

Beddington Zero Energy Development (BedZED)
 Bill Dunster, ZED Factory, Architect



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BedZED

BedZED is a mixed development urban village for The Peabody Trust. On a brownfield wasteland site in the London Borough of Sutton, the development provides 82 dwellings in a mixture of flats, maisonettes, and town houses, plus approximately 2,500 m² of workspace/office and community accommodation including a health centre, nursery, organic café/shop, and sports clubhouse.

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By Train:
 To: Hackbridge Station
 From: Victoria (every 30 - 40 mins)

The journey time from Victoria is 25 minutes. You can also take trains from Waterloo and change at Clapham Junction. Turn right out of the station car park—BedZED is about 8 minutes walk on the righthand side—distinctive wind cowls are visible on the roofs.

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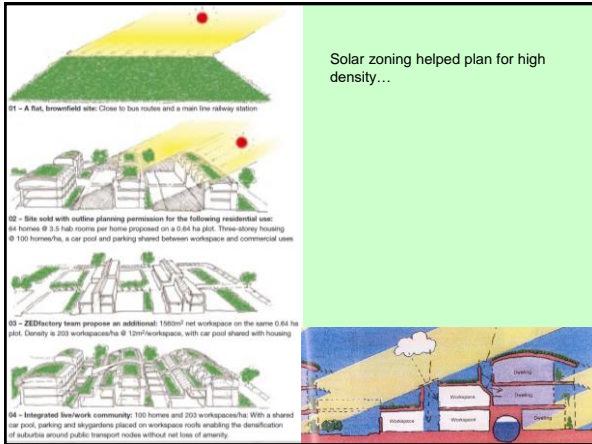
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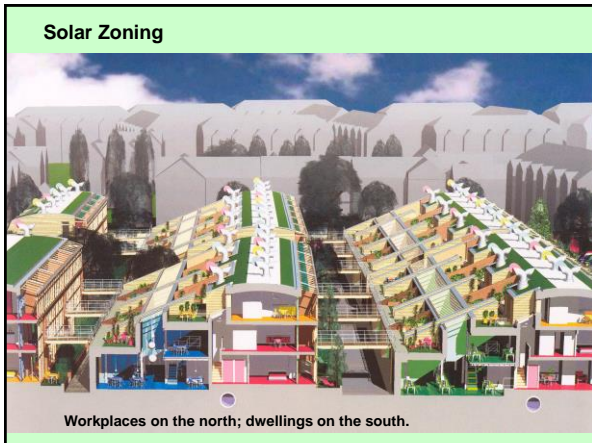


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Solar zoning helped plan for high density...

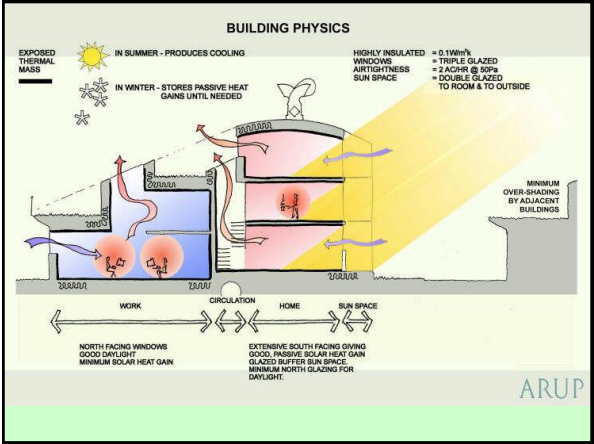
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Well-insulated and massive...

Element	Fabric U values		Proposed value for 2001	Proposed value for 2002	Bedzed value
	W/m ² /K (Btu/h/ft ² /°F)	Current value			
roof	0.25 (0.044)	0.2 (0.035)	0.16 (0.028)	0.1 (0.018)	
ground floor	0.45 (0.079)	0.3 (0.053)	0.25 (0.044)	0.1 (0.018)	
exposed floor	0.45 (0.079)	0.3 (0.053)	0.25 (0.044)	0.1 (0.018)	
exposed walls	0.45 (0.079)	0.35 (0.062)	0.3 (0.053)	0.11 (0.019)	
windows, doors and rooflights	3.3 (0.581)	2.2 (0.387)	2 (0.352)	1.2 (0.211)	

300 mm mineral wool insulation

Masonry walls and floors/ceilings

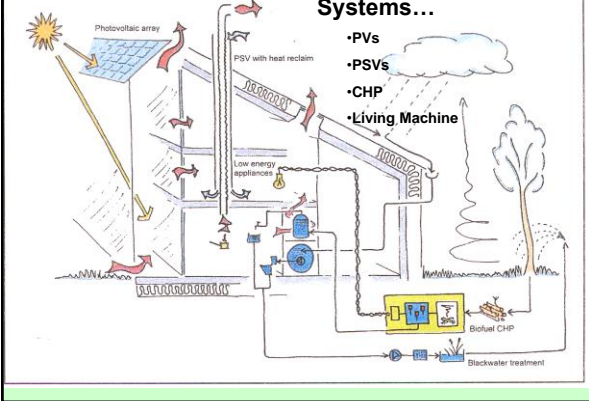
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Superinsulated roof gardens



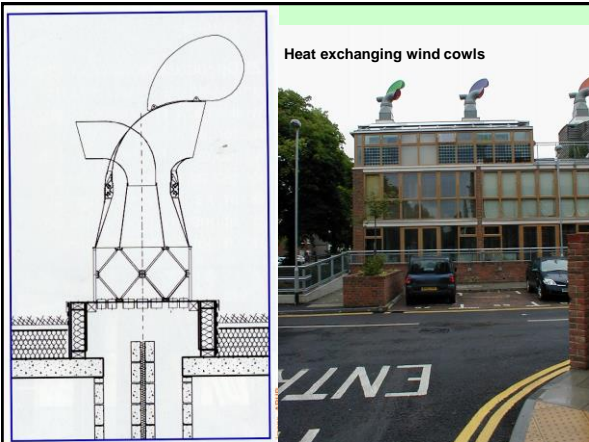
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Systems...



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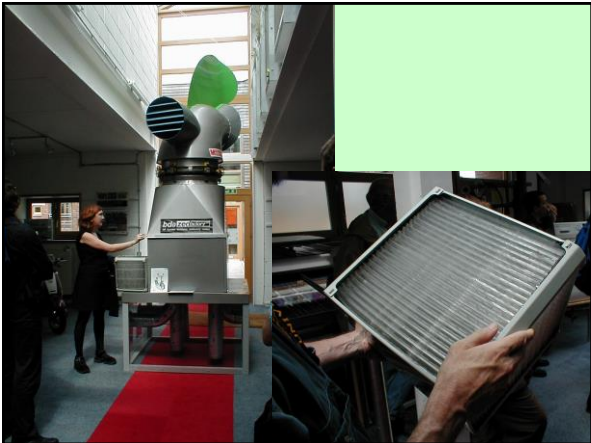
Heat exchanging wind cowls



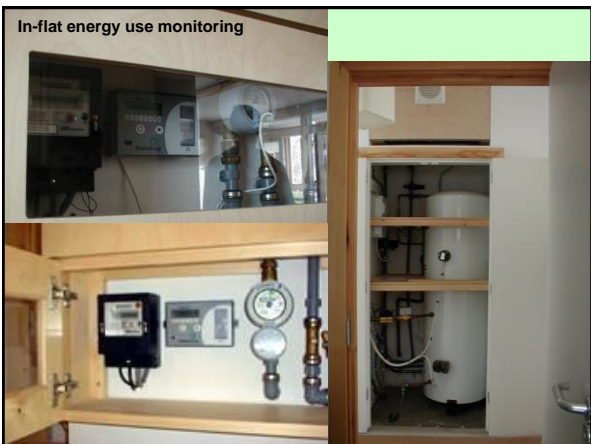
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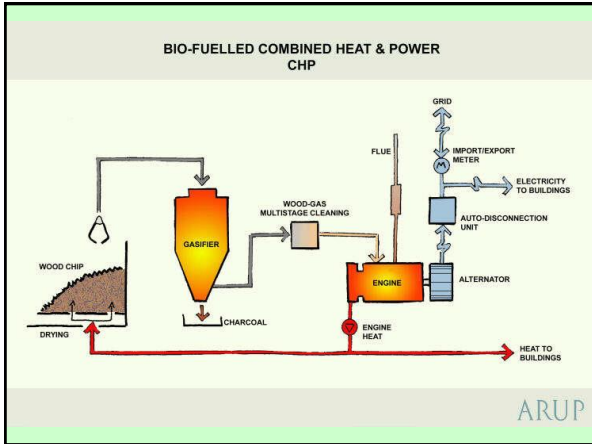
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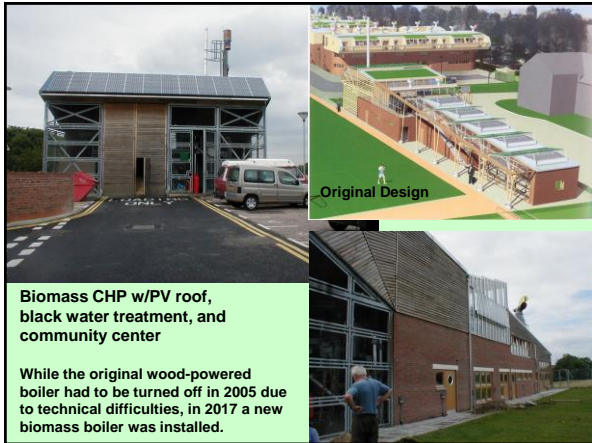
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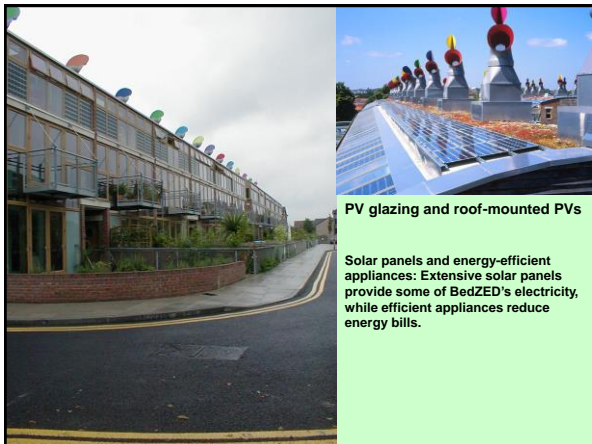
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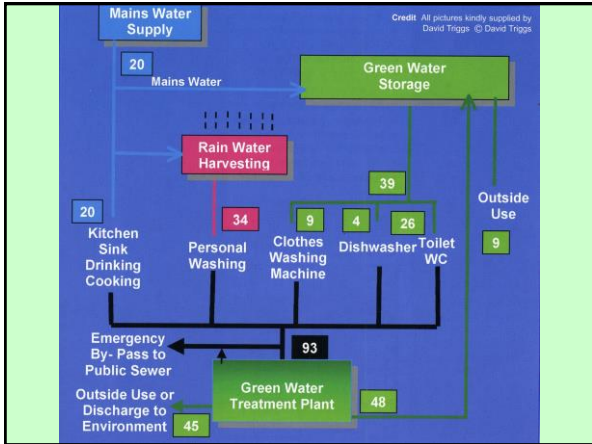
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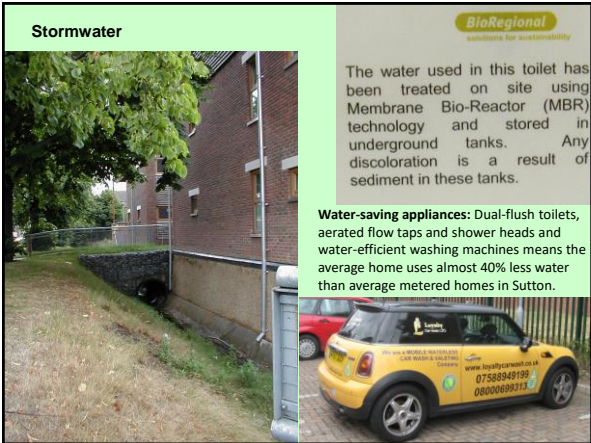


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Leach field/football pitch
 Even the land the eco-village stands on is recycled.
 It was used for many years for spreading sludge from the nearby sewage works.

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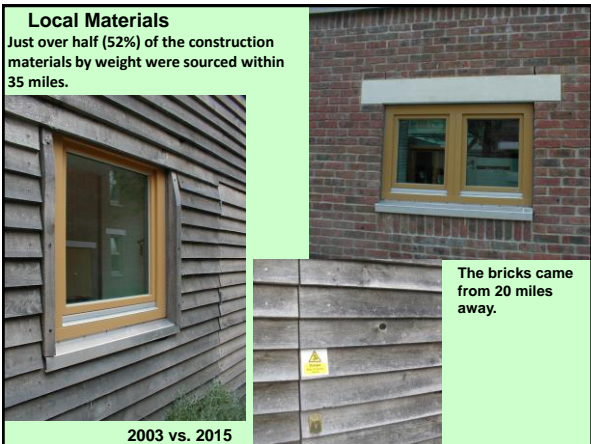


Stormwater

The water used in this toilet has been treated on site using Membrane Bio-Reactor (MBR) technology and stored in underground tanks. Any discoloration is a result of sediment in these tanks.

Water-saving appliances: Dual-flush toilets, aerated flow taps and shower heads and water-efficient washing machines means the average home uses almost 40% less water than average metered homes in Sutton.

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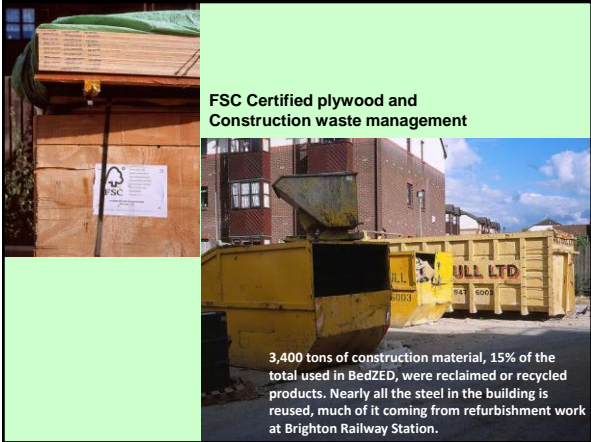
Local Materials

Just over half (52%) of the construction materials by weight were sourced within 35 miles.

The bricks came from 20 miles away.

2003 vs. 2015

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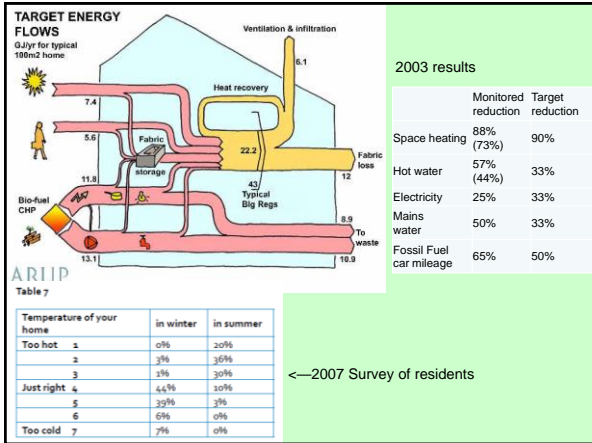
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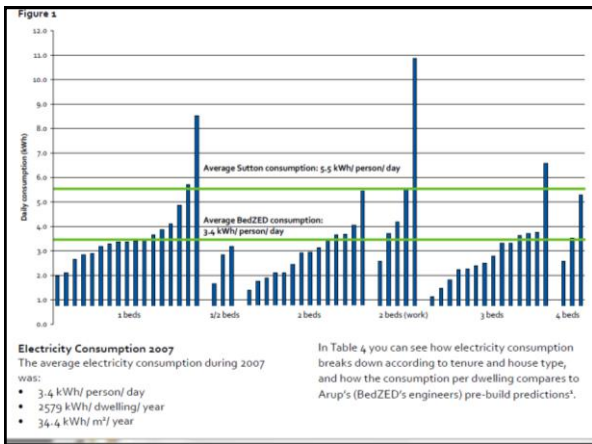
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Total energy consumption and CO₂ emissions/ m² (residential)


Table 6

		BedZED 2007 ^a	BedZED 2007 if CHP in operation ^b	UK Average (based on dwellings built in 2002)
Heating & hot water	kWh /m ² /yr	48.0	48.0	231.8
	CO ₂ /m ² /yr	9.3	1.2	45
Electrical load	kWh /m ² /yr	34.4	34.4	45.5
	CO ₂ /m ² /yr	10.6	-8.9	18.4
Total energy use	kWh/m ² /yr	82.4	82.4	275.3
	CO ₂ /m ² /yr	19.9	-7.7	63.3

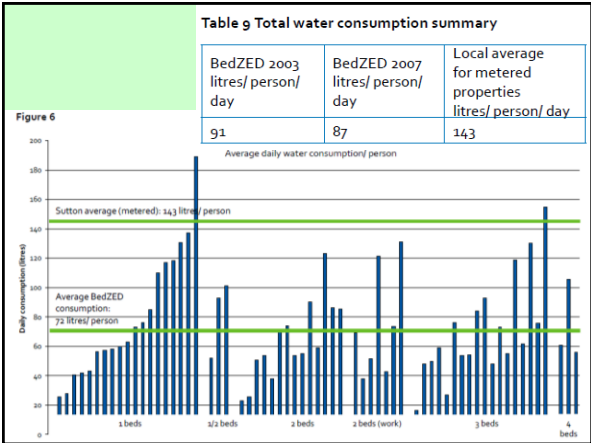
Table 8

	Electricity imported kWh	Electricity exported kWh	Net grid electricity consumed kWh
May-06	12,312.87	725.95	11,586.92
Jun-06	14,423.06	2,627.71	11,795.35
Jul-06	14,897.27	3,558.72	12,338.55
Aug-06	21,436.53	538.41	20,898.1
Sep-06	22,742.4	273.95	22,468.45
Oct-06	24,115.51	243.04	23,872.47
Nov-06	14,903.52	13.96	14,889.56
Total	114,831.14	6,979.74	117,851.4
12 month equivalent	249,662.38	13,959.48	235,702.8

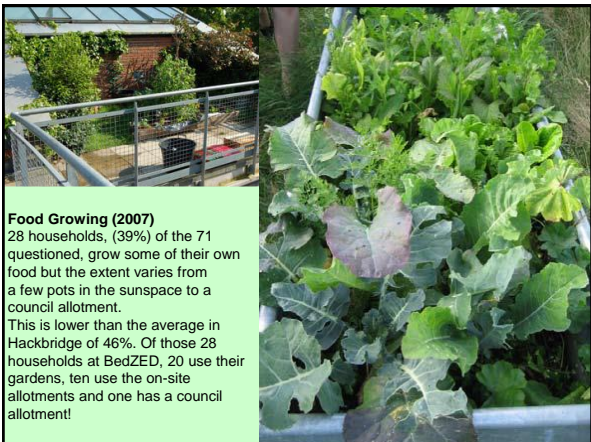
1.8.2 MSC Architecture: Advanced Environmental and Energy Studies Thesis, The BedZED lessons, Simon Corbey, December 2005



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The VegVan at Hackbridge Station supplements the on-site food supply.

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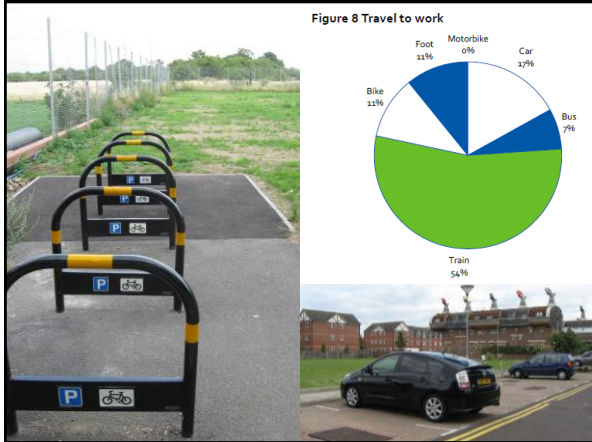
Solid Waste and Recycling

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Table 20

2007 Waste stream	Waste audits			Questionnaire	
	Kg/ household/ week	Kg/ person/ week	% composition (weight)	% composition (volume)	% households using the bin
mix dry (cans/ fabric/ plastic/ card/ paper)	2.4	1.2	30%		90%
green glass	1.0	0.7	12%		80%
brown glass	0.2	0.1	2%		72%
clear glass	0.4	0.2	5%		82%
white paper	0.0	0.0	0%		45%
Total recycling	4.0	2.2	50%	37%	90%
Compost	0.6	0.3	10%	7%	31%
Landfill	3.5	2.0	40%	56%	94%
Total	8.1	4.5	100%	100%	n/a

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Summary of likes
Most answers fell into the following categories (shown in order of frequency and number of interviewees who mentioned it):

- BedZED community (32)
- Architecture/ design (28)
- Sustainability (21)
- Wellbeing (feeling of space, light, quiet, health...) (19)
- Garden and sunspace (13)
- Cost (5)
- Location (5)
- Other (uniqueness, modernity...) (4)
- Facilities (community centre, car club, showers...) (3)
- Size (3)

Summary of dislikes
Most answers fell into the following categories (shown in order of frequency and number of interviewees who mentioned it):

- Location (15)
- Lack of wellbeing (temperature, noise...) (14)
- Things not working (CHP, hot water, repairs needed...) (13)
- Management (11)
- Size (9)
- Nothing (8)
- Crime/ fear of crime (7)
- Parking (6)
- BedZED community (5)
- Design (5)
- Intrusion from visitors (3)
- Sustainability (2)

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BedZED's performance 2015 - the facts and figures

BedZED's residents enjoy significant savings in their energy and water bills, and the development as a whole offers big reductions in carbon dioxide emissions compared to conventional UK housing.

Between 2012 and 2015, BedZED's annual gas consumption was 36% lower than a typical conventional development in Sutton, London of the same size and mix (100 homes plus office, college and community space).

Its annual electricity consumption during that period was 27% less. Consequently, we estimate that BedZED's greenhouse gas emissions (tonnes of carbon dioxide equivalent) from heating and electricity use were 32% less than from an equivalent conventional development during that four-year period.

53% reduction in travel carbon footprint
36% in gas consumption
32% in CO ₂ from home heating & electricity
27% in electricity consumption
23% in total carbon footprint

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