**Options Appraisal of heating options at Floral House Independent Retirement Living accommodation – Andy Vincent, Corporate Head of Housing**

**Synopsis of report:**

**This report considers the business case for the installation of different types of communal heating systems in Floral House Retirement Living accommodation.**

**The current heating system is at the end of its expected life.**

**The report also considers the carbon reduction achieved via the different systems.**

**The report sets out fabric first measures which can also be installed to reduce emissions from the scheme and reduce energy bills.**

**Recommendation(s):**

**i. that a new gas boiler and additional fabric measures are installed in Floral House to reduce emissions from the scheme and reduce resident's fuel bills.**

1. **Context and background of report**

1.1 Runnymede Borough Council manages 5 Independent Retirement Living Schemes: -

1. Beomonds
2. Darley Dean
3. Floral House
4. Grove Court
5. Heatherfields

1.2 At Floral House the communal gas boiler is at the end of its expected life.

1.3 A budget exists to replace these boilers with modern like-for-like replacements which would have a life expectancy of between 20-25 years.

1.4 Runnymede Borough Council have published a Climate Change Strategy. It commits the authority to; "*reduce Carbon emissions from Council operations to Net Zero by 2030.*"

1.5 It is calculated that the existing heating systems at Floral House produces 76.7 tons of emissions annually through heating individual flats (this information is taken from the Energy Performance Certificates of the properties – an example is provided in appendix A). Data currently does not exist for emissions produced in Independent Retirement Living communal spaces.

## 2. Heat System Appraisals

2.1 Four different heating options are considered within this report to heat the flats and communal spaces in Floral House.

2.2 They are: -

1. Communal gas boilers
2. Communal air source heat pumps
3. Communal group source heat pumps
4. Electric space heaters

2.3 Table 1 provides a summary of the appraisal of each option. This appraisal is based on installation of the various heating systems without any additional energy efficiency measures to the scheme and utilizing the existing pipe and radiators in the flats and communal areas.

| | Current Gas Boiler at approximately 70% efficiency | Gas Boiler – at 90-95% efficiency | Air Source Heat Pump | Ground Source Heat Pump | Electric Storage Heaters<br><br>(including removal of existing pipework and boiler) |
|---|---|---|---|---|---|
| Installation cost | - | £100,000<br><br>(£4,000 per year based on 25-year life expectancy) | £250,000<br><br>(£16,667 per year based on 15-year life expectancy) | £425,000<br><br>(or £21,250 per year based on 20-year life expectancy) | £240,000<br><br>(£9,600 per year based on 25-year life expectancy) |
| Emissions from individual flats (annually) | Floral House 1.3 tons per property – total for the scheme = 76.7 tons | Approximately 54.8 tons at 90% efficiency<br><br>49.3 tons at 95% efficiency | Approximately 0.5 tons per property – total for the scheme = 29.5 tons | Approximately 0.4 tons per property – total for the scheme = 23.6 tons | 100% efficiency |
| Heating costs for tenants and Runnymede Borough Council for communal areas | 10.33p per kwh for gas<br><br>70% efficiency<br><br>13.43p per kwh | 10.33p per kwh for gas<br><br>90-95% efficient<br><br>10.84p per kwh | 50.54p per kwh for electricity<br><br>300% efficient<br><br>16.87p per kwh | 50.54p per kwh for electricity<br><br>400% efficient<br><br>12.64p per kwh | 34p per kwh overnight for electricity<br><br>100% efficient<br><br>34p per kwh |

| | | | | | |
|---|---|---|---|---|---|
| Life expectancy of system | | 20-25 years | 10-15 years | 20 years | 25 years |
| Maintenance costs | | | Increased from current system | Increased from current system | Less than current system |

3. **Analysis of the systems**

3.1 The system replacement costs spread over their 'best case' life expectancy, equate to: -

- Gas System £8,000 per year
- Air source heat pump £33,333 per year
- Ground source heat pump £42,500 per year
- Electric storage heaters £9,600 per year

This can be broken down per property per year for each scheme.

Gas Systems
£67.79 for Floral House

Air Source Heat Pump
£564.97 for Floral House

Ground Source Heat Pump
£720.34 for Floral House

Electric Storage Heaters
£162.17 for Floral House

3.2 The potential for heating costs for the various heating options is considered below (if these costs change relative to each other than this equation will change).

10.33p per kwh for gas. 50.54p per kwh of electricity. 34p for kwh of electricity overnight

The current gas system is 25 years old and is estimated to be 70% efficiency. A new gas system is 90-95% efficient, each hour of heating would therefore cost 10.84p. The air source heat pump is 300% efficient so each kwh of electricity generates 3 hours of heating or 16.87p per hour. The ground source heat pump is 400% efficient so each kwh of electricity generates 4 hours of heating or 12.64p per hour. The electric storage heaters are 100% efficient and are using electricity at 34p per hour overnight.

The major benefit achieved by the transition to an air source or ground source heating system is the carbon reduction achieved.

The air source pump uses a third of the power of a gas system and a ground source heat pump a quarter.

This equates to 16.43 tons of carbon per year for an air source system and 12.3 for a ground source system being produced should they be installed in the two Independent Retirement Living schemes a reduction from 76.7 tons from a traditional gas heating system.

3.3 However, the costs of installation of the air and ground source heat pumps (particularly the ground source heat pump) are significant. The installation of the electric storage heaters are equally as high as the Air Source Heat Pump and with the highest anticipated heating bills of any of the 4 systems.

3.4 Whilst this increase in heating costs for tenants is significant for any alternatives to a gas boiler based on current prices, on 30th March, the Government published its Powering Up Britain report (see background documents). This reconfirms that the Government has an ambition to phase out all new and replacement natural gas boilers by 2035 at the latest and will further consider the recommendation from the Independent Review of Net Zero in relation to this. This document contains the expectation that in the future, 'People's homes will be heated by British electricity, not imported gas'. The Powering Up Britain Report is also clear that, 'Established technologies, such as offshore wind turbines, need to be deployed at pace to meet our ambitions for decarbonising power and delivering wholesale UK electricity prices that rank among the cheapest in Europe by 2035', with a potential doubling of Britain's electricity generation capacity doubled by the late 2030s. Therefore, the high energy prices currently observed are not expected to remain into the medium and long term with electricity prices appearing likely to fall as part of the Government's net zero strategy. This is considered to be a material factor to weigh in the balance when considering alternatives to installing a gas boiler.

3.5 Even in the short term, Ofgem's price cap (which limits the price people pay for their energy. The price cap has been replaced by the Energy Price Guarantee as the cap on consumer energy bills until April 2024) is now predicted to fall below £2,000, based on average typical use, from July, for the first time since 2022 with some experts saying we could see prices similar to what we had back in mid-2022. At the end of February 2023, energy watchdog Ofgem dropped its latest energy price cap for April - June 2023 to £3,280 - almost £1,000 lower than the January cap. Investec is now predicting Ofgem's energy price cap, which is revised quarterly, will be set at £1,981 for the third quarter onwards. It could fall further in the fourth quarter, with the investment firm predicting a cap of £1,966 for the final three months of the year. This reflects a fall in wholesale energy prices, but it's important to note that this is just a projection at this stage. Energy markets are volatile and further changes are possible[1].

3.6 For Runnymede Borough Council as landlord, the electric storage heaters would have the highest heating costs in the communal areas out of the 4 options explored based on current prices, although this could be partially offset by the reduced maintenance costs of this option, with it being the only one of the options explored which is expected to actually reduce maintenance costs. For all the options, as for tenants, the Council is also expected to benefit from falling energy prices should they occur. Furthermore, the Council will shortly sign up to a new energy framework for the 2024-2028 period with

LASER Energy. The current LASER frameworks that the Council is part of, have delivered cost avoidance of £153k pa to Runnymede BC since they commenced. Energy market prices have increased by 1,200% over the past two-years to unprecedented levels. Although this presents a significant budget shock, LASER's flexible procurement strategies have proven highly effective, with achieved basket prices for the current contract year being 50-85% lower than peak market prices. As part of the 2024-2028 framework, it is proposed to move the communal areas from the Council's housing stock, including the communal areas in our IRL schemes into the Council's agreement with LASER. This has the potential to reduce electricity prices being paid for this part of the Council's estate.

3.7 In addition, LASER has developed an innovative approach to buying electricity directly from renewable generators from the suppliers' portfolio via the flexible framework agreement. This is known as the Green Basket. Officers will be exploring options for greener energy as part of this framework period to support the Council's ability to achieve net zero for its operations and services by 2030. It is expected that up to 2030, a greater proportion of the Council's electricity supply will be from renewable energy. If the electricity for the heating system at Floral House is, in the future generated via a renewable source, the carbon produced in electricity generation will be zero. This same benefit would not be realised if a gas boiler were to be installed.

3.8 The Powering Up Britain Strategy proposes to rebalance the costs of electricity and gas, which some commentators are suggesting will cut the cost of electricity at the expense of gas. As such, whilst in the short term, the costs of installing a gas boiler and the heating costs associated with them are the lower of the alternatives, when looking at the whole life costs of all four of the options set out in this paper, in the longer term, it is considered that there is a distinct possibility that the cost of gas could increase as part of the Country's net zero transition.

3.9 It is also considered relevant that whilst the cost of installing the electric storage heaters is equal to that of an Air Source Heat Pump, it is notable that this heating system has the longest expected lifespan of 25 years. Therefore, if the installation cost is considered as an annualised amount, it equates to approx. £9,600 over its lifespan. Whilst this is double the cost of the gas boiler, it is a significantly cheaper alternative to both heat pump options.

3.10 The Council needs to act to replace the existing heating system in Floral House. Currently replacing the gas heating system is the cheapest for both the Council and residents, in terms of their energy bills. How energy bills change over time will impact residents. It is predicted that electricity costs will reduce – these prices will need to reduce by over 20% for the cost of running heat pumps to align with a new gas boiler.

3.11 The installation of a new communal heating system will require affected flats to have their energy use individually metered. The Heat Network (Metering and Billing) Regulations revised in 2020 introduced a building classes that requires some heat suppliers with unmetered networks to install metering devices in the buildings they serve. This is likely to reduce energy use; as resident's usage will directly impact on their charged amount.

## 4. Policy Framework

4.1 Runnymede Borough Council's Housing Services has committed to ensuring all the council owned social housing units within the borough achieved a C energy efficiency rating by 2030.

4.2 The flats within the Independent Retirement Living schemes at Floral House are currently C rated.

4.3 Runnymede Borough Council's Climate Change Strategy 2022-2030 strategic objective 1, commits the authority to; "*reduce Carbon emissions from Council operations to Net Zero by 2030.*"

## 5. Resource implications/Value for Money

5.1 Resources are in place to fund the installation of a replacement gas heating system in the Capital programme. Capital growth is required to fund the installation of air source or ground source heating systems and/or additional energy efficiency measures and a separate provision has been made in the Capital Programme of £500,000 for this purpose subject to the submission of a full business case (appendix C) and committee approval should this be the preferred option.

5.2 The installation of an air source heat pump would require £150,000 of additional expenditure.

5.3 The installation of a ground source heat pump would require £325,000 of additional expenditure.

5.4 It is estimated that cavity wall insultation at Floral House would cost £50,000 and loft insulation £45,000 (information provided by Hamson Baron Smith).

It is estimated that cavity wall insulation would reduce energy usage by 643 kwh for a property not on the top floor of the accommodation (estimated total heating kwh usage 1720) and loft insulation by 908 kwh for a top floor property (estimated total heating kwh usage 2082) – see appendix A and B for Energy Performance Certificates of properties in Floral House.

The installation of cavity and loft insulation would only have a minimal impact on EPC scores and bands. This would leave properties in Band C with a SAP score of 76-79 (See appendix A and B)

The cost of 643 kwh: -

Gas heating at 95% efficiency is £69.70
Air source heat pump heating at 300% efficiency is £108.47
Ground source heat pump heating at 400% efficiency is £81.28
Electric storage heaters at 100% efficiency is £218.62

The cost of 908 kwh: -

Gas heating at 95% efficiency is £98.43
Air source heat pump heating at 300% efficiency is £153.18
Ground source heat pump heating at 400% efficiency is £114.77
Electric storage heaters at 100% efficiency is £308.72

## 6. Legal implications

6.1 As indicated in the body of the report the Council provides heating to a number of units occupied by tenants. The system which provided that heating is approaching end of life and the Council has to consider the replacement of those.

6.2 The Council is the landlord of the premises and the design of the premises is such that a communal heating system is installed. As landlord the Council is also responsible for the fabric of the building and can install measures which enhance the heat efficiency of the premises.

## 7. Equality implications

7.1 None – all social housing properties owned by Runnymede Borough Council will receive work to improve their energy efficiency.

7.2 This programme of work is set out in the Council's Housing Asset Management Plan – 2021-2026.

7.3 The issue of replacement boilers in Independent Retirement Living is identified within the Housing Asset Management Plan under Heating Types on page 11.

7.4 The purpose of this report is to consider what is the appropriate system to install.

## 8. Environmental/Sustainability/Biodiversity implications

8.1 This report has significant environmental implications. Replacing the current gas heating system with a more modern system could result in more than 27 tons of carbon savings per year; with a ground source heat pump resulting in more than in 64 tons of carbon savings each year.

## 9. Other implications

9.1 This report has implications for the heating costs faced by residents Floral House Independent Retirement Living scheme.

9.2 These implications are set out in section 2.2 of this report.

## 10. Timetable for Implementation

10.1 Following a decision on how to proceed with the installation of a new boiler at Floral House the service will move quickly to procure a contractor to install a new system. Details of the procurement will be presented to Housing Committee in 2023/24.

## 11. Conclusions

11.1 Replacing a communal gas boiler with an electronic heating system which produces fewer carbon emissions has implications for heating bills and limits resources available to achieve other requirements – such as Decent Homes.

11.2 Installing a heating system in Independent Retirement Living which significantly reduces the level of carbon emissions produced in heating the

schemes is a key step towards carbon reduction. Without this it is unlikely Runnymede Borough Council will produce zero emissions from its operations by 2030.

11.3 It is recommended that a new more efficient gas boiler is installed in Floral House. This will reduce the emissions produced by the existing system and utility bills for residents. It is also recommended that cavity wall and loft insultation is also installed to reduce bills and emissions levels further. The cost to Runnymede Borough Council of these measures (new gas boiler, cavity wall insulation, loft insulation) is approximated at £195,000.

**(To resolve)**

**Background papers**

Corporate Climate Change Strategy 2022-2030
https://www.runnymede.gov.uk/downloads/file/1533/climate-change-strategy

Housing Asset Management Plan 2021-2026 (item 9 on the agenda)
Agenda for Housing Committee on Wednesday, 21st September, 2022, 7.30 pm – Runnymede Borough Council

Commercial Heat Pump system | The Renewable Energy Hub

Powering Up Britain - Joint Overview (publishing.service.gov.uk)

An article on the future of energy prices: Will energy prices go down in 2023? | MoneyWeek

Fuel Poverty Strategy for England - Sustainable warmth: protecting vulnerable households in England (publishing.service.gov.uk)