

Energy Audit

Building: Ballyphehane Community Centre
Address: Tory top Road , Ballyphehane
Completed By: S. McGovern
Date : 01.09.2021



**CORK ENERGY
CONSULTANCY**

The building in question, Ballyphehane community centre was originally constructed in 1972 adjoining the Tory top park in the heart of the Cork City Suburb of Ballyphehane. The original building provided a community sports hall built of solid wall construction with a metal clad roof with a number of roof lights , this part of the building which has high usage today is heated by 6 large gas radiant heaters which are in bad repair and over 30 years old approx. The buildings surrounding the hall to the East and South were constructed with cavity wall construction. This section received pumped cavity wall insulation in the form of EPS bead in recent times. The entire attic of this section is completely uninsulated. It is worth noting that when insulating this section care will be needed to ensure no air layer is created between heated space and insulation layer . This part of the building has a number of uses, a large section is given over the HSE which runs day care faculties for the elderly , a meals on wheels service is also run from the easterly section. This section is heated by radiators and large gas fired boilers approx. 16 years old. There are 2 hot water cylinders that appear to be connected to this boiler. A 400 litter tank with no insulation located on the far north side of the site and a small 120 litre cylinder factory insulated in a room next to this plant room. The small cylinder although insulated is also peeling and in bad repair. Domestic water for this area is supplied by a new condensing combi boiler. There is a lot of wasted energy here resulting form the over sizing an under insulating of the 2 buffer tanks. Most of the windows in this section as with the rest of the a building are modern uPVC units. However some of the smaller windows of small or irregular size are still single glazed steel framed. There are number of timber doors also in this area, they are visibly mis fitted and allowing a lot of uncontrollable air ingress.

To the left side of the site, a large 2 story extension was construction in 2009 of cavity wall construction and metal clad insulated panelled roof. The ground floor is used mainly as dressing room and changing faculty for the local soccer club and sports hall. Showers are all instantaneous electric units. This section appears to be very under utilised. Upstairs is a working gym again with changing facilitates on 1st floor.

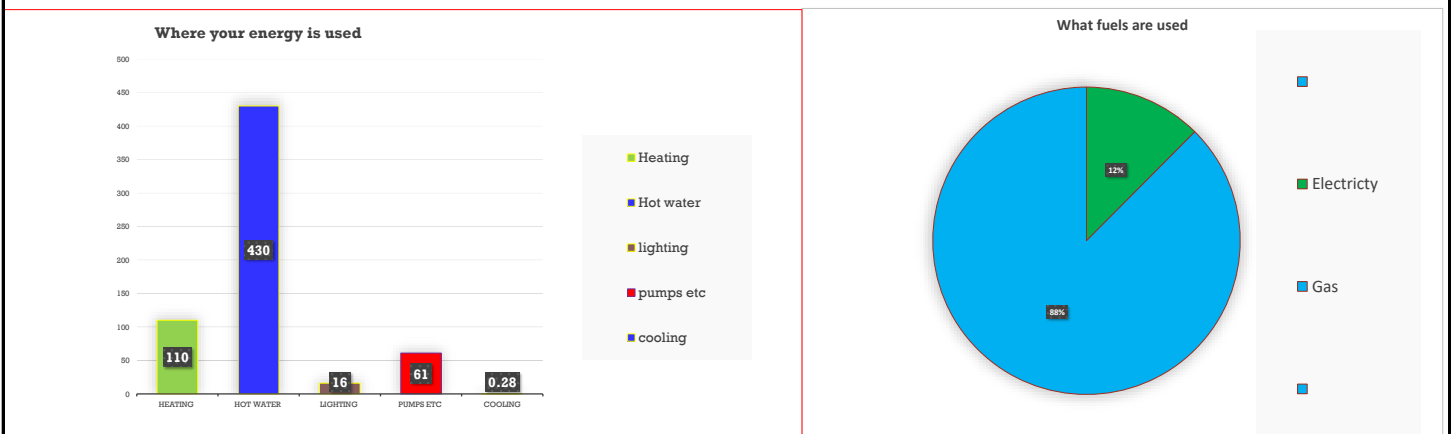
As mentioned above some works have been undertaking already this year on site , this includes full LED lighting retrofit and all the 1972 wall that contain cavities have received injected EPS bead insulation.



Baseline Energy Performance

Baseline Energy Performance		Energy consumption	Heat &Cool	Electricity	Notes
Total Floor Area (m2):	1774	Usage (kWh/yr.)	195637	899187	Electricity and Oil usage taken from NEAP model
Energy Rating:	B3/786	Cost per unit (€/kWh)	0.09	0.170	Bill data was supplied
Year of construction:	1972	Energy cost (€/yr.)	17607	152862	
Building Volume	6741	Total cost		€170,469 Euro	Actual Bill data ratio 0.16

Present Energy Usage in graphical view



Outline of proposed energy upgrades

Insulate all attic spaces with 400mm horizontal insulation, Rolled /pumped special care should be taken to ensure no air movement of air under insulation is possible.
 Replace roof on Hall with metal clad sheeting ,
 Externally insulate solid wall of hall gable,
 Replace all door and single glazed windows,
 Air tightness audit fixing any obvious issues,
 Replace electrical heating in Hall with air to Air Heat pump,
 Install 50 kWp PV solar array.

Consider removing large uninsulated copper cylinder located in store room, consider consolidating both systems in one new buffer tank located in the plant room on north east corner of building.

Roof

Building Fabric

Heat loss element	Description	Net Area (m2)	U-Value Before (W/m2K)	Recommended Upgrade	U-Value After (W/m2K)	Capital Cost (€)	Electrical Savings (kWh/yr.)	Thermal Savings (kWh/yr.)	Saving (€)	Payback (years)	Primary Energy Saving (kWh/yr.)
Walls	Solid concrete	165	2.10	150mm EPS EWI	0.27	€ 29,700		7500	€ 1,350	22	7500
Roof	Metal cladding	495	5.10	150mm Reinsulated metal clad panels	0.20	€ 59,400		105056	€ 18,910	3	105056
Roof	no insulation	700	2.00	300mm fibre insulation rolled	0.13	€ 12,600		67377	€ 12,128	1	67377
Doors		20	3.00	Insulated doors	1.20	€ 7,000		1970	€ 355	20	1970
Windows	SG Metal	10	5.20	Double glazed U Value 1.4	1.40	€ 3,500		1000	€ 180	19	1000

Ventilation

Heat loss element	Description	Unit	Before ac/hr	Recommended Upgrade	After (ac/hr)	Capital Cost (€)	Electrical Savings (kWh/yr.)	Thermal Savings (kWh/yr.)	Saving (€)	Payback (years)	Primary Energy Saving (kWh/yr.)
Ventilation	Building leakage at roof and windows /doors.	Wl/sec	25.00	Include airtightness upgrade	0.15	€ 1,016		180	€ 32		180
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Notes:

Heating System

System	Description	Performance	Before	Recommended Upgrade	After	Capital Cost (€)	Electrical Savings (kWh/yr.)	Thermal Savings (kWh/yr.)	Saving (€)	Payback (years)	Primary Energy Saving (kWh/yr.)
Heating System	Gas fired hall heaters	Efficiency	50%	Switch to air to air in hall	450%	€ 40,000		25350	€3,549	11	25350
		Fuel	50%		420%	€ -		0	€0	0	0

Renewable energy generation

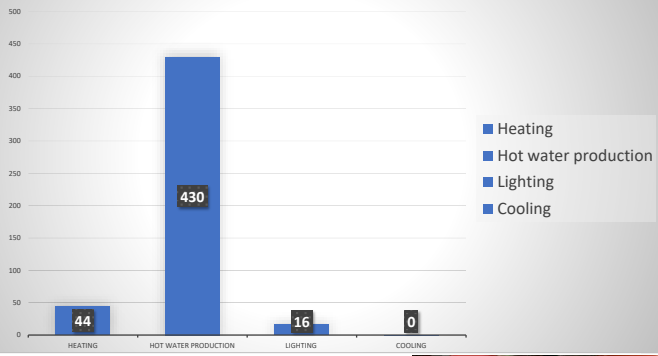
Systems	Description	Size (kWp)	Location	Capital Cost (€)	Electrical Savings (kWh/yr.)	Thermal Savings (kWh/yr.)	Saving (€)	Payback (years)	Primary Energy Saving (kWh/yr.)
	Install PV ands Battery	50	South facing roof	€ 125,000	50000	0	€ 5,400	23	125000

Post Retrofit Energy Performance

Total Floor Area:	1774 m2	Energy Rating:	B2/582	Energy consumption Usage (kWh/yr.)	821362	Heating	255474	Other	0.090	Notes	As per NEAP modelling
Total energy credits (kWh/yr.)	333,433	Total energy cost (€/yr.)	€ 73,923	Cost per unit (€/kWh)	€ 0.19	Energy cost (€/yr.)	€ 48,540	Saving			
Total Capital Cost Estimate:	€ 278,216	Adjusted saving based on previous usage	122,462.59	Payback Period Estimate:	6	Bills V model =0.1	€7,862				

Notes : Disparity between bill data provided and modelled energy usage is likely down to under-usage. The model is assuming quite a lot of energy usage associated with hot water production for use in showers but in practise they are not used due to underusage of the building.

Where is energy used, post works



Post works What Fuels are used ?

