

Appendix 1 PSDS Phase 3C Works

Meeting	Cabinet
Date	22 nd January 2024
Item No. & Title	Council Building Decarbonisation Programme - PSDS Phase 3C Works

1. Financial Implications

- 1.1 There are financial implications to be considered as part of the proposed decarbonisation works, these are a mix of one-off capital project costs, implications on the Council's future energy costs and risks associated with grant clawback. This appendix details the financial implications associated with the key aspects of the Council's proposed decarbonisation works relating to the installation of air source heating and energy efficiency measures.

Decarbonisation Works to Operational Buildings

Capital Costs

- 1.2 It is proposed that the following energy efficiency works are carried out to eight of the Council's operational buildings, to reduce their carbon impact:

Energy Efficiency Projects:

Building	Description of Work	Project Cost	Annual kWh Savings	% kWh Savings	Carbon Savings (tonnes/Year)	Annual Financial Impact
Kimberworth Place	Loft insulation	£507,509	11,378	4%	2.1	£621
	External wall insulation		20,518	7%	3.7	£1,121
	Heating - zone control valves		18,541	6%	3.4	£980
	Hot water - efficient taps		17,510	7%	3.2	£956
	LED		10,120	6%	2.1	£1,525
	Lighting controls		2,805	2%	0.6	£423
	Solar PV		25,161	15%	5.2	£3,791
Matrix Dinnington Business Centre	BEMS	£285,777	29,297	20%	4.5	£2,591
	Heating - zone control valves		15,637	8%	2.9	£854
	LED - new fitting		8,692	8%	2.0	£1,310
	Solar PV		69,261	67%	14.0	£10,435
	Meters - heat		5,418	0%	1.0	£816
Swinton Civic Hall	Double glazing	£71,765	2,004	3%	0.4	£110
	Cavity wall insulation		6,189	9%	1.1	£338
	BEMS		4,582	10%	0.9	£375
	HW taps		447	2%	0.0	£67
	LED		2,092	8%	0.1	£315
	Lighting controls		891	3%	0.2	£134
	Solar PV		10,678	41%	2.2	£1,609
Oaks Lane	Double glazing	£60,133	1,189	2%	0.2	£65
	Loft insulation		7,629	13%	1.4	£417
	BEMS		3,172	10%	0.6	£229
	HW showers*		354	-9%	0.0	-£116
	HW taps		1,422	3%	0.3	£78

	Lighting controls		506	4%	0.1	£76
	Solar PV		10,111	87%	2.1	£1,523
Boston Castle	Double glazing	£41,304	922	6%	0.2	£50
	Roof insulation		719	5%	0.1	£39
	BEMS		1,084	10%	0.2	£89
	LED		1,102	18%	0.2	£166
	Solar PV		2,283	37%	0.5	£344
Hellaby - Denby	BEMS	£94,342	6,157	10%	2.0	£569
	HW showers*		826	-1%	0.0	-£272
	HW taps		641	1%	0.1	£35
	LED		238	0%	0.0	£36
	Lighting controls		5,401	11%	0.5	£814
	Solar PV		30,717	63%	6.0	£4,628
Hellaby - Sandbeck	BEMS	£158,201	20,254	10%	3.4	£1,484
	HW taps		10,359	3%	1.9	£566
	Lighting controls		12,190	15%	3.0	£1,837
	Solar PV		59,884	76%	12.0	£9,022
Century Business Centre	LED lighting	£424,344	18,870	19%	0.9	£2,843
	Solar PV		48,369	12%	2.3	£7,287
	BEMS		51,079	15%	6.0	£7,696
TOTAL		1,643,375	556,699		93.5	67,874

***The work to convert to electric showers is estimated to have a small negative cost impact.**

Heating Decarbonisation Works:

Building	Description of Work	Project Cost	Annual kWh Savings	% kWh Savings	Carbon Savings (tonnes/Year)	Annual Financial Impact
Kimberworth Place	Replace current fossil fuel system with ASH to provide a combined heating and DHW system	£638,006	173,344	45%	30.6	£5,000
	Electrical works to incoming supply and distribution					
Matrix Dinnington Business Centre	Replace current fossil fuel heating system with ASH to provide heating	£270,038	106,187	42%	18.0	£2,727
	Replace current fossil fuel DHW system with electric point of use heaters.*		9,720	2%	2.0	-£75
	Electrical works to incoming supply and distribution					
Swinton Civic Hall	Replace current fossil fuel heating system with ASH to provide heating	£207,251	35,505	34%	6.2	£1,126
	Replace existing central immersion heater with an electric point of use heater.		1,141	4%	0.2	£178
	Electrical works to incoming supply and distribution					
Oaks Lane	Replace current fossil fuel heating system with ASH to provide heating	£125,394	32,322	26%	5.7	£1,456
	Replace current fossil fuel DHW system with electric point of use heaters.*		-664	16%	-0.2	-£261
	Replace gas radiant heater with an electric radiant strip panel.*		-5,304	0%	-1.1	-£827
	Electrical works to incoming supply and distribution					

Boston Castle	Replace current fossil fuel heating system with ASH to provide heating	£145,722	8371	27%	1.4	£197
	Replace current fossil fuel DHW system with electric point of use heaters.*		-1286	-29%	-0.3	-£281
Hellaby - Denby	Replace current fossil fuel heating system with ASH to provide heating	£137,357	48,641	56%	8.0	£1,543
	Replace current fossil fuel DHW system with electric point of use heaters.		4,290	5%	1.0	£142
	Electrical works to incoming supply and distribution					
Hellaby - Sandbeck	Replace Ambi-Rad heaters with LTHW radiant panels fed by ASHP	£763,444	92,495	-13%	23.6	£1,579
	Replacing gas boiler with ASHP		75,370	-11%	18.5	£1,659
	Electrical works to incoming supply and distribution					
Century Business Centre	Replace current fossil fuel system with ASH to provide a combined heating and DHW system	£789,000	384,954	80%	94.3	£11,704
TOTAL		3,076,212	965,086		208.0	25,866

The electrical system upgrade cost at Century hasn't been included due to the complexity and extent of the work involved to remove the individual supply meters to each unit and upgrade the existing supply point to increase capacity for the heat pumps.

***The work to convert to electric heaters is estimated to have a small negative cost impact.**

1.3 The capital costs of the energy efficiency works, such as LED's and solar panels are broken down per operational building below. The total estimated cost of these is £1,643,375.

Building	Energy Efficiency Works
Kimberworth Place	£507,509
Matrix Dinnington Business Centre	£285,777
Swinton Civic Hall	£71,765
Oaks Lane	£60,133
Boston Castle	£41,304
Hellaby - Denby	£94,342
Hellaby - Sandbeck	£158,201
Century 1 Business Centre	£424,344
Total	£1,643,375

1.4 The capital costs of upgrading the Council buildings to enable air source heating to be installed are shown below. The total estimated cost is £3,076,212.

Building Name	Description of Work	Total Project Cost (£)
Kimberworth Place	Replace current fossil fuel system with ASH to provide a combined heating and DHW system	£638,006
Century 1 Business Centre		£789,000
Total		£1,427,006
Matrix Dinnington Business Centre	Replace current fossil fuel heating system with ASH to provide heating	£258,384
Swinton Civic Hall		£200,665
Oaks Lane		£98,228
Boston Castle		£141,511
Hellaby - Denby		£125,164
Hellaby – Sandbeck		£235,301
Total		£1,059,253

Matrix Dinnington Business Centre		£11,654
Oaks Lane	Replace current fossil fuel DHW system with electric point of use heaters.	£8,168
Boston Castle		£4,211
Hellaby - Denby		£12,193
Total		£36,226
Swinton Civic Hall	Replace existing central immersion heater with an electric point of use heater.	£6,586
Oaks Lane	Replace gas radiant heater with an electric radiant strip panel.	£18,998
Hellaby - Sandbeck	Replace Ambi-Rad heaters with LTHW radiant panels fed by ASHP	£528,143
Total		£553,727
Low Carbon Heating Total		£3,076,212

- 1.5 The works expected to cost approximately £4.7m in total will be funded from a combination of PSDS grant of £1,566,752 and a Council contribution of £3,152,833. The Council contribution will come from Capital funding for the operational building decarbonisation programme (total Capital budget of £6.4m). From the £6.4m, £1m has already been allocated as part of the Council Building Decarbonisation Programme submitted to Cabinet in September 2023. All costs for works are estimated and subject to procurement. As such there is an element of risk in the cost estimates, especially given the current impact of inflation remains a challenge. However, the Council's decarbonisation programme of £6.4m is available to support potential increased costs following the procurement process should it be required. The grant application does include a capital contingency of £313k (7%), however, it is prudent to increase this to 15% given the current inflationary challenges in the market to be funded from the Council's decarbonisation programme. The table below summarises the projected capital costs.

Application	Total Grant Requested	Council Match Contribution	Technology Breakdown		Total Project Cost
Century 1	£576,848	£636,496	Energy Efficiency	£424,344	£1,213,344
			Low Carbon Heating	£789,000	
Kimberworth, Matrix, Swinton Civic ,	£989,904	£2,516,337	Energy Efficiency	£1,219,030	£3,506,241

Oaks Lane, Boston Castle, Hellaby			Low Carbon Heating	£2,287,211	
Project Construction Contingency – increase to 15%		£313,000			£313,000
Total Grant	£1,566,752				£5,032,585
Total Council Match		£3,465,833			
Project Cost	£5,032,585				

Revenue implications

- 1.6 It is estimated that the proposed smaller energy efficiency projects will generate a cost reduction for the Council of £68k per year, whilst the larger heat decarbonisation works are estimated to generate a further £26k saving per year. These savings are due to reduced usage of gas and electricity. Therefore, reducing the Council's overall utility costs at these buildings.
- 1.7 A vital part of the financial implications of the current proposal is estimating the revenue implications that the Council will see should it move from the current gas boilers to Air Source Heating at these premises. This presents a challenge as future projections for gas prices have always been difficult and even more so given the recent global conditions that have distinctly impacted gas prices.
- 1.8 In order to support the decision-making process, the table below provides a simple comparator of the current financial impact of converting from fossil fuel heating (heating and water) to low carbon / electric alternatives based on current rates and projected rates at the time when the proposed Air Source Heating / point of source water heating would be operational.

Figures based on proposed 8 Council Buildings	22/23 Gas Heating Costs	Projected Gas Heating 23/24	Projected Gas Heating 24/25	Projected Gas Heating 25/26	Air Source Heating estimated costs 25/26
Annual cost of energy usage	£209,389	£182,410	£88,437	£86,299	£60,487
Service & maintenance Costs	£6,900	£7,590	£8,349	£9,184	£8,319
Total cost	£216,289	£190,000	£96,786	£95,483	£68,806

Movement from projected 25/26 Gas Heating					-£26,677
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1.9 Based on these projections for Gas and ASH rates and the current demand levels the annual impact of a movement to ASH would be a decrease in revenue cost of £27k per year. The below table compares the estimated 10-year cost position between Gas Boilers and a potential Air Source Heat Pump. It should be noted that these are volatile markets and as such these are estimated only and officers will need to keep a close watch on the market as proposed capital works progress.

Site	Energy Cost (£) Total for 10-year period	
	ASHP	Gas Boiler
Century Business Centre	£210,662	£295,465
Kimberworth Place	£100,517	£134,698
Matrix Dinnington Business Centre	£81,697	£94,295
Swinton Civic Hall	£18,449	£26,965
Oaks Lane	£32,513	£25,508
Boston Castle	£10,155	£7,271
Hellaby Depot	£158,315	£180,410
Maintenance	£132,579	£146,369
Total	£744,888	£910,981

This table doesn't include any additional savings that will be gained from the reduced consumption from energy efficiency projects.

- 1.10 Installation of air source heating will significantly reduce the carbon emissions from buildings, with an estimated annual direct reduction of 208 tonnes CO₂ per annum from low carbon heating systems. A total of 301 tonnes CO₂ per annum is expected when including additional energy efficiency measures. Reduction will increase further in the future when low carbon electricity sources are developed and used by the Council and Government plans to decarbonise with the grid (2023 grid electricity is 207g CO₂ per kWh) are achieved. All installed gas boilers are reaching the end of their life and will need to be replaced/upgraded within the next few years at an estimated cost of £270k.
- 1.11 Further reductions in consumption, estimated at ~8% would be delivered through the implementation of the additional efficiency measures as part of the PSDS capital project, excluding photovoltaic installation work. It is essential that the fabric of these buildings is improved where possible to ensure that heat losses are significantly reduced, resulting in cost, and carbon, savings for the Council. This reduction has not been included in the above revenue estimates because it cannot be estimated until design. This reduction would not be expected for the 'as is' gas boiler option as the PSDS funding cannot be accessed for gas heated systems (unless the Council decided to use its own funding for this work).
- 1.12 The cost projections are estimates, the Council is unable to control how costs may increase year on year regarding gas and electricity prices. The forecasted energy prices are based on predicted Cornwall Insight (energy consultancy) energy prices.