Agenda Item

Report

Report to:	**Climate Change and Sustainability Committee**
Date of Meeting:	**15 May 2024**
Report by:	**Executive Director (Housing and Technical Resources)**

Subject:	**Non-Domestic Buildings – Net Zero Feasibilities**

1. Purpose of Report

1.1. The purpose of the report is to: -

- provide an update on the outcome of seven feasibility studies, conducted to assess the investment required to achieve national net zero standards for the Council's primary school and wet leisure estate
- provide an updated estimate of total capital investment required to meet national net zero standards for the council's non-domestic property estate based on the outcome of the feasibility studies

2. Recommendation(s)

2.1. The Committee is asked to approve the following recommendation(s):-

(1) that the outcome from the feasibility studies completed be noted;
(2) that it be noted that the updated estimate of total capital investment that would be required to achieve national net zero standards is £927m, based on the outcome of the feasibility studies;
(3) that it be noted that the Scottish Government intend to legislate that all non-domestic buildings in the public sector should be using clean heating systems by 2038 which will require the Council to replace fossil fuel heating systems at around 300 properties; and
(4) that the Council's existing fabric first approach around retrofit investment decisions be noted.

3. Background

3.1. The Scottish Government has set out ambitious emission reduction targets in legislation with the intention for Scotland to become net zero by 2045.

3.2. Through the proposed Heat in Building's Bill, currently under development, the Scottish Government intends to legislate for non-domestic buildings in the public sector to be using clean heating systems by the end of 2038. This means that no such council building would be permitted to burn fossil fuels to generate energy for heating or hot water systems. Currently, just under 300 of the Council's non-domestic properties are heated using fossil fuels.

3.3. It is anticipated that as fossil fuels are replaced by electrically powered solutions for heating and transport, that the demand on the electricity grid is likely to double, which has implications in terms of stability of supply.

3.4. To better understand the practical challenges and financial implications from this proposed legislation, Housing and Technical Resources committed to conducting a range of feasibility studies across the Council's non-domestic estate, aiming to quantify what would be required to achieve net zero within these building types.

4. Modelling of measures to set on the path to net zero.

4.1 Funding for the seven feasibility studies was secured through the council's Climate Emergency Fund. Four primary school and three wet leisure properties were selected with the intention to cover a range of build contractor, geographical location, and year of construction. In total, these property types account for circa 48% of carbon emissions from all the Council's non housing buildings.

4.2. The assessment process utilised modelling tools to understand how the properties in the study performed in theory against reality. 'Digital Twin' models for each building were constructed and the modelled outputs compared to real life performance utilising energy billing data.

4.3. Once the Digital Twin for each building had been calibrated, the effect of applying a series of retrofit measures incrementally was modelled to output expected energy, carbon, and cost reductions.

4.4. The Digital Twins were then used to model the effect of installing each of the retrofit measures shown in Table 1 sequentially.

Measure	Purpose	Impact on Energy consumption
1. Fabric Updates	Improves **energy efficiency** of building fabric reducing the amount of energy required to heat the building.	Reduces gas / oil usage.
2. Light Emitting Diode (LED) lighting	Improves **energy efficiency** with respect to electricity usage for lighting in the building.	Reduces electricity use however gas / oil usage increases as additional heating is required to offset the loss of internal gains.
3. Air Handling Unit (AHU) improvements, pumps, and fans	Improves **energy efficiency** by optimizing the existing building systems.	Reduces both electricity and gas / oil usage.
4. Ground Source Heat Pump (GSHP) for all heating and Domestic Hot Water (DHW) requirements	Improves **energy efficiency** and eliminates fossil fuel usage to achieve **Zero direct emissions** heat targets.	Eliminates gas / oil usage for heating / hot water. Electricity increases by approx. 1 kWh for every 3 - 4 kWh of gas /oil previously used for heating.
5. Photo Voltaic (PV) panels added to the roof	Self-generation of electricity helps offset cost of procuring electricity from the grid supply	None

Table 1: Retrofit Measures

4.5. Table 2 provides a summary of the outcomes, combining the results for all four schools detailing the effect on energy usage, carbon emissions, and operational cost. Please note the percentage savings expressed below are cumulative.

Measure	Cumulative Energy Reduction	Cumulative Carbon Reduction	Cumulative Operational Cost Reduction
None	0%	0%	0%
Fabric Updates	15%	14%	8%
LED lighting throughout	16%	16%	19%
AHU improvements, pumps, and fans	21%	21%	22%
GSHP for all heating an DHW requirements	66%	63%	11%
PV panels added to roof	66%	64%	20%

Table 2: Combined expected Energy, Carbon, and Operational Cost reductions for the Primary School properties.

4.6. Similarly, a summary of the findings combining the results for the three wet leisure facilities selected is shown below in Table 3. Again, note that the figures savings figures are cumulative.

Measure	Cumulative Energy Reduction	Cumulative Carbon Reduction	Cumulative Operational Cost Reduction
None	0%	0%	0%
Fabric Updates	17%	16%	10%
LED lighting throughout	17%	17%	14%
AHU improvements, pumps, and fans	22%	22%	24%
GSHP for all heating an DHW requirements	68%	66%	3%
PV panels added to roof	68%	66%	6%

Table 3: Combined expected Energy, Carbon, and Operational Cost reductions for the Wet Leisure properties.

4.7. As illustrated within Tables 2 and 3, the studies suggest that significant energy and carbon reductions can be achieved by investing in the measures identified in Table 1 in sequence. However, operational cost reductions, as shown in column 4 in tables 2 and 3 above, which would typically be used to financially appraise investment decisions, are far less significant. For example, the average investment required for a primary school included in this feasibility exercise was £3.3m. The average modelled utility cost savings for this level of investment would be just £16,500 per annum. This would imply a simple financial payback of around 200 years.

4.8. Finally, the findings from these seven feasibility studies were extrapolated across the council's non housing estate to estimate the level of investment required to transition these properties towards net zero. The result of this exercise suggested around £927 million of capital investment would be required at 2023 prices for the existing non-housing portfolio. Around £192 million of this figure relates to properties currently operated by South Lanarkshire Leisure and Culture.

5. Current position

5.1. The Council has a fabric first approach to improving the energy efficiency of its non-domestic buildings, which aims to reduce energy consumption, leading to reduced operating costs and lower carbon emissions. These energy efficiency improvements are outlined as measures 1, 2 and 3 in Table 1.

5.2. Investment in such measures is already taking place across the Council's non-domestic estate, with the funding made available through Lifecycle and/or CEEF funding sources.

5.3. Due to the capital costs and running cost increases from currently available clean heating systems (measure 4 in Table 1), the Council does not have a programme for the replacement of its fossil fuel systems across its non-domestic estate at present.

6. Next Steps

6.1. The Council await the outcome of the Scottish Government's consultation on the proposed Heat in Buildings Bill, expected later in 2024/25. This will confirm the legislative timeline for the new net zero standards to be introduced and detail any additional support or grant or private sector funding routes that may be available to local authorities to support the transition.

6.2. The outcomes of the feasibility studies and modelling for the councils' other non-domestic properties will be incorporated into the South Lanarkshire Local Heat and Energy Efficiency Strategy, subject to approval at Executive Committee on 26 June 2024. Through this long-term framework, considerations can be made as to how these buildings can be transitioned to net zero, potentially aligning with other improvement projects and accessing suitable grant or private sector funding.

7. Employee Implications

7.1. Many of the Council's non-domestic properties are heated through gas boiler systems and maintained through internal services or external contracts. Should a significant proportion of these be replaced there will be implications on employees with upskilling or training required to service and maintain these new systems. Operation of systems will also differ, again requiring training for relevant officers.

8. Financial Implications

8.1. As detailed at 4.8, significant investment will be required to transition the Council buildings to a net zero standard. The expected funding required is estimated to be over £900m over the next 14 years, which significantly outstrips available funding of any of the existing internal investment programmes or potential grant funding opportunities currently available.

8.2. As referenced at 5.2, the council does have limited funding to progress some energy efficiency measures on its non-domestic estate, which will make a small contribution to achieving the proposed standards. Additional resources will be required, however, to implement a full fabric first approach.

8.3. The transition of heating away from fossil fuel sources by installing measure 4 in Table 1, while essential for meeting carbon reduction targets, has significant financial implications in terms of both capital and day-to-day running costs. Albeit policy decisions by UK Government on whether to remove renewable levies applied to electricity charges could significantly change the economics of this.

8.4. Taking account of the scale of investment required alongside the legislative requirement to reduce emissions, it is essential that consideration is given to the

funding/partnership delivery models that are currently available and seek to agree which model best suits the Council's requirements. Whilst the Scottish Government have stated that they will provide some limited funding towards the transition, it is anticipated that private sector funding routes will also be explored.

9. Climate Change, Sustainability and Environmental Implications

9.1. Failure to meet sustainable development and climate change objectives is one of the Council's top risks. The council's Local Heat and Energy Efficiency Strategy (LHEES) is currently out for consultation. One of the main objectives of LHEES will be to set out how the council will seek to decarbonise heat and increase energy efficiency within council owned properties.

9.2. Should the Council successfully transition to net zero and achieve the proposed legislative standards, it is expected to have a positive impact on efforts to tackle climate change.

10. Other Implications

10.1. The decarbonisation of heat from the Council's non-Domestic property portfolio is essential for the Council to meet the Emissions Reductions Targets set in regulation by the Scottish Government.

10.2. The shape and nature of the council's property portfolio has been driven by the requirements of individual services. However, prior to embarking on the required programme of investment, a fundamental review of service and area need should be undertaken to identify opportunities to reduce the property estate and to maximise the service benefits from the investment in the remaining assets.

11. Equality Impact Assessment and Consultation Arrangements

11.1. The Sustainable Development and Climate Change strategy has undertaken a public consultation, an equalities impact assessment, and a Fairer Scotland assessment.

Stephen Gibson
Executive Director (Housing and Technical Resources)

24 April 2024

Link(s) to Council Values/Priorities/Outcomes

Values

- Focused on people and their needs
- Working with and respecting others
- Accountable, effective, efficient and transparent
- Ambitious, self-aware and improving
- Fair, open and sustainable
- Excellent employer

Priorities

- We will work to put people first and reduce inequality
- We will work towards a sustainable future in sustainable places
- We will work to recover, progress and improve

Outcomes

- Our children and young people thrive
- Good quality, suitable and sustainable places to live
- Thriving business, fair jobs and vibrant town centres
- Caring, connected, sustainable communities

- People live the healthiest lives possible
- Inspiring learners, transforming learning, strengthening partnerships

Previous References

- None

List of Background Papers

- None

Contact for Further Information

If you would like to inspect background papers or want further information, please contact: -

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