

ENERGY EFFICIENT: 51% Energy Savings from a combination of passive and active design



Passive Designs:

- Optimal orientation. Long façades facing North or South
- 2) Daylighting with lightshelves
- 3) Naturally ventilated corridors

Active Designs:

- 1) Energy efficient magnetic bearing chiller
- 2) Energy efficient VSD controls of pumps and fans
- 3) Energy efficient daylight responsive electric lighting
- 4) High temperature floor slab cooling
- 5) 3 different energy storage systems



ENERGY SYSTEMS

solar energy stored in thermal storage (150 kWh) or electric storage (384 kWh)



THERMAL ENERGY STORAGE

thermally stratified chilled water tanks



Insulated chilled water storage tanks (4 x 15,000 liters)



Tanks can be operated in parallel or in series

GRID INTERACTIVE BUILDING

optimised charging/discharging of energy storages to lower energy cost



Addressing the future of **BUILDINGS AS BATTERIES**

Research projects for optimised operation and grid-interaction to be conducted by university staff and students

KEY BUILDING DATA

areas, cost, energy and carbon



- Building name:
- Owner:
- Location:
- Building type:
- Total floor Area:
- Number of floors:
- Expected completion:
- Net BEI (Building Energy Index):
- ZEB (Zero Energy Building) category:
- CO₂e:

Sustainable Energy Living Lab UniKL UniKL-BMI, Batu 8, Jalan Sg. Pusu, Gombak, 53100 Selangor Academic Institution 2392 m² 3 storeys February 2023 -49 kWh/m²/year (Incl. PV) A Zero Energy Plus Building (106 MWh/year consumption vs. 220MWh/year production) Building is CO2 negative by 80 ton CO2/year (corresponding to removing 40 cars from the from road)

SOLAR PV INSTALLATIONS

UniKL Sustainable Energy Living Lab (First ZEB in Malaysia) Total PV Area: 1,100m2 PV System Capacity: 182 kWp (553 Modules)

PV System:

Grid Connected Solar PV (NEM) With Energy Storage System

Battery Energy Storage System: 384 kWh LifePO4 Batteries

PV Specific Yield: 1200 kWh/kWp/year

Simulated annual energy output: 220 MWh/year

Integration of PV Modules: Mullion-Transom Stick System & Rainscreen Cladding



PRINTED SOLAR PVOLAR PV INSTALLATIONS

1st in Malaysia



9 x 6 meter wall

Doubles up as University Logo and solar panel wall using the printed PV technology Artlite Active by AGC







UniKL Sustainable Energy Living Lab



ENERGY PLUS

UNIVERSITY SUSTAVASELE LANKELAB

UniKL Sustainable Energy Living Lab



ZERO Carbon Certification for the UniKL Sustainable Living Lab building



GreenPass Issued by SEDA, Malaysia

CarbonScore Issued by malaysiaGBC, Malaysia