

Finance and Resources

10.00am, Friday, 6 December 2019

Feasibility of Deep Energy Retrofit of Operational Council Buildings

Executive/routine Wards Council Commitments	Executive All
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1. Recommendations

- 1.1 It is recommended that the Committee:
- 1.2 Notes that a budget of £100k is required to fully explore the feasibility, impact and strategic and financial value of undertaking deep energy retrofits;
- 1.3 Notes that the feasibility study, if funding was identified, would focus on representative building archetypes from key construction periods across the Council estate; and
- 1.4 That members consider funding a feasibility study as part of the budget setting process for 202/21.

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Report

Feasibility of Deep Energy Retrofit of Operational Council Buildings

2. Executive Summary

2.1 This report has been prepared in response to a motion approved by the Policy and Sustainability Committee, on 6 August 2019, requesting that the Council explore the feasibility of undertaking a deep energy retrofit for Council buildings. In order to progress with a feasibility study, a budget of £100k is required. Subject to funding being identified, a focus of the feasibility study will be to seek to establish the parameters under which a deep energy retrofit delivers best value across representative building archetypes.

3. Background

- 3.1 On 6 August 2019, the Policy and Sustainability Committee approved a new [Energy Management Policy for Operational Buildings](#). Following on from a motion from Councillor Main, Committee agreed to the following two actions against this report ([Minute](#) Section 10, decision 4 and 5):
- To agree to explore the feasibility to undertake a deep retrofit to building regulations Gold, or PassivHaus standard, of at least one Council building per year; and
 - To agree that the Finance and Resources Committee would receive a further report on the current programme identifying which building(s) would be retrofitted during 2019-20 and what standard would be achieved.
- 3.2 The Council has approved a new [Sustainability Approach](#) which sets a net zero carbon target for Edinburgh by 2030. Under the Sustainability Approach, the Council has commissioned independent research to inform a roadmap for meeting the 2030 targets. A feasibility study in to the deep energy retrofit of Council buildings will help inform how both operational buildings and the wider city and can contribute towards the delivery of this target.

- 3.3 In November 2018, Property and Facilities Management produced a briefing note in response to an action from September 2018 Finance and Resources Committee ([Item 5.2 Rolling Actions Log - Point 15](#)) to summarise the outcomes from the 3 year Knowledge Transfer Partnership with Edinburgh Napier University. The note provided an overview of the key considerations and challenges that the Council faced in the drive to reduce carbon emissions across its operational properties. This included a recommendation that further research and consultation was required to define the best approach for improving the fabric across the Council's operational buildings and highlighted Passivhaus retrofit standard, [EnerPHit](#), as an option for existing buildings with a long-term future. The requested action from Policy and Sustainability Committee would build on the work undertaken during the Knowledge Transfer Partnership.
- 3.4 The Council is committed to reducing its carbon footprint across its operational property estate and has made significant progress in recent years. For new build properties, through analysis undertaken during the Knowledge Transfer Partnership with Edinburgh Napier University, Property and Facilities Management have led on the identification of Certified Passivhaus Classic as the appropriate standard to adopt in response to the challenges faced, with a view to progressing on to Passivhaus Plus and Premium in the future. Passivhaus is a proven standard which addresses the recognised performance gap between projected new building energy consumption and actual, operational, energy consumption, an issue recognised at a national level. In October 2019, Finance and Resources Committee approved the [award of a contract](#) for the design of three new Certified Passivhaus Primary Schools. Work is also underway on the feasibility of building a new Council High School (Currie) to Passivhaus standards.
- 3.5 The Council is investing significantly in its operational estate through the asset management works programme. Whilst the primary focus of these works remains the improvement in the condition of the Council's buildings, there has been a consequential benefit on energy efficiency through works such as boiler replacements, controls upgrades, lighting replacements, window replacements and roof replacements.
- 3.6 From an energy management perspective, there is a continued focus on investment and management of the Council's Building Energy Management Systems. In addition to capital funding routes, Property and Facilities Management draws on both the inhouse [SALIX](#) fund and Council spend to save funding to support energy efficiency and renewables projects. Work is also underway to increase the Council's renewable generation, with community-owned solar proposals from Edinburgh Community Solar Co-operative and The Friends of Duddingston Primary School currently under consideration. Furthermore, the Council is adding to its own solar estate through new build works and property refurbishments.

4. Main report

- 4.1 The action from Policy and Sustainability Committee includes two key actions: to explore the feasibility to undertake a deep retrofit to building regulations Gold, or Passivhaus standard, and; to identify which building(s) would be retrofitted during 2019-20 to building regulations Gold or Passivhaus Standard.
- 4.2 Given the complexities, time, cost and potential disruption to building users, it is not feasible to undertake such an extensive energy retrofit within 2019/20. This report will therefore aim to provide an overview of the considerations and approach for exploring the feasibility of a deep energy retrofit of the existing operational estate. The identification of specific buildings for retrofitting and any associated timescales for programming works will be given further consideration in the feasibility study. The purpose of this report is to seek consideration of a budget to progress with the feasibility study. Any buildings which are subsequently identified for deep energy retrofit are likely to cost more in terms of the initial capital required to retrofit. A portion of the extra capital cost would be offset by the future energy and operational cost savings but the return on this investment is not likely to fall within conventional payback periods.
- 4.3 There are clear distinctions between different standards and therefore the resulting outcomes. For example, Scottish Building Standards set carbon targets based on a Simplified Building Energy Model (SBEM). The model can have limitations, and certainly, as is the case with new builds, there can be a large gap between the modelled SBEM performance and the actual performance of buildings. Building standards silver, gold and platinum are only available for schools and include several other sustainability factors, not just energy, some of which may be more challenging for a refurbishment to meet. Careful consideration therefore needs to be given to both the design standards set and the delivered outcome.
- 4.4 At present, whilst there are a few established rigorous retrofit standards, knowledge of deep energy retrofit amongst both large estate holders and the wider construction industry is not at an advanced stage. There are only a few UK case studies detailing buildings that have been retrofitted extensively to rigorous standards such as [EnerPHit](#) (the Passivhaus retrofit standard). This emphasises the importance of undertaking a feasibility study to ensure appropriate planning and actions, as well as advancing in-house Council knowledge.
- 4.5 A focus of the feasibility study would be to seek to establish the parameters under which a deep energy retrofit delivered best value. There are other routes to decarbonisation, such as through the electrification of heat, or through onsite renewables. Consideration needs to be given to where the balance of best value sits between reducing energy demand and decarbonising energy supply.
- 4.6 The building archetype will influence the feasibility of delivering a deep energy retrofit. Predominant factors will be the practicality of improving the thermal properties of the building (i.e. increased insulation, air permeability and triple glazing) and the best value balance between reducing energy demand and decarbonising the supply of energy. The Council operates a diverse estate with a

wide range of buildings. One of the first actions of the feasibility study will be to identify which specific building archetypes will be targeted for review.

- 4.7 It is important to note that from an operational perspective, what may work in one building might not work in another for either practical or operational reasons. For example, it may not be feasible or cost effective to close a building for 12 months to carry out disruptive works therefore, other interventions to reduce carbon may be deemed more cost effective. Similarly, the scale of measures that can be considered may be restricted by planning constraints. The feasibility study will aim to detail the scales of intervention available to the specific building archetypes and outline potential operational impacts.
- 4.8 Improving the energy efficiency of the Council's built estate is a key objective of Property Facilities Management. However, to deliver on carbon reduction targets, we must expand beyond individual buildings and consider what is best for the wider area in line with the Scottish Government's consultation on the requirement for [Local Heat and Energy Efficiency Strategies](#). The outcomes of the feasibility study would help inform these objectives.
- 4.9 As part of Property and Facilities Management's Energy Management System, a steering group has been set up with key managers to help drive forward the aims and associated objectives of the Energy Management System (in line with requirements as set out under [ISO50001](#)). This steering group will provide oversight of the feasibility study. Strategic Asset Management will be responsible for commissioning the feasibility study and budget management. The Capital Programmes Team will provide technical oversight and project management support. The Energy and Sustainability Team will provide support and input as a key stakeholder.

5. Next Steps

- 5.1 Subject to approval of scope and budget for the feasibility study, Strategic Asset Management will raise a commission for the delivery of the feasibility study.
- 5.2 Given the current knowledge and experience of the market, it will be important to ensure that a consultant(s) or institution with appropriate knowledge and skill is engaged to carry out the feasibility study. The Capital Programmes Team, in consultation with other key stakeholders, will investigate routes to delivery and progress any subsequent procurement.
- 5.3 Subject to funding, Property and Facilities Management will report back, in due course, to Finance and Resources Committee to update/seek approval on appointment and advise on the costs, timescales and final scope for the project.

6. Financial impact

- 6.1 In 2018/19 the Council spent £5.8m on Electricity and £3.2m on Gas use across its operational buildings resulting in 37,334 tonnes of CO₂ Emissions. The delivery of more efficient buildings will help reduce associated energy charges and carbon emissions.
- 6.2 The request for a provisional budget of £100k is reflective of the level of detail and analysis that will be required to properly inform the feasibility study. Once further work has been carried out to progress selection of an appropriate consultant/institution to deliver the works, Property and Facilities Management will report back on anticipated cost. The Committee is however advised that £100k is not available to underwrite this work, given the revenue budget status for the Resources Directorate as reported elsewhere on this agenda.
- 6.3 It is important to note that, whilst there would be a reduction in energy costs resulting from a deep energy retrofit, the investment required to carry out a deep energy retrofit is unlikely to fall within the terms of conventional payback periods.

7. Stakeholder/Community Impact

- 7.1 Investigating the feasibility of deep energy retrofit will contribute towards the Council's objective to mitigate its carbon impacts and adapt to climate change assisting in the delivery of the Council's obligations under the [Climate Change Act \(Scotland\)](#).
- 7.2 By leading on the investigation of innovative and rigorous best practice energy efficiency solutions the Council can demonstrate further opportunities for carbon reduction across its estate and set a positive example for organisations within Edinburgh and more widely.

8. Background reading/external references

- 8.1 [Corporate Policy and Strategy Committee, Tuesday 14 May 2019, Sustainability Approach](#)
- 8.2 [Policy and Sustainability Committee, Tuesday 6 August 2019, Energy Management Policy for Operational Buildings](#)
- 8.3 [Finance and Resources Committee, Thursday 10 October 2019, Appointment of specialist design team to deliver three new primary schools to Certified Passivhaus standard](#)
- 8.4 [The future of energy in Scotland: Scottish energy strategy, Scottish Government, December 2017](#)

9. Appendices

9.1 None