



Fuel type	Typical energy consumption kWh/m ² per annum		Floor area (GIA)	Typical annual energy consumption		Typical costs			Maximum difference £/y
	Low	High		Low kWh/y	High kWh/y	Cost p/kWh	Low £/y	High £/y	
Gas/biomass	90	170	10 000	900 000	1 700 000	0.04	36 000	68 000	
Electricity	50	125	10 000	500 000	1 250 000	0.07	35 000	87 500	
Total							71 000	155 500	84 500
Project cost: £20 million									
Potential energy cost variation: £84 000 per annum									
Percentage of project cost: 0.4%									

Project details



Passmores School Technology College in Harlow, Essex, is a £20 million, 10 000 m² school for 12 000 students. The lead consultant, architect Jestico + Whiles, has designed a naturally-ventilated two-storey building of concrete frame construction. Biomass boilers will provide the primary source of heating. The school is being procured through the SMARTE EAST contractor's framework by Essex County Council, and will be built by Willmott Dixon under a design and build contract. The services consulting engineer is AECOM and the mechanical and electrical contractor is LX Engineering. The project is scheduled to open in September 2011.

Energy calculation

Willmott Dixon carried out a sensitivity analysis on the potential variation in the school's energy use and energy costs. The analysis used data for best case and worst case predictions of the annual energy use of the biomass and gas heating systems and the school's electricity consumption. The predictions were taken from recent case studies of actual energy consumption in-use of some recently completed large secondary school and academy projects.

Using the academy studies as a basis for prediction, the school's heating energy demands were anticipated to be within 90-170 kWh/m² per annum, and the electricity use between 50 and 150 kWh/m² per annum. When applied to the Passmores School project floor area and anticipated energy cost data, this equates to a total potential energy cost variation between best and worst cases of around £84 000 per annum. This equates to 0.4% of the total contract capital cost budget.

Relevance to Soft Landings

The investment cost for Soft Landings, particularly the aftercare stages which require additional professional fees for fine tuning, energy monitoring and post-occupancy evaluation activities, is nominally placed at around 0.1% of total contract cost. This percentage will be proportionally lower for large projects, and higher for small projects. Clients require persuasion that the investment will be worthwhile.

The nominal 0.1% post-handover and aftercare costs of Soft Landings, spread over a three-year period, are very much smaller than the annual variation in operational energy. Soft Landings provides the means for any variations in operational performance and cost to be investigated and resolved during the early period of occupation. This is evidence that clients can't afford not to do Soft Landings, if they want design targets to stand a greater chance of being achieved in reality.

SOURCE MATERIAL

