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How it works

Two wind turbines on roof 20kw output each



"Robot valet" carparking in basement

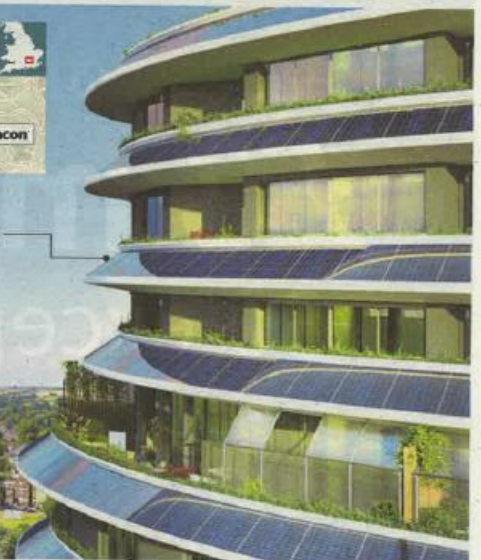
Ground source heat pump water pipes draw heat from the 17m foundations



Heat from shower water is captured and reused to reheat water



Solar panel ledge wraps around each level of the building to generate up to 800kw on 0.4 acres. The same output on the ground would require at least 4 acres



Tower block will be a green power beacon

Ben Webster Environment Editor

Imagine life without energy bills: not only saving money but avoiding all those hours trawling through comparison websites in search of the cheapest deal.

That is the promise of a new building that the developer claims will be the world's most sustainable residential tower. The Beacon in Hemel Hempstead, Hertfordshire, will provide "free energy for life" for the residents of its 272 flats in 17 storeys. They will save up to £1,134 a year on the cost of electricity and heating for a comparable modern home, Lumiere Developments said.

The tower will generate its own heat and power and need to draw on the grid only occasionally, with the cost of doing so covered by various renewable energy subsidies that it will earn.

Banks of solar panels will be installed on balconies on each floor. Lumiere says it will be the highest density solar farm ever, generating up to 800 kilowatts on 0.4 acres of land. A solar farm on the ground would need ten times as

much land to generate the same output. Two wind turbines on the roof will generate up to another 40 kilowatts.

Electricity consumption will be minimised by having LED lighting throughout, with motion sensors detecting when rooms are unoccupied and switching off lights.

Naturally occurring heat will be drawn from below the building via water pumped around a buried pipe. Heat from showers will also be recaptured from the water after it disappears down the plughole.

At the same time a pump will extract heat from an atrium occupying the core of the building while quadruple glazing will minimise heat loss.

The apartments, which range from £217,000 for a studio to £524,000 for three bedrooms, may not be entirely devoid of energy-hungry luxuries. The sales brochure says the premium apartments will have "terrace fittings for hot tubs".

The service charge will be £1,580 a year, which the developer said was well below the average for comparable new

The lowdown on high-rise living

Bosco Verticale, Milan
The name is Italian for "vertical forest". Two towers are covered with more than 700 trees and 90 species of plants, which helps to increase insulation, reduce overheating in summer, absorb rainwater and improve air quality.



turbines at the top and 24 "sky gardens" between two glass skins around the building.

Shanghai Tower At 2,070ft, the 128-storey tower has 200 wind

Strata, Elephant and Castle, south London
The 42-storey tower, left, has three huge wind turbines included at the top that are supposed to deliver 8 per cent of its electricity.

It won Building Design magazine's Carbuncle Cup "for services to greenwash" because the giant turbines rarely appear to turn.

apartments. The free energy will not, however, be unlimited but restricted to "fair use", meaning that residents could be charged for the excess if they used more than the average.

Ami Singh, commercial director of The Beacon, said it was essential to

charge for excessive use of energy to stop the system being abused. "It won't be enforced rigorously but the principle is to encourage people to consume only what they need," he said.

The limit will be set by the management committee but is expected to

about 10-20 per cent above average usage, as determined by Ofgem, the energy regulator, for the size of apartment and number of occupants.

Residents will be encouraged to use green transport, with a fleet of electric bikes and five electric cars, made by Tesla, Nissan and BMW, available to rent. They will, however, each have their own parking space in the underground car park, which has already prompted complaints from local people fearing increased congestion. Cars will be parked by a "robot valet" using an automated lift so there will be no emissions from the exhaust while residents search for a space in which to park.

However, Lloyd Alter, professor of sustainable design at Ryerson University in Toronto, said that many of the solar panels would be in shade much of the day, meaning that they could be simply a decoration. He advised residents to look closely at the terms and conditions of the free energy offer as the building appeared to lack sufficient cross-ventilation and they might need to use power-hungry air conditioning.



THE BEACON
EXEMPLAR LIVING



LUMIERE