

Decarbonisation of council buildings

To: Environment and Green Investment Committee

Meeting Date: 13 July 2023

From: Executive Director of Place and Sustainability

Electoral division(s): all

Key decision: Yes

Forward Plan ref: 2023/061

Outcome: The intended outcome is to enable funding of energy efficiency and on-site renewable energy generation as part of the investment in the low carbon heating programme for the Council's buildings.

Recommendation: Committee is asked to recommend:

To approve the revised investment criteria for the Decarbonisation Fund to include energy efficiency measures, solar PV installations and undertaking whole building retrofit works as set out in Option 1 in paragraph 2.16.

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1. Background

- 1.1 The Council's annual carbon footprint report shows that heating of buildings with oil and gas accounts for the majority of the Council's direct carbon footprint. These are known as Scope 1 emissions and are those that the Council has the greatest control over.
- 1.2 In February 2020, the Council included a £16million Environment Fund in its budget plan to support delivery of its commitments set out in the Climate Change and Environment Strategy. £15million of the fund was earmarked to replace oil and gas heating with renewable heating. There were approximately 70 buildings owned and occupied by the Council (as well as 114 maintained schools) that used fossil fuel heating systems at that time.
- 1.3 In June 2020, the Environment and Sustainability Committee agreed the assessment criteria for a Low Carbon Heating Programme for the Council's buildings against which individual projects can draw down investment from the Environment Fund for their implementation. The approved criteria for investment included:
 - Individual sites are owned (either freehold or long term leaseholds) and occupied by the Council, and not planned to be sold or let out within the next five years (based on currently known and agreed plans);
 - The proposed design meets the Council's renewable heating specification;
 - The Programme is expected to achieve a simple average payback of 20 years or better for the £15million investment, taking into account the value of carbon. (Individual projects may exceed this as long as the average is maintained);
 - If any individual project is greater than £500,000, the project will come forward to Committee for approval.
- 1.4 In July 2021, the Environment & Green Investment Committee agreed a similar funding package for a programme of Low Carbon Heating projects on maintained schools. The arrangements and funding criteria for the schools programme is slightly different. Further details are given in Appendix B.
- 1.5 The most suitable technologies for heating buildings from renewable sources are Air Source Heat Pumps (ASHPs) and Ground Source Heat Pumps (GSHPs). In ASHPs, outside air is used to heat a liquid refrigerant. The pump uses electricity to compress the refrigerant to increase its temperature then condenses it back to release stored heat. This heat is then used to heat water which is then piped to either radiators or under-floor heating. ASHPs still work well even when the outside air temperature is very low. GSHPs work in a similar way, except that coils or pipes containing refrigerant are buried in the ground. Note that whilst heat pumps do use electricity, they are very different to traditional electric heating, in that the electricity is not the source of heat. Heat pumps typically deliver a heat output around 3 times as much as the electricity they use. GSHPs are considerably more expensive than ASHPs.
- 1.6 The government's Public Sector Decarbonisation Scheme (PSDS), administered by Salix Finance, offers grant funding to local authorities for heating decarbonisation projects. The PSDS grant application window usually opens once a year in Autumn and winning this

funding helps extend the number of projects that the Environment Fund can support. The Council has been successful in securing around £3.9m of PSDS grant funding to date, towards the cost of its low carbon heating programme for its own buildings. (Separately, £3.6m of further grants have also been awarded for schools projects.)

PSDS grant window	Council Buildings	Maintained Schools
Phase 1	£3,049k	-
Phase 2	-	£229k
Phase 3a	-	£991k
Phase 3b	£804k	£2.3 million
TOTAL grants awarded	£3.8 million	£3.6 million

- 1.7 The intended outcome of this report is to update the assessment criteria for the council's low carbon heating programme for the Council's buildings, against which individual projects can draw down investment from the Environment Fund for their implementation and thus enable the Council to proceed with further significant work to improve energy efficiency and renewable electricity generation across its buildings. By reducing the Council's and Cambridgeshire's carbon footprint, this will have wide reaching benefits to our residents and local communities.

2. Main Issues

- 2.1 Twenty-two projects were brought into the Council's programme under phases 1 and 2 of the programme, between 2020-21 and 2022-23. All 22 sites have had ASHPs installed. Some sites have also required upgrades to the incoming electricity supply. These 22 projects between them are expected to save around 357 tonnes of carbon emissions per year and reduce the Council's gas use by about one third.
- 2.2 The total capital cost of these first 22 projects is forecast to be around £5.2m. This is funded through a combination of grants (approx. £3m) and Environment Fund (Decarbonisation Fund for CCC Buildings) which is funded through borrowing. The majority of these projects are now complete.
- 2.3 Projects at five further sites are also now underway, having been awarded a further £804k in PSDS grants towards the costs of these projects. The total project costs are estimated at £1.5m for these five sites. The work for these five projects will be mostly completed in 2023-24 and is being managed by the Property Team.
- 2.4 The Property team are also undertaking another project, working with the SEND team, at the Hawthorns site in Cambridge to convert the building into a residential home and intensive therapeutic support hub for children. The capital cost for that project is approved by Strategy and Resources Committee, and design work is now underway. Funding of £372k from the Decarbonisation Fund towards this project has been agreed to upgrade the

design to a low carbon heating system.

- 2.5 As part of the Council's Climate Change and Environment Programme (formerly the Enabling Net Zero Programme), two consultants were appointed to produce Heat Decarbonisation Plans (HDPs) for 40 more CCC sites. These HDPs provide the information to assess the high-level feasibility and likely costs of installing low carbon heating and other energy efficiency and electricity generation measures at more sites in future.
- 2.6 A Low Carbon Skills Fund (LCSF) grant application was made in April 2023 for ~£358k for the costs of consultancy to complete detailed design works for low carbon heating systems at 12 further sites. The outcome is expected to be known at the end of June. If successful, this grant would cover the costs of design work and consultancy only, and a further application to the PSDS grant can be made in Autumn for funds towards the capital costs of installation. These sites, if found to be technically feasible, could form the next phase of the low carbon heating programme in 2024-25. Further projects will then be brought forward each year thereafter, until the Environment Fund is fully utilised or all sites are decarbonised.
- 2.7 In total, across all 28 confirmed projects on Council buildings to date, total project costs are forecast at £7.78m, of which £3.91m (~50%) will be grant funded. In addition, schools projects have drawn down £748k of Decarbonisation Fund to date, and the current projection is that Phase 3b school projects will draw down a further £1.64m in 24/25
- 2.8 Actual and forecast expenditure to date across the programme is as follows:

Financial Years	Decarbonisation Fund expenditure - Council buildings (including grant funded)	Decarbonisation Fund expenditure – Schools (grants not included as these go straight to the school)	Total
2020-21 to 2022-23 actual	£4,994k	£467k	£5,461k
2023-24 forecast	£2,385k	£281k	£2,666k
2024-25 forecast	£ TBC	£1,640k	£1,640k
Total committed expenditure	£7,379k (£3,848k from grants and £3,531k from borrowing)	£2,388k	£9,767k

- 2.9 Separately, £3,499k borrowing from the Decarbonisation Fund was transferred to the Education Capital team to support the move to Nearly Zero Energy Buildings for new build schools. This was agreed by Full Council in February 2022 as part of the Business Plan.

- 2.10 Whilst the first grants received were used to reduce the amount obtained from borrowing, later grants were used to increase the programme of works whilst keeping the level of borrowing the same. Altogether, this means there is currently approximately £3m left in the Decarbonisation Fund that is not yet allocated and available for more projects. As at March 2023 there were still 31 Council buildings heated by gas and 2 using oil, that do not already have a project in progress.
- 2.11 The overall programme across all Council sites is still within the agreed payback criteria. The portfolio payback is currently estimated at 6 years (including the value of carbon savings, and based on the differential costs compared to replacing like for like with fossil fuel heating). If the value of carbon was not considered then the payback would be 24 years. This is based on actual gas and electricity prices for 2020 to 2023, and forecast prices from ESPO for 2024 and from the Treasury Green Book for 2025 onwards. The payback period is dependent on the relative prices of gas and electricity. Please see Appendix A for a full list of sites, costs and carbon savings.
- 2.12 Installing ASHPs does mean that electricity use will increase. Whilst electricity is regarded as net zero carbon (as long as the Council continues to purchase a 100% renewable electricity tariff), it does mean increases to revenue costs in electricity bills (although government have committed in their Powering Up Britain report from March 2023 to rebalance the costs of gas and electricity pricing by the end of 2024, as a price signal to shift both households and businesses to lower carbon solutions such as heat pumps). In some cases the increased electricity costs are offset by no longer having gas bills, but this does vary from site to site, and depends on the relative costs of gas and electricity.
- 2.13 In all cases it is beneficial to reduce electricity bills through energy efficiency measures (such as LED lighting, improved insulation, controls) and/or on-site electricity generation (such as rooftop solar PV). These measures are also often recommended in the Heat Decarbonisation Plans. Inclusion of LED lighting and solar PV also help demonstrate that we are taking a 'whole building approach', as required by Salix for PSDS grants, thus increasing our chances of securing further grants in future. In addition, the solar PV and LED lighting elements greatly improve the business cases, and often will tip the energy bill impact into a net saving. Without these, some projects would become unviable.
- 2.14 The funding for the implementation of the Heat Decarbonisation Plans will come through a combination of further applications to PSDS grants and remaining Decarbonisation Fund for the Council buildings low carbon heating programme until this Fund runs out, which is currently forecast to be in 2025-26. The challenge is how to fund the wider energy efficiency and solar PV measures that are also recommended as part of building retrofits.
- 2.15 In some cases, solar PV (and other measures) can pay back through electricity bills savings. Paybacks of around 10 years are typical for solar PV although this varies from site to site. Insulation usually has longer paybacks. Below are two ideas for consideration on how to fund the additional measures.
- 2.16 Option 1: Extend the investment criteria on the current decarbonisation of heating for Council buildings accessing the Decarbonisation Fund, to include energy efficiency measures and solar PV or even whole building retrofit. The suggested wording of revised criteria for this option, which would apply only to the Council buildings decarbonisation programme (not schools), would be as follows:

The council's Decarbonisation Fund may make a contribution to funding of individual projects, provided that they meet the following criteria:

- The site(s) are owned (either freehold or long term leaseholds) and occupied by the Council;
- The individual site is not planned to be sold, demolished or let out within the next five years (based on currently known and approved plans);
- The proposed design must include a low carbon heating system such as air source/ water source/ ground source heat pumps. The heat demand of the building must be considered and heating systems sized appropriately to meet demand. Selection of ASHP models should consider the Seasonal Coefficient of Performance (SCOP) and those models with higher SCOPs preferred, providing they meet other technical and practical requirements.
- The design may also include energy efficiency measures and upgrades to the fabric of the building (e.g. insulation, draught-proofing, LED lighting) or to other elements of the plumbing and heating system (e.g. radiators, controls), and/or on-site renewable energy generation (such as solar PV), where these are specifically recommended either in the site's Heat Decarbonisation Plan or in the site's Energy Performance Certificate (EPC) Advisory report or the Display Energy Certificate (DEC) Recommendation Report, and the measures demonstrate good value for money and energy savings.
- Design proposals must include information detailing the estimated financial costs of the works, current and expected energy usage, projected energy savings, projected operational cost savings or increases, and carbon reductions from the project;
- For sites where heating systems are at/nearing end of life and need to be replaced anyway, the Decarbonisation Fund will only pay for the excess capital cost over and above the cost of replacing with a like-for-like / comparable gas heating system.
- The Council buildings programme is expected to achieve a simple average payback of 20 years or better for the total portfolio investment, when taking into account the value of carbon. (Individual projects may exceed this as long as the average is maintained);
- If the capital cost contribution from the Decarbonisation Fund for any individual project for Council buildings decarbonisation is likely to be greater than £500,000, the business case will come forward to Environment and Green Investment Committee for approval. (Projects valued less than £500,000 may be approved by Delegated Authority to the Executive Director Finance and Resources, in consultation with the Executive Director Place and Sustainability and the Chair/ Vice Chair of Committee);
- The total investment for the Decarbonisation Fund remains within the overall programme budget, taking into account committed projects at both council buildings and schools.

2.17 Option 2: Set up a new 'Invest to Save' Fund for energy efficiency and solar measures for

Council buildings (similar to the previous Energy Efficiency Fund of £1million) and progress this as part of the council's phase 2 Net Zero Programme, through the business planning process. This option would not start until 2024/25 at the earliest if successful in business planning.

2.18 Comparing the two options, option 1 would be the quickest and most straightforward solution. It will also help the Council to access further grant funding by aligning with the Salix guidance that a 'whole building approach' is preferred. Option 2 would be more likely to delay decarbonisation works. It would also not tie removal of fossil fuels and energy efficiency together but there may be other benefits such as being able to revisit the size of the total funding pot required. Having two separate funds would also be more complex to administer.

2.19 Therefore Option 1 is recommended.

3. Alignment with ambitions

3.1 Net zero carbon emissions for Cambridgeshire by 2045, and our communities and natural environment are supported to adapt and thrive as the climate changes.

The report above sets out the implications for this ambition in paragraphs 1.1, 1.5, 2.1 and 2.12 to 2.13.

3.2 Travel across the county is safer and more environmentally sustainable.

There are no significant implications for this ambition.

3.3 Health inequalities are reduced.

There are no significant implications for this ambition.

3.4 People enjoy healthy, safe, and independent lives through timely support that is most suited to their needs.

There are no significant implications for this ambition.

3.5 Helping people out of poverty and income inequality

There are no significant implications for this ambition.

3.6 Places and communities prosper because they have a resilient and inclusive economy, access to good quality public services and social justice is prioritised.

There are no significant implications for this ambition.

3.7 Children and young people have opportunities to thrive.

Some of these sites provide important services for children and young people. For example, Woodland Lodge is a children's home. Burwell House offers residential and non-residential

courses for children, young people and adults. Our libraries are also important places of learning for children and others. These sites will benefit from the updated heating systems with a reduced carbon footprint.

4. Significant Implications

4.1 Resource Implications

The report above sets out details of significant implications in paragraphs 1.2, 1.6, and 2.2 to 2.17.

4.2 Procurement/Contractual/Council Contract Procedure Rules Implications

All project works are being carried out using either the Council's existing property minor works framework or the Council's existing energy performance contracting framework. The most appropriate framework will be selected by the Property team on a case-by-case basis, depending on the size and nature of each project. The property framework is used for general minor construction works and mechanical/electrical work. This requires a secondary competition to award a contract, which ensures value for money. The energy performance contracting framework provides access to more specialised energy expertise and provides the option of an energy performance guarantee, which can be beneficial for some larger or more complex projects.

4.3 Statutory, Legal and Risk Implications

All building works will need to comply with Building Regulations, Health and Safety legislation and policies, and Property's pending Asset Strategy and Corporate Landlord Model.

4.4 Equality and Diversity Implications

Access to some buildings by staff and service users may, for some of the projects, be temporarily restricted whilst works on site are taking place. This could include temporarily closing buildings or relocating access routes, workspaces and services to other parts of the building or other buildings. Alternative plans have been / will be put in place where required to ensure staff and service users with protected characteristics are not negatively impacted.

An Equality Impact Assessment screening has been completed - reference number is CCC525398573.

4.5 Engagement and Communications Implications

The Council's Energy and Property FM teams have worked together to identify a list of properties to bring forward projects to replace oil or gas heating with ASHPs. The project teams have worked closely with building users to co-ordinate works at the sites where projects are taking place.

4.6 Localism and Local Member Involvement

Members have been informed about the Low Carbon heating Programme through reports to the Green Investment and Utilities Advisory Group.

4.7 Public Health Implications

There are no significant implications within this category. However, reducing our carbon footprint and helping to mitigate climate change has public health benefits in the long term.

4.8 Climate Change and Environment Implications on Priority Areas (See further guidance in Appendix 2):

4.8.1 Implication 1: Energy efficient, low carbon buildings.

Positive/neutral/negative Status: Positive

Explanation: This programme will directly help to deliver energy efficient, low carbon buildings. The proposed changes to the investment criteria will enable more energy efficiency measures (such as LED lighting, insulation, heating system controls) and renewable energy generation (such as rooftop solar PV) to be installed. These 'fabric first' retrofits are better in the long term as they will reduce energy consumption. In some cases the upgrades could mean that smaller and cheaper air source heat pump models could be selected too, because of a reduced heat demand.

4.8.2 Implication 2: Low carbon transport.

Positive/neutral/negative Status: Neutral

Explanation: No impact

4.8.3 Implication 3: Green spaces, peatland, afforestation, habitats and land management.

Positive/neutral/negative Status: Neutral

Explanation: No impact

4.8.4 Implication 4: Waste Management and Tackling Plastic Pollution.

Positive/neutral/negative Status: Neutral

Explanation: No impact

4.8.5 Implication 5: Water use, availability and management:

Positive/neutral/negative Status: Neutral

Explanation: No impact

4.8.6 Implication 6: Air Pollution.

Positive/neutral/negative Status: Neutral

Explanation: No impact

4.8.7 Implication 7: Resilience of our services and infrastructure, and supporting vulnerable people to cope with climate change.

Positive/neutral/negative Status: Neutral

Explanation: No impact

Have the resource implications been cleared by Finance? Yes

Name of Financial Officer: Mike Falconer

Have the procurement/contractual/ Council Contract Procedure Rules implications been cleared by the Head of Procurement and Commercial? Yes

Name of Officer: Clare Ellis

Has the impact on statutory, legal and risk implications been cleared by the Council's Monitoring Officer or Pathfinder Legal? Yes

Name of Legal Officer: Emma Duncan

Have the equality and diversity implications been cleared by your EqIA Super User?

Yes

Name of Officer: Sheryl French

Have any engagement and communication implications been cleared by Communications?

Yes

Name of Officer: Kathryn Rogerson

Have any localism and Local Member involvement issues been cleared by your Service Contact? Yes

Name of Officer: Sheryl French

Have any Public Health implications been cleared by Public Health?

Yes

Name of Officer: Iain Green

If a Key decision, have any Climate Change and Environment implications been cleared by the Climate Change Officer?

Yes

Name of Officer: Emily Bolton

5. Source documents

5.1 Source documents and location

- Report for E&S Committee, June 2020: [Document.ashx \(cmis.uk.com\)](#)
- Minutes from E&S Committee, June 2020: [Document.ashx \(cmis.uk.com\)](#)
- Report for E&GI Committee, March 2022: [Document.ashx \(cmis.uk.com\)](#)
- Minutes from E&GI Committee, March 2022: [Document.ashx \(cmis.uk.com\)](#)

Appendix A – Project list

Site	Project status	Forecast capital cost	Grant funded	Forecast carbon savings (tCO2e/year)
33 Haviland Way	Finished	£ 183,798.54	38%	16.5
78 Victoria Road	Finished	£ 118,202.15	47%	8.3
Bargroves Resource Centre	Finished	£ 385,016.10	57%	30.2
Cottenham Library	Finished	£ 76,770.09	53%	3.0
Ely Branch Library	Finished	£ 273,611.86	28%	6.1
Hereward Hall	Finished	£ 415,502.92	74%	22.1
Huntingdon Community Centre	Finished	£ 354,702.83	76%	32.8
Huntingdon Library	Finished	£ 399,481.50	26%	14.9
Larkfield Resource Cent	Finished	£ 524,112.34	75%	41.3
Scott House	Finished	£ 505,985.14	27%	19.8
Victoria Lodge	Finished	£ 129,049.69	32%	12.2
Woodland Lodge	Under construction	£ 305,116.45	29%	15.5
Burwell House	Under construction	£ 576,746.44	61%	24.1
Roger Ascham	Finished	£ 97,961.53	50%	5.0
Cambridge Central Lib	Finished	£ 376,250.07	86%	43.7
Chatteris Library	Finished	£ 95,076.71	85%	8.3
March Library	Finished	£ 89,919.70	100%	13.8
Ramsey Library	Finished	£ 77,508.81	92%	7.8
Shortsands Day Centre	Finished	£ 91,946.92	100%	13.3
Stanton House	Finished	£ 141,367.48	98%	20.4
Wisbech Library	Finished	£ 51,696.55	42%	3.2
Bassingbourn preschool	Finished	£ 44,880.57	0%	7.4
Hawthorns ITSH	Design phase	£ 467,356.45	0%	14.3
Buttsgrove	Design phase	£ 361,153.02	61%	42.6
March Community Cen	Design phase	£ 519,556.63	70%	32.8
Sackville House	Design phase	£ 166,921.70	7%	25.8
St Neots Library	Design phase	£ 319,623.19	84%	14.3
Tennyson Lodge	Design phase	£ 163,243.58	19%	18.0
TOTAL (28 sites)		£7.139m	51%	518

Appendix B – Information about the Schools Low Carbon Heating Programme

In July 2021, the Environment & Green Investment Committee agreed a funding package for a programme of Low Carbon Heating projects on maintained schools. This included:

- Public Sector Decarbonisation Scheme grant funding where this can be secured; and
- An Environment Fund capital contribution equivalent to the monetised value of the projected carbon savings; and
- A School Condition Allowance contribution equivalent to the cost of replacing the boilers on a like for like basis; and
- Loan funding with no uplift over the Council’s own borrowing cost.

In addition Committee agreed to a portfolio approach allowing surplus monetised carbon savings from stronger projects to be used to cross subsidise projects with more challenging business cases.

Schools projects for which grant funding has been secured to date are tabulated below.

Site	PSDS Phase	Project status	Forecast capital cost	Grant funded	Forecast carbon savings (tCO _{2e} /year)*	
Ashbeach	Phase 2	Finished	£184,422	38%	16.2	
Harston & Newton		Under construction	£230,630	50%	18.0	
Great Gidding		Under construction	£109,913	39%	5.7	
Eastfield	Phase 3a	Under construction	£348,555	50%	24.0	
Great Wilbraham		Under construction	£345,973	44%	21.6	
Sawtry Infants		Under construction	£342,205	52%	25.9	
Westfield		Under construction	£411,410	47%	27.9	
Benwick		Summer 2023 start	£273,462	30%	24.4	
Hauxton		Summer 2023 start	£246,086	35%	11.3	
Homerton Nursery		Summer 2023 start	£308,827	41%	16.2	
Meridian		Phase 3b	Summer 2024 start	£645,642	61%	54.2
Ridgefield			Summer 2024 start	£360,680	45%	24.2
Robert Arkenstall	Summer 2024 start		£425,409	43%	25.4	
Stretham	Summer 2024 start		£522,283	41%	26.6	
Caldecote	Summer 2024 start		£492,201	28%	19.7	
Huntingdon Nursery	Summer 2024 start		£257,229	14%	10.3	
Townley	Summer 2024 start		£274,775	30%	12.3	
Barton	Summer 2024 start		£381,269	22%	15.8	

Site	PSDS Phase	Project status	Forecast capital cost	Grant funded	Forecast carbon savings (tCO _{2e} /year)*
Elsworth		Summer 2024 start	£422,130	26%	16.6
Gt & Lt Shelford		Summer 2024 start	£497,314	39%	29.4
Paul's		Summer 2024 start	£525,831	48%	35.5
St Philip's		Summer 2024 start	£604,258	57%	49.0
Elton		Summer 2024 start	£420,551	35%	20.7
Total (23 sites)			£8.631m	41%	530.6

*average annual savings over 20 year operational lifetime