

Case Study 5

Britain-London: ZED (Zero Emission District)

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Source: Other cities can learn from London's drive for clear air.

http://www.chinadaily.com.cn/business/2015-03/31/content_19958465.htm



CASE STUDIES

Case 4 Britain → London: ZED (Zero Emission District)

Problem to resolve: Global warming through CO2 emissions

Means: Transformation of solar energy gains, rainwater recycling, reduction of urban footprint



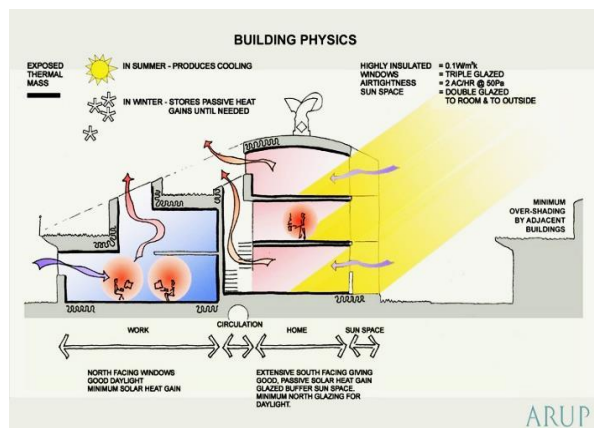
Secondary Tool: wind turbines on the roof, triple glazed, and have high thermal insulation, low-impact materials, solar panels, biomass heaters (downdraft gasifier)

Description:

Beddington Zero Energy Development (BedZED). The Beddington Zero Energy Development (BedZED) is an environmentally friendly housing development in Hackbridge, London, United Kingdom. Designed to create zero carbon emissions, it was the first large scale community to do so. ¹ BedZED was designed to be carbon neutral, protecting the environment and supporting a more sustainable lifestyle. The project was also pioneering by being the first construction project where a local authority sold land at below market value to make sustainable economically development viable.

Buildings. The 82 homes, and 1,405 square metres (15,120 sq ft) of work space were built in 2000–2002. The apartments are finished to a high standard to attract the urban professional, and the project was shortlisted for the Stirling Prize in 2003. Through integrated building design, the elements dedicated to energy production also perform other functions. For example, there are wind turbines on the roof that, besides producing energy are also used to promote ventilation and indoor-outdoor air exchange. The houses face south to take advantage of solar gain, insulation. Low-impact materials—Building materials were selected from renewable or recycled sources within 56 km of the site, to minimize the energy required for transportation.

Heating. The project is designed to use only energy from renewable sources generated on site. There are 777 sqm of solar panels. Tree waste fuels the development's cogeneration plant (downdraft gasifier) to provide district heating and electricity. The gasifier is not being used, because of technical implementation problems, though the technology has been and is being used successfully at other sites. **Biomass heaters** were implemented along with solar heating. The **pipes used for hot water distribution** pass near the win-



are triple glazed, and have high thermal insu-

Building Physics of Eco-District Bed-ZED, London

Source:

http://www.eurotubieuropa.it/english/NL/2014/09/nl_09_3.html

dows to maintain their heat even using the sun's rays.

Performance. Monitoring conducted in 2003 found that BedZED had achieved these reductions in comparison to UK averages:

- (i) space-heating requirements were 88% less;
- (ii) hot-water consumption was 57% less;
- (iii) the electrical power used, at 3 Kilowatt hours per person per day, was 25% less than the UK average; 11% of this was produced by solar panels. The remainder normally would be produced by a combined-heat-and-power plant fueled by wood chips, but the installation company's financial problems have delayed use of the plant;
- (iv) water consumption has been reduced by 50%, or 67% compared to a power-shower household, and
- (v) residents' car mileage is 65% less. A review of the BedZed development in 2010 drew mainly positive conclusions. Residents and neighbors were largely happy.

However, a few significant failures were highlighted, for example: (i) the biomass wood chip boiler (biomass gasifier) was no longer in operation and the back-up power source, a gas boiler, was now used. The downdraft wood chip gasifier CHP (combined heat and power) had reliability problems due to technical failures and the intermittent schedule of operation (no night time operation) imposed by the local authority; (ii) the 'Living Machine' water recycling facility had been unable to clean the water sufficiently. The cost of the facility also made it unviable; (iii) the passive heating from the sunspaces had been insufficient; and (iv) despite best efforts, residents were on average still leaving an ecological footprint of 1.7 planets, which is more than the target of 1.0 planet (but much less than the UK average of 3 planets).ⁱⁱ

BedZed: Energy-efficient Buildings



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BedZed: Energy-efficient Buildings



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BedZed: Energy-efficient Buildings



<http://www.energysavingsecrets.co.uk/bedzed-the-uks-biggest-eco-community.html>

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Further Reading:

ⁱ <http://en.wikipedia.org/wiki/BedZED>

ⁱⁱ <http://en.wikipedia.org/wiki/BedZED>, see also: Ryser, J. Ecocities in Action: Sustainable Development in Europe –Lessons for and from China? in: European Union, Konrad Adenauer Stiftung, et al. 2014. *Eco-Cities - Sharing European and Asian Best Practices and Experiences*. EU-Asia Dialogue. Singapore. pp. 107-123 <http://www.eu-asia.eu/publications/eco-cities/>