

3 DIFFERENT ZONES

3 DIFFERENT EXPERIENCES

ZONE #1
VISITOR CENTRE

ZONE #2
THE SOLAR ENERGY
PANORAMA

ZONE #3
THE OFFICE OF THE
FUTURE



Welcome to the ZEB @ BCA Academy—the first Zero Energy Building (ZEB) in South-east Asia retrofitted from an existing building.

Converted from a three-storey former workshop, the ZEB @ BCA Academy houses offices, classrooms and a resource centre.

The ZEB @ BCA Academy is a zero energy building because the building produces enough energy to run itself. As a critical test-bedding facility, the 4,500 m² building aims to produce enough energy to power the building.

In all, the building will save S\$84,000* a year in energy cost compared to a typical office in Singapore.

The building aims to achieve this through a combination of **green building technology**, clever building design that takes advantage of natural ventilation and lighting (this is called '**passive design**'), and the harnessing of **solar energy**.

* based on an electricity tariff of 21.69 cents/kWh.

Why The ZEB @ BCA Academy?

The ZEB @ BCA Academy has a very important role to play in accelerating the greening of Singapore's built environment.

The building demonstrates how an existing building can be retrofitted with green building technologies to achieve energy efficiency and sustainability. The building is also a test-bedding centre for exciting new innovations in green building technology before they are promoted for adoption by the building industry.

Just imagine: The ZEB @ BCA Academy could be what the future looks like!

ZEB @ BCA ACADEMY

200 Braddell Road Singapore 579700

The tour for the ZEB is by appointment only.

For enquiries on guided group tours:

(65) 6248 9930 bca_gallery@bca.gov.sg

HOW TO GET THERE	FROM	BUS SERVICES:
	Bishan MRT Station	13
	Toa Payoh MRT Station	28, 73, 155, 159
	Toa Payoh Interchange	105, 153
	Braddell Road	93

www.bcaa.edu.sg/zero_energy_building.aspx

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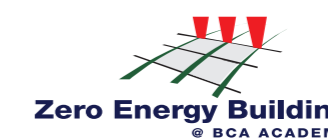


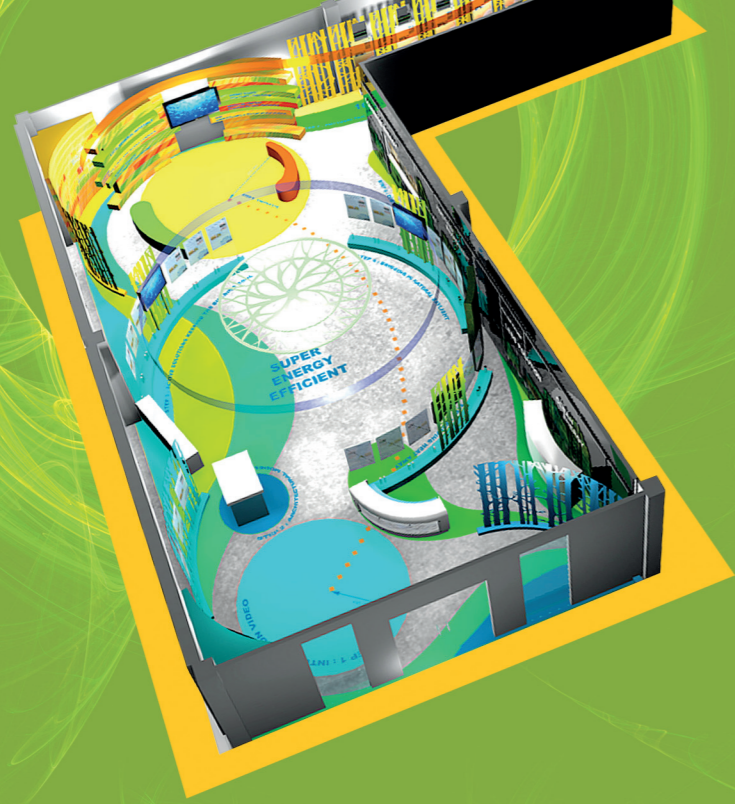
THE ISLAND'S FIRST RETROFITTED

ZEB ENERGY BUILDING



WELCOME TO A TOUR OF SINGAPORE'S GREENEST BUILDING





ZONE #1 VISITOR CENTRE

In this interactive zone, you'll get hands-on experience of the exciting building design strategies and technological innovation that make this zero energy building work.

Highlights in this zone:

- 1A Shading devices.** Discover how strategically placed shading contraptions can shield the building from the sun while bouncing natural lighting into the interiors of the building.
- 1B Living walls.** See how plants planted vertically on the walls of this building can shade the walls from the sun and lower indoor temperature.
- 1C Mirror ducts.** Try out this device made up of highly reflective mirrors to understand how it can bring sunlight indoors. Shine a light through the duct and you'll see light emerge through the duct's openings.

Other features:

- **Charge your phone using solar energy!** A charging kiosk will let you see exactly how energy generated from the building's solar cells is used to power devices in the building.
- **Smart building design.** You will be able to see how the building is designed—incorporating various green building technologies—makes it 40–50% more energy efficient than a conventional office building of a similar layout without the green building technologies.
- **Have the entire building at your command!** See the sophisticated Building Management System in action. This system automatically controls the various systems in the building to balance comfort and energy efficiency. Toggle the touch screen to see how much power is generated by the solar cells, how much electricity each room is using and more!



1A



1B



1C

ZONE #2 THE SOLAR ENERGY PANORAMA

Climb up to the viewing platform for a close-up look at the solar panels that power this building and other exciting solar installations.

Highlights in this zone:

- 2A Solar systems.** High performance solar panels are installed to supply energy for the building. Bigger than an Olympic-sized swimming pool when laid out side by side, these panels generate about 207,000 kWh of electricity a year. This is enough electricity in a year to power 45 four-room HDB flats. This energy is used to run the building's artificial lights, office equipment and air-conditioning.
- 2B Solar chimneys that suck warm air from a room.** Specially developed for the tropical climate, solar chimneys are made of metal that absorb solar radiation. Placed on top of the roof or up high in a non air-conditioned room, they suck out warm air from the room. Through convection, cool air will then rush into the room.
- 2C A daylight collector.** Light pipes set on top of the roof of the building collect sunrays and, through reflection via mirrors positioned in the ducts, throw this harvested daylight into the room below. This collected sunlight is spread evenly throughout the room by diffusers.
- 2D Rooftop garden.** With the rooftop garden shading the roof from the sun, the temperature on the top floor of the building can be reduced.



2A



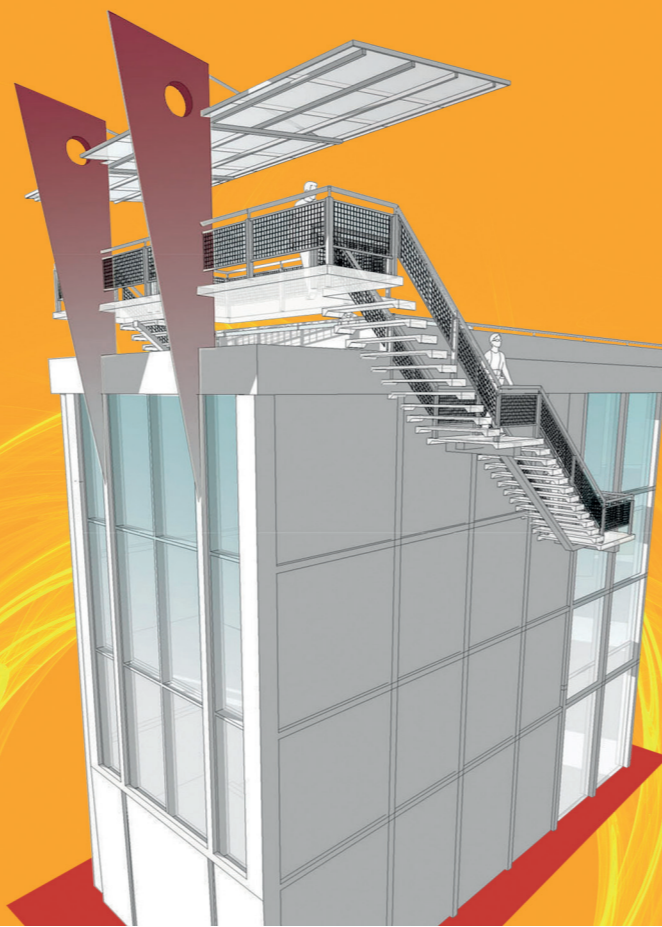
2B



2C



2D



ZONE #3 THE OFFICE OF THE FUTURE

In this actual working office, you will see many futuristic green innovations being tested out.

Highlights in this zone:

- 3A Personalised Ventilation.** Sit down at a desk in this futuristic office and you'll receive your own, personalised blast of fresh, cool air. This ventilation system delivers fresh air directly to each occupant through pipes attached to a desk.
- 3B Displacement Cooling.** Cool air is supplied from the floor level at low velocity. This cool air mixes with the warm air in the space and rises towards the ceiling where it is extracted. This approach requires less energy than a conventional air-conditioning system.
- 3C More natural lighting.** Light shelves positioned outside the windows of this office reflect sunlight deep into the room. This allows occupants to enjoy more natural lighting while cutting down energy consumed by artificial lighting.
- 3D Automatic light level adjustment.** Sensors in this office measure the light intensity within the office space. When light levels are sufficiently provided for by natural light, the artificial light is switched off.

Other features:

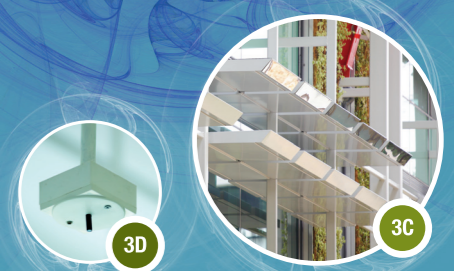
- **Single Coil Twin Fan Ventilation System.** This invention by the National University of Singapore, separately cools fresh air and recirculated air, resulting in efficient use of energy. The presence of occupants is detected by sensors and the cooling required is supplied accordingly.



3A



3B



3C



3D

