

# BedZED



Location of BedZED



**location:** Wallington, South London UK  
**dates:** planning begun 1999, completed 2002  
**type:** new construction on former brown field site  
**use:** residential, office/ workspace, open space  
**size:** 3.5 acres, 1.42 hectares  
**people:** 240 residents (100 units), 100 workers  
**actors:** Peabody Trust, Bill Dunster Architects, BioRegional Group, Ove Arup and Partners, Gardiner and Theobald  
**goals:**

- to create a 'net zero fossil energy development'
- 50% reduction in fossil fuel consumption by private car use
- locally sourced materials: 52% of constructions concrete, brick, and recycled steel from sources within 35 miles of site.

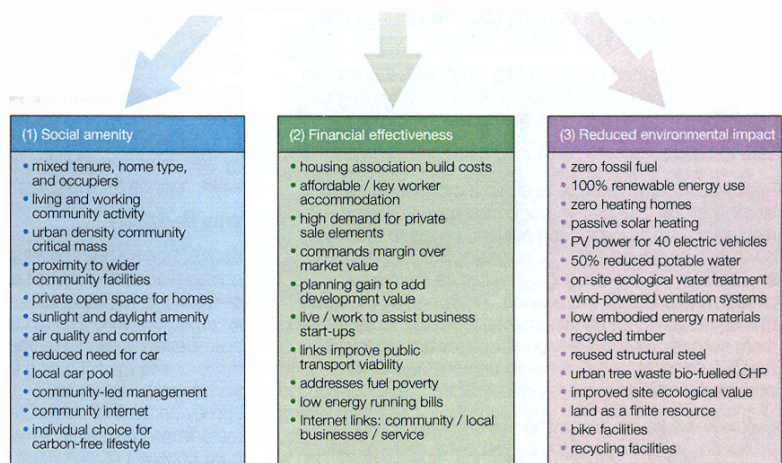
energy use		KWh/m <sup>2</sup>	construction	amenities
heating&electricity, goal		NA	super-insulated heavy masonry	community garden
heating&electricity,achieved		NA	triple- paned fenestration and skylights	local food production
heating&electricity,best		NA	recycled steel	community center
			83% construction timber FSC certified or reclaimed	athletic facility
systems			special projects	site ecology
district heating		x	car-sharing club	stormwater retention
combined heat & power		x	wood-waste powered CHP plant	green roofs
solar panels		x	'living machine' waste treatment system	permeable roads/sidewalks
solar cells		x		
biomass and refuse		x		
wind power				
natural ventilation		x		
heat recovery		x		
non-renewable energy		x		
individual metering				

### process and history

For this project, the building design, site planning, and larger systems designs were completely integrated such that the individual factors contributing to both the shaping and the outcomes of the development cannot be separated from one another. The site plan was carefully designed with the buildings such that density and lease able or sellable square footage was maximized; this is part of the underlying idea that the economic interests of developers are compatible with sustainable strategies of building as densely as possible, preventing further agricultural land or open space from being developed. The site was a brown field property close to existing commuter rail lines, and the architect stresses that all of the land that we need for housing as our populations grow can be had within already existing urban boundaries on derelict or overlooked sites. According to the architect's website, the development of BedZED in South London was a "3rd generation design developed over 5 years." BedZED was a prototype for all members of the team that led to its realization; the architect, the developers, and the consultants. Further improvements on this prototype are now being developed both together and independently among these groups based on the experiences learned here.



BedZED sustainability 'triple bottom line'.



## description of special project features

The distinctive form of the buildings is a direct result of this planning for density, combined with optimal solar exposure as well as daylight, fresh air, and private open space access for all units. The architect says that "it is hard to see how higher density urban infrastructure can be achieved without stealing a neighbouring plots' sunlight, or building rooms that can only be mechanically vented and artificially lit". Additionally, the use of all exterior building surfaces is maximized. Solar cells are integrated into the vertical south-facing facades, and also form a large installation on the south-facing portion of the roofs. Large protruding wind cowls, responsible for driving the fresh air and heat recovery systems, are interspersed with sedum roof beds that contribute to the handling of rainwater on site. The north-facing portion of the roofs sloped to allow the sun's rays on the shortest days of the year to reach the next row of buildings, contain a series of private terraced rooftop gardens with deep beds that can be planted for food growing. These gardens are separated by large skylights, triple-paned to provide high U-value, that allow daylight into the deeper portions of the units while separating the private terraces from one another and reinforcing privacy between units.

BedZED was developed by the Peabody Trust, a well-established social housing association committed to linking social housing aims with sustainable methods. A third of the housing was dedicated to low-income rental units, with shared ownership (rent-to-own) and outright ownership making up the other two thirds. Integration of work spaces into the project allow people to work closer to home, reducing the carbon emissions of transport while encouraging the development of a diverse neighbourhood and contributing daytime activity to the site. Demand for the units and the workspaces have been high, with all units sold and rented immediately and re-sale value greater than similar-sized properties in the same area by 15%. Residents attribute this popularity to the daylight and open space availability within the units.

## results

The strategy for reducing energy consumption at BedZED includes:

1. reducing or eliminating space heating demand by providing a super-tight insulated shell and passive solar design
2. providing power, heat, and hot water from a small, locally placed CHP plant which runs on the wood waste from a nearby municipality. Wood-powered plants are considered carbon-neutral because the amount of carbon released during combustion is equal to the amount that has been absorbed over a tree's lifetime, and thus no new carbon is being released into the atmosphere.
3. solar installations provide hot water and power for electric vehicles
4. low-energy lighting and energy efficient appliances are used.

Water saving fixtures combined with a local 'Living Machine' waste-water treatment system make up the strategy for water conservation.

Intentions aside, the wood-waste powered CHP unit, which is newer technology, has not been working properly and the community receives power from a traditional power network. Boilers were installed to respond to hot water needs of the residents. The waste treatment system is also out of service, due to problems securing an operator.

Even without the use of these systems, and with the goal of 'zero (fossil) energy' not being attained, BedZED has considerably reduced its carbon footprint. While energy consumption for space heating has not been monitored or recorded, "monitoring data on water and energy consumption demonstrated savings of over 30% on water use from water efficient appliances and fittings alone and approximately 90% on space heating" according to Jenny Organ at BioRegional. And according to an October 2002 bulletin from the architect's office, annual energy used for water heating is 43% less than that for similar typical UK residences, electricity consumption is 60% less, and water consumption is 56% less. One resident stated that "because the houses are well insulated and the wind-driven ventilation system so efficient, there is barely any need for heat."

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