

Introduction

This appendix compare the 3 options for the space heating to the Sports Hall and makes recommendations on the most cost effective solutions.

Options

Unit Heaters

Unit heaters mounted at high level c/w speed control to the space. Heaters are served in the LPHW heating installation.

Capital Cost:	£ 12,791.00
Fuel Source:	Natural Gas
Seasonal Efficiency:	90%
Fuel Unit Cost:	Natural Gas – As per Radiant Panels Electric - £ 0.11/ kWh
Estimated Running Cost p.a:	£ 2,838.00 p.a Natural Gas £ 162.00 p.a Electricity

Total: £ 3,000.00 p.a

Radiant Panels

High level radiant panels in conjunction with natural ventilation.

Capital Cost:	£ 49,152.00
Fuel Source:	Natural Gas
Seasonal Efficiency:	90%
Fuel Unit Cost:	£ 0.05912 - First 2000 kWh per quarter £ 0.03935 - remainder per quarter

Estimated Running Cost p.a: **£ 1,605.00 p.a**

Gas Radiant Panels

Capital Cost:	€ 34,419.00
Fuel Source:	Natural Gas
Seasonal Efficiency:	90%
Fuel Unit Cost:	As per radiant panels
Estimated Running Cost p.a:	£ 1,605.00 p.a

Comparison – 25 year Life Cycle

Option	Fuel	Capital Cost	Running Cost Energy	Life Maintenance Cost	Total Life Cost
Unit Heater	Natural Gas	£12,791.00	£3,000.00	£700.00	£74,397.00
Radiant Panel	Natural gas	£49,152.00	£1605.00	-	£70,225.00
Natural Gas Radiant Panel	Natural Gas	£34,419.00	£1605.00	£1,700.00	£96,076.00

Notes:

1. Unit heater life assessed at 15 years.
2. Radiant panels life 25 years.
3. Radiant Tube life 15 years.
4. Radiant Tubes require servicing/ commissioning every year estimated at £ 1,700.00 p.a.
5. Life maintenance costs allow for annual maintenance and replacement during 25 year life cycle.
6. A discount factor of 4% was used throughout.

Conclusion

Radiant Panels (LPHW) are recommended as they provide the lowest total life cost.

Year	Unit Heaters					LPHW Radiant Panels					Nat Gas Radiant Tube Heaters				
	Capital Costs (£)	Energy Costs (£)	Repair Costs (£)	Annual Costs (£)	Total (£)	Capital Costs (£)	Energy Costs (£)	Repair Costs (£)	Annual Costs (£)	Total (£)	Capital Costs (£)	Energy Costs (£)	Repair Costs (£)	Annual Costs (£)	Total (£)
1	12,791	2,723	-	673	16,187	45,152	1,543	-	-	46,695	34,419	1,543	-	1,635	37,597
2	-	2,618	-	647	3,266	-	1,484	-	-	1,484	-	1,484	-	1,572	3,056
3	-	2,518	-	622	3,140	-	1,427	-	-	1,427	-	1,427	-	1,511	2,938
4	-	2,421	-	598	3,019	-	1,372	-	-	1,372	-	1,372	-	1,453	2,825
5	-	2,328	-	575	2,903	-	1,319	-	-	1,319	-	1,319	-	1,397	2,716
6	-	2,238	-	553	2,791	-	1,268	-	-	1,268	-	1,268	-	1,344	2,612
7	-	2,152	-	532	2,684	-	1,220	-	-	1,220	-	1,220	-	1,292	2,512
8	-	2,069	-	511	2,581	-	1,173	-	-	1,173	-	1,173	-	1,242	2,415
9	-	1,990	-	492	2,482	-	1,128	-	-	1,128	-	1,128	-	1,194	2,322
10	-	1,913	-	473	2,386	-	1,084	-	-	1,084	-	1,084	-	1,148	2,233
11	-	1,840	-	455	2,294	-	1,043	-	-	1,043	-	1,043	-	1,104	2,147
12	-	1,769	-	437	2,206	-	1,002	-	-	1,002	-	1,002	-	1,062	2,064
13	-	1,701	-	420	2,121	-	964	-	-	964	-	964	-	1,021	1,985
14	-	1,635	-	404	2,040	-	927	-	-	927	-	927	-	982	1,909
15	-	1,573	7102	389	9,064	-	891	-	-	891	-	891	11,661	944	13,496
16	-	1,512	-	374	1,886	-	857	-	-	857	-	857	-	908	1,765
17	-	1,454	-	359	1,813	-	824	-	-	824	-	824	-	873	1,697
18	-	1,398	-	346	1,743	-	792	-	-	792	-	792	-	839	1,631
19	-	1,344	-	332	1,676	-	762	-	-	762	-	762	-	807	1,569
20	-	1,292	-	319	1,612	-	733	-	-	733	-	733	-	776	1,508
21	-	1,243	-	307	1,550	-	704	-	-	704	-	704	-	746	1,450
22	-	1,195	-	295	1,490	-	677	-	-	677	-	677	-	717	1,395
23	-	1,149	-	284	1,433	-	651	-	-	651	-	651	-	690	1,341
24	-	1,105	-	273	1,378	-	626	-	-	626	-	626	-	663	1,289
25	-	1,062	-	263	1,325	-	602	-	-	602	-	602	-	638	1,240
Total	12,791	44,242	7102	10262	74,397	45,152	25,073	0	0	70,225	34,419	25,073	11,661	24,923	96,076