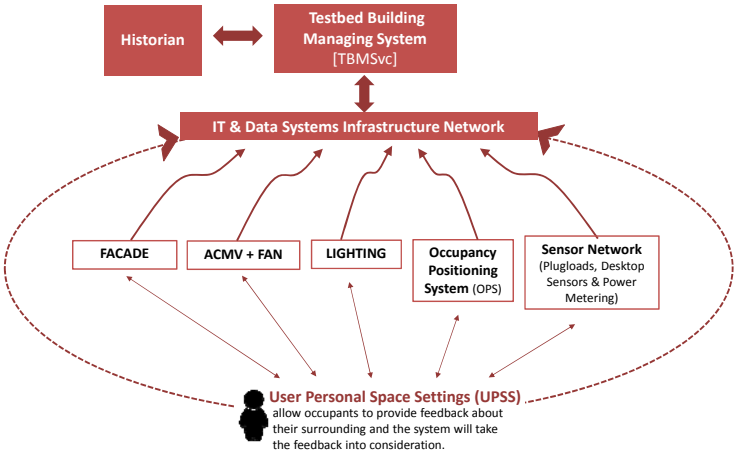
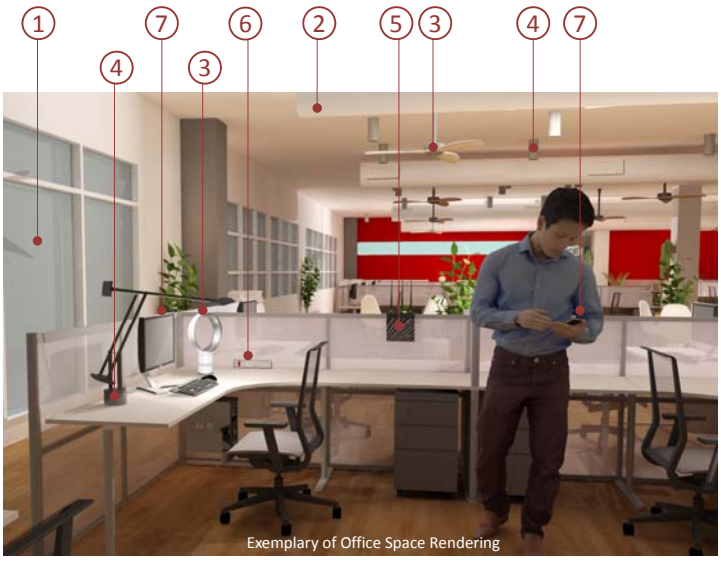
PROJECT DESCRIPTION

The goal of this project is to demonstrate the use of proven state-of-the-art SinBerBEST technologies (developed by BEARS, NUS and NTU researchers) in reducing the energy usage footprint in a typical office/living space scenario. Data will be harvested and used for further study and applications as well.



7 ENERGY EFFICIENT INNOVATIONS



Exemplary of Office Space Rendering

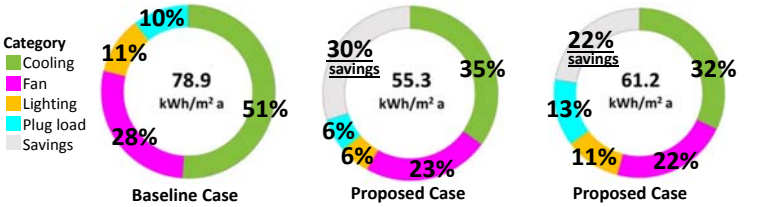
1 Energy Efficient Façade
The energy efficient façade with reflective coating can reduce heat penetration through the building envelope. Various types of such facades will be installed in ZEB to demonstrate their performance.

2 Demand Ventilation
A demand-controlled ventilation system operates accordingly to space needs, reducing average power consumption by 15 – 20% compared to traditional solutions. Moreover, indoor air quality performance-based approach guaranties employees a healthy work environment.

To demonstrate proven state-of-the-art SinBerBEST technologies, BEARS Limited has embarked on a "Living Lab" project to manage and control the existing premises occupied by current BCA ZEB 1F with deployment of various SinBerBEST related technologies related to *Lighting*, *Energy Metering and Sensor Network*, *Occupancy*, *Air-Conditioning Mechanical Ventilation & Fan System (ACMV+FAN)*, *Envelope*, *Information Technology (IT) infrastructure* and *User Personal Space Settings (UPSS) Application*. The estimated floor space of this deployment is ~740sqm with designated occupants about ~65 persons.

ENERGY SIMULATION COMPARISON

Preliminary energy simulation was carried out to predict potential energy saving forecasts (>20%) associated with the implementation of SinBerBEST technologies. SinBerBEST will further validate the simulation data in the course of the project engagement.



3 Smart Indoor Fans
When the room's air-conditioning temperature rises, the fan system kicks in to keep things cool and comfortable. It takes personal preferences of occupants into account to increase their satisfaction. The fan system includes both ceiling and personal desk fans.

4 Smart Lighting System
Powered via network cables (PoE) instead of conventional electrical power cables, this system gives users control over their preferred light settings. It ensures optimal brightness levels, switches off the lights automatically when there are no occupants, and harvests daylight to achieve energy savings of up to 30%. The smart lighting system includes ceiling lights and desk lamps.

5 Indoor Occupancy System
By tracking occupancy levels in the work space through WiFi-enabled mobile devices, the system manages energy consumption of the air-conditioning system, lighting system and electrical devices.

6 Intelligent Plug Load Management System
By monitoring individual occupant's plug load energy consumption, it promotes awareness and develops personal responsibility. In combination with the Occupancy system, it will automatically turn off electrical devices when human presence is not detected.

7 User Personal Space Settings (UPSS)
A personalized web interface allows every user access to information such as his/her energy consumption trends and environmental parameters (temperature, relative humidity, brightness). It is also a platform through which users can feedback their current thermal and visual comfort levels which will be used to adjust the air conditioning and lighting systems to better suit the occupants' needs.

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