



**Surrey's
Greener
Future**

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**Decarbonisation Case Study
Clifton Hill School**



Clifton Hill School



Decarbonisation through PSDS (Salix) Grant Funding and SCC Funding

Greener Futures 2030 Net Zero applied for Public Sector Decarbonisation Scheme funding in 2021 which included Clifton Hill School. The grant value obtained for this school was £176,252

The anticipated cost of the decarbonisation project at time of PSDS application was around £438,074 but this did not include electrical infrastructure upgrade requirements that may be required when decarbonising and switching from fossil fuel heating to an electric based system.

The objective is to reduce the carbon emission in the school, whilst seeing some running cost savings. Taking a whole building approach as required under the grant funding application rules the school would see improvements in the fabric of the building with insulation and the existing end of life boilers will be replaced with new air source heat pumps serving the space heating and hot water demand. The work also includes the associated civil, mechanical and electrical works, most of the existing electric convectors and water filled radiator systems will be removed and new radiators, fan coil units and distribution system installed. The incoming electrical supply will be upgraded to cover the heat pump electrical demand.

Updated BMS (building management system) to be installed to control heating and increase efficiency.

In addition – Solar PV Installed

65 PV panels will be installed across the pitched roofs of the school to provide cheaper rates of electricity to the school to provide further running cost savings and SCC would benefit through the creation of a PPA agreement with the school which would generate income over the 25 years of the PPA agreement.



Clifton Hill School



Premise	Address	Premise Type	Floor area (m ²)
Clifton Hill School	Chaldon Road, Caterham, CR3 5PN Chaldon Road, Caterham, CR3 5PN	School	1,445



Clifton Hill is a special school for children and young people with severe and profound multiple learning difficulties. The original school building was constructed in approximately 1960 and extended in 1997. The school teaching areas were extended in 2012 by the construction of a classroom block with three classrooms, group room, office, teaching kitchen and WCs. A hydrotherapy unit was constructed in 2001 and comprises a swimming pool with hoists and four changing rooms. The swimming pool and the hub teaching block are not part of this scope.

Site building services include heating and domestic hot water, the heating for area 1 is provided by 2no. gas fired condensing boilers. The domestic hot water is provided via gas fired cylinders. The second plantroom for area 2 provides heating via 2no. gas fired boilers and domestic hot water via a gas fired cylinder. The heating systems deliver the heat via wet radiators and convection fan emitters throughout the site. In site surveys it was found that most of the existing heat emitters are not suitable for delivering peak heat loads at standard low temperatures of heat pumps (40-50°C).

Energy Consumption Pre Decarbonisation

Energy Type	Consumption (kWh/Yr)	Energy Cost (£/Yr)	CO2 Emission (tonnes/Yr)
Electricity	106,601	£28,878	27
Gas	390,434	£20,537	72
Oil	0	£0	0
Total	497,035	£49,415	99





Clifton Hill School

ECM: Solar Photovoltaic

A total of 63 PV panels, each size 385W, will be installed on roof of the school.



ECM: Insulation Improvement

Loft insulation to a total of 300mm thickness.



Clifton Hill School

Following successful grant fund award the project was fully scoped and costed as shown

Contractor Costs including DNO Total = £917,947

Heat pump	£639,892
Insulation	£14,950
Solar	£104,000
Electrical upgrade costs	£159,105 est
Atkins project management cost	£59,610 est

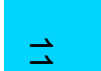
Project cost	£917,947
Salix grant funding	£176,252
FM replacement heating cost	£175,000
Solar generation PPA income*	£245,673
Greener Futures overall cost	£321,022

SCC Borrowing Cost, 25 yr = £395,000

*Total SCC Income from PPA (25 yrs)

DNO = Distribution network operator





Clifton Hill School



Savings for School

Heating annual savings	-£2,052
Annual savings from insulation	£1,326
Solar generation annual income from PPA	£2,050
Annual fuel savings for School total	£1,324

(kWh unit price dependent, based on current CCS)

Savings are expected to increase significantly as utility costs change

Expected Lifetime Carbon Savings = 740 tCO_e



The pie chart below show the percentage of kWh savings for each energy saving measure (ECM.)



Clifton Hill School



Decarbonisation Summary

Following the decarbonisation the school will have a new heating system ready to last the next 25 – 50 years

New CO₂ Air Source Heat Pumps are UK manufactured using natural CO₂ refrigerants. SCC have maintained the strictest use of low global warming potential gasses in their heat pumps futureproofing this heat source.

Savings from removing a gas system are likely to see increasingly higher savings if gas and electricity prices follow prediction. Combined (School and SCC) annual savings are £11,000 per year.

SCC are exploring new ways to increase the solar capacity on schools to increase electricity production which could see payback times reduced with new PPA's.

With decarbonisation and electrification long term electric prices will remain more competitive than gas.

Decarbonised SCC schools are being prepared for increased electrification with upgraded supplies to allow for electric vehicle charging capacity.



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