

ROYAL BERKSHIRE FIRE AUTHORITY REPORT



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|---------------------------|--|
| COMMITTEE | FIRE AUTHORITY |
| DATE OF MEETING | 22 APRIL 2024 |
| SUBJECT | RBFRS SUSTAINABILITY PROGRAMME: PHASE 1 |
| LEAD OFFICER | PAUL BROOKS, HEAD OF ASSETS |
| LEAD MEMBER | COUNCILLOR SHEPHERD-DUBEY |
| EXEMPT INFORMATION | NONE |
| ACTION | FOR DECISION |

1. EXECUTIVE SUMMARY

- 1.1 The Authority is committed to reducing the impact of the organisation's operations on the environment and reducing its carbon footprint. The estate contributes 65% of the Authority's carbon output (1,524 tCO₂ per year) so, recognising there is a global climate emergency, investment is needed to reduce the negative impact our buildings have on the environment.
- 1.2 Estate strategic planning has included the production of estate heat decarbonisation plans (HDP) using specialist consultants, which was funded by central Government using the Low Carbon Skills Fund (LCSF) in 2023. The outcome of these HDPs has enabled the development of the first significant steps for the Authority to achieve its Net Zero Carbon agenda by investment in sustainability initiatives at 11 of the 17 sites in the portfolio.
- 1.3 This report provides context and an update on estate sustainability planning and seeks approval to spend £1.77M to deliver phase 1 sustainability projects as set out in the Strategic Asset Investment Framework (SAIF) as approved by the Authority in early 2024.
- 1.4 Notably, the SAIF expenditure will be significantly offset by the Salix Public Sector Decarbonisation Scheme funding (PSDS), a central Government grant of £927,845, recently awarded for five of our most energy inefficient fire stations. The grant funding process involves repayment in arrears, so the programme team need full budgetary assurance to support due diligence when entering into contractual commitments and the like. Over the course of two years, PSDS funding for these projects will amount to £927,845, reimbursed in stage payments.

- 1.5 Regular updates will be provided to Members and Officers via the Estates Development and Sustainability Working Group, Estates Development Group and the Service Programme Board.

2. RECOMMENDATION

- 2.1 It is recommended that the Fire Authority:

2.1.1 **APPROVE** a capital expenditure budget of £1.77 million for delivery of the 'RBFRS Sustainability Programme Phase 1' as set out in the SAIF.

2.1.2 **NOTE** that the above budget includes two distinct, but accountably connected, elements:

- Public Sector Decarbonisation Scheme (PSDS) grant funds of £927,845, administered on behalf of the UK Government by Salix
- RBFRS contributory funds of £842,155

2.1.3 **NOTE** that the PSDS element is on a cost recovery basis in arrears, which will lead to additional cash outflows in the short-term before reimbursement has been received.

3. BACKGROUND

3.1 The Authority is committed to reducing the impact of the organisation's operations on the environment and reducing its carbon footprint as confirmed in the signing of the 'Emergency Services Environment and Sustainability Group Charter' by the Fire Authority in February 2023. The estate contributes significantly to the overall environmental impact of a business, so 'Planet Mark' consultants¹ were commissioned in 2022 to complete a baseline study with results indicating our buildings contribute 65% of the Authority's carbon output (1,524 tCO₂ per year).

3.2 Noting the above, strategic planning was augmented in 2023 by the production of estate HDP using specialist consultants Faithful + Gould (now Atkins Realis²). This work was funded by central Government using the LCSF administered by Salix. The outcome of the work was a roadmap to help the Authority achieve its 'Net Zero' (NZ – see paragraph 3.4 for a definition) carbon ambitions by 2050, in line with the UK Government target, at 11 of the 17 sites in the portfolio. Notably, the 11 sites selected for the roadmap were prioritised on annual energy usage, fossil fuel utilisation for heating, building age and condition of the buildings (including the current and ongoing maintenance costs). Priority 1 sites are the only properties that currently qualify for PSDS funding applications. The 11 priority sites are:

- **Priority 1 (the subject of funding requested in this paper):**
 - Langley
 - Newbury
 - Reading: Caversham Road (accommodation annexe)
 - Reading: Wokingham Road
 - Whitley Wood (fire station)

¹ <https://www.planetmark.com/>

² <https://www.atkinsrealis.com>

- Priority 2:
 - Ascot
 - Bracknell
 - Lambourn
 - Maidenhead
 - Windsor
 - Slough

(Refer to **Appendix 1** for further details on sites and projects included within the RBFRS Sustainability Programme.)

3.3 It should be noted that forecasted benefits predominantly focus on Scope 1 and 2 emissions³ and the decarbonisation of heat – this is a necessary delineation as Scope 3 emissions are very complex and less related to the estate.

3.4 ‘Net Zero’ for the Authority will be formally defined and globally agreed in the emerging RBFRS Sustainability Strategy, but for the purposes of this report and the programme, Net Zero Carbon has been defined as:

“The carbon emissions associated with operational energy consumption across the estate are zero or negative on an annual basis. Most of the fuel and power is supplied from on-site and off-site renewable energy sources, with any remaining carbon balance offset.”

4. **REPORT**

4.1 Building on the successful LCSF grant bid and production of HDPs for the estate, RBFRS worked further with Atkins Realis during 2023 to develop a credible bid for funds from the PSDS Phase 3c scheme. Atkins Realis was commissioned via the NFCC’s National Decarbonisation Procurement Project, which is sponsored by RBFRS’ Deputy Chief Fire Officer. The RBFRS PSDS bid was submitted via the Salix application portal on 07 November 2023.

4.2 The bid process was complex and required a high level of diligence to assure Salix that RBFRS understood their estate and how to best meet the criteria and outcomes required to secure PSDS funding. RBFRS was one of only three Services to be approved for funding in the 23/24 PSDS Phase (3c). The process resulted in RBFRS receiving notification of a successful bid and full grant offer of £927,845 on 20 February 2024.

4.3 The PSDS grant funding focusses on eligible technologies to reduce energy demand and remove fossil fuels. Out of the 11 previously described sites, 5 were identified as the highest priority and in qualifying scope for the PSDS / SAIF combined funding (see **Table 1**). Improvement projects will be delivered using a ‘whole package’ approach⁴ to ensure the highest energy efficiency and carbon reduction is achieved to meet the minimum outcomes expected by Salix.

4.4 Salix will fund 52% percent of this project with RBFRS effectively ‘match funding’ at 48%. The residual 6 sites will be addressed within the wider sustainability programme as set out in the SAIF for 2026-2029. In the interim, further projects

³ <https://www.nationalgrid.com/stories/energy-explained/what-are-scope-1-2-3-carbon-emissions>

⁴ This approach sees a single professional consultancy (i.e., Atkins Realis) managing the entire project process from inception to completion and at least one-year of aftercare / contract administration.

such as LED lighting and Solar PV will be implemented at the priority 2 sites using SAIF budgets to improve energy efficiency and continue to reduce our carbon output.

| Site | Floor area (m ²) | Total carbon Saved (tCO ₂ e) | Priority PSDS / RBFRS |
|--------------|------------------------------|---|-----------------------|
| Ascot | 400 | 6 | 2 - RBFRS |
| Bracknell | 720 | 35 | 2 - RBFRS |
| Caversham Rd | 1,191 | 61 | 1 - PSDS |
| Lambourn | 183 | 10 | 2 - RBFRS |
| Langley | 774 | 43 | 1 - PSDS |
| Maidenhead | 1,144 | 35 | 2 - RBFRS |
| Newbury | 832 | 38 | 1 - PSDS |
| Slough | 1,103 | 51 | 2 - RBFRS |
| Whitley Wood | 1,864 | 48 | 1 - PSDS |
| Windsor | 223 | 6 | 2 - RBFRS |
| Wokingham Rd | 409 | 21 | 1 - PSDS |
| | Total | 354 | |

Table 1 – RBFRS Sustainability Programme priority 1 and 2 sites.

4.5 In the interests of consistency of approach, delivery coherence and to assist with realisation of benefits, it is proposed to deliver the priority 1 and 2 sites as a programme of work under a single governance umbrella. This will also support due diligence and facilitate robust cost control ensuring we get the most from our funds.

4.6 Technologies included in the programme are:

- Air source heat pumps
- Building fabric upgrades (loft Insulation, cavity wall, double/triple glazed windows)
- LED lighting
- Solar PV systems
- Building management systems (BMS)

4.7 **Financial position.**

4.7.1 The overall funding and forecasting position is in **Table 2**. It should be noted that the forecasted figures are what RBFRS' PSDS bid is predicated on and are as agreed with Salix.

| | |
|--|-------------------|
| Year 1: | |
| <ul style="list-style-type: none"> • Salix contribution £167,014 • RBFRS Contribution £294,952 | |
| Breakdown | |
| Design and engineering | £171,098 |
| Project management fees | £171,098 |
| Other project costs | £119,770 |
| Subtotal 1 | £461,966 |
| Year 2: | |
| <ul style="list-style-type: none"> • Salix contribution £760,831 • RBFRS Contribution £441,824 | |
| Breakdown | |
| Main equipment capital costs | £499,806 |
| Installation and commissioning | £309,324 |
| Contingency | £153,988 |
| Enabling measures | £239,537 |
| Subtotal 2 | £1,202,655 |
| Grand total | £1,664,621 |
| Grand total (rounded up per the SAIF) | £1,770,000 |

Table 2 – Combined PSDS / RBFRS Sustainability Programme funding and forecast.

4.7.2 The estimated payback period based on the RBFRS contribution of £842,155 is 9.4 years using data provided in the Salix PSDS support tool.

4.8 **Procurement strategy.** Echoing the programme approach covered earlier in the report, Atkins Realis has been commissioned via a separate public regulatory compliant framework to manage the programme ensuring there is a professional project management thread through each of the projects, including aftercare contract administration to cover warranty and defect liability periods. Project delivery contractors will be procured by competitive tenders, with complementary activities or technologies bundled where possible to reduce risk and seek best value. Langley Fire Station will have special attention as there is a pre-agreed SAIF refurbishment project over 2024-26 that will be subject to further Management Committee approval later this year. The intention for Langley is that a separate consultancy will be commissioned to act as the principal professional project manager taking the lead role liaising and co-ordinating with Atkins Realis to reduce the risk of conflict or nugatory work.

4.9 **Programme milestones.** Based on progress to date and current forecasting, the project milestones within the programme are in **Table 3**.

| Milestone | Completion date | Days of contingency included in each step |
|----------------------------|------------------------|--|
| Project approval | 01/04/2024 | 5 |
| Designs initiated | 01/04/2024 | 10 |
| Detailed designs completed | 01/09/2024 | 10 |
| Invitation to tender | 01/01/2025 | 20 |
| Tender processes complete | 01/04/2025 | 20 |
| Orders placed | 01/05/2025 | 20 |

| | | |
|---------------------------|------------|-----------|
| Works in progress on site | 01/06/2025 | 30 |
| Completed on site | 01/01/2026 | 60 |
| Final commissioning | 31/03/2026 | 60 |
| Completion date | 31/03/2026 | Total 235 |

Table 3 – Combined PSDS / RBFRS Sustainability Programme Milestones.

4.9 **Contingency days.** The contingency days in Table 3 are not consecutive as several elements of the project run in parallel with a view to maximising concurrent activity and reducing programme risk.

5. **NEXT STEPS**

- 5.1 The programme team will formally stand up with a pre-start meeting week commencing the 08 April 2024. A key outcome of the meeting is to finalise the project delivery structure and ensure RBFRS will meet the targets as set out in the milestone breakdown, whilst achieving a high level of monitoring and reporting assurance.
- 5.2 Year 1 of the programme focuses primarily on design and planning to reach RIBA Stage 4 by the end of August 2024. Key stakeholders will be updated on progress directly by written reports and via the RBFRS Estate Development Group and the member's non-executive Estate Development and Sustainability Working Group.
- 5.3 Engagement with the Distribution Network Operator (DNO) is a key component to respective project's success. During the PSDS application process, Atkins Realis submitted early engagement enquiries to the DNO, and this process will be picked back up as a priority following the pre-start meeting. Early engagement is critical to allow time for the DNO to confirm the electrical capacity on our sites and endorse the grid upgrades to facilitate the new heat pumps that are being installed.

6. **CONTRIBUTION TO STRATEGIC COMMITMENTS**

- 6.1 **Commitment 5: Sustainability.** We will ensure that we provide a financially sustainable and environmentally friendly service to our communities.
- 6.2 **Commitment 6: People.** We will support our staff by providing a safe and inclusive environment for them to thrive in, building a diverse organisation that is engaged with, and accessible to, our communities.

7. **FINANCIAL IMPLICATIONS**

- 7.1 PSDS funding amounts to £927,845 while the Authority is contributing £842,155.
- 7.2 The capital expenditure budget, which Members are being asked to approve, is in line with the provision in the SAIF for this programme of works.

8. LEGAL IMPLICATIONS

- 8.1 Appropriate legal advice will be sought on procurement, planning and construction aspects if required.

9. EQUALITY AND DIVERSITY IMPLICATIONS

- 9.1 An equality impact assessment (EIA) will be completed as part of the project process for each site and will be a requirement for any project that requires planning consent.
- 9.2 A key project outcome for the related Langley SAIF project remains to improve the equality of facilities for current and future staff groups.

10. RISK IMPLICATIONS

- 10.1 Early engagement will be conducted with local planning authorities to de-risk planning consent applications. Any delays to the processes will be mitigated as required if the risk matures.
- 10.2 Early engagement will be conducted with the DNO to de-risk critical infrastructure requirements. Any delays to the processes and supply limitations will be mitigated as required if the risk matures.
- 10.3 Despite a high degree of confidence in the planning work with Atkins Realis and Salix, a cost overrun remains marginally possible, particularly when considering a volatile inflationary environment. This will be mitigated by inclusive project management and diligent cost control.

11. SUSTAINABILITY IMPLICATIONS

- 11.1 Sustainability implications are seen as wholly positive with the PSDS grant award and the RBFRS contribution's projects supporting our sustainability agenda. Using the latest technology and design methodology such as effective insulation, low energy lighting and low carbon systems (solar, heat pumps, etc) will reduce our carbon footprint and our energy bills.

12. CONSISTENCY WITH DUTY TO COLLABORATE

- 12.1 Opportunities to collaborate with partners, including other FRS neighbours have been discounted for this programme.
- 12.2 According to the CAPE (Climate Action Plan Explorer)⁵ website that collates UK Council Climate Action Plans in a single database, four of the six constituent councils have declared a climate emergency:

| | |
|---------------------------------------|------------------|
| Reading | 26 February 2019 |
| Royal Borough of Windsor & Maidenhead | 26 June 2019 |
| West Berkshire | 2 July 2019 |

⁵ <https://cape.mysociety.org/>

- 12.3 According to the database, of the remaining two, Bracknell and Slough councils have both adopted Climate Action Plans.

13. PRINCIPAL CONSULTATION

- 13.1 The Chief Fire Officer, Deputy Chief Fire Officer and Head of Finance and Procurement were consulted during the preparation of this report.
- 13.2 The Member for Strategic Assets and the Monitoring Officer were consulted during the preparation of this report.

14. BACKGROUND PAPERS

- 14.1 [Strategic Asset Investment Framework \(rbfrs.co.uk\)](http://rbfrs.co.uk)
- 14.2 [RBFRS Heat Decarbonisation Plan 2023](#)
- 14.3 [Database of council climate action plans](#)

APPENDICES

Appendix 1 – RBFRS Sustainability Programme Additional Context April 2024.
Appendix 2 – Technologies Implemented in Heat Decarbonisation Priority 1 Projects.

CONTACT DETAILS

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Sophie Fox, Capital Projects Sustainability Co-ordinator foxs@rbfrs.co.uk

Appendix 1 – RBFRS Sustainability Programme Additional Context April 2024

A1. As a result of the heat decarbonisation roadmap produced by professional consultants Atkins Realis, RBFRS has developed a 5-year sustainability programme to deliver the initiatives set out in the Fire Authority report dated 09 April 2024.

A2. Projects included within the current wider sustainability programme are as listed below with more detail in **Table A1**:

- Heat decarbonisation priority 1 projects (5 sites)
- LED lighting priority 2 project (6 sites)
- Solar PV priority 2 project (up to 6 sites)
- Heat decarbonisation priority 2 projects (6 sites)

| Station | HDP | Projects to be delivered | Funded by | Timescales |
|------------------------------------|----------|---|---------------|-------------------------------------|
| Ascot | Included | Heat Decarbonisation Priority 2 | RBFRS SAIF | 2026/27 |
| Bracknell | Included | - LED Lighting Priority 2 - Solar PV priority 2 - Heat Decarbonisation Priority 2 | RBFRS SAIF | - 2024/25 - 2025/26 - 2026/27 |
| Caversham Road Main station | Included | LED priority 2 | RBFRS SAIF | 2024/25 |
| Caversham Road (Annexe) | Included | Heat Decarbonisation Priority 1 (See appendix 2 for specifics) | Salix PSDS | 2024-2026 |
| Lambourn | Included | - LED lighting priority 2 - Solar PV Priority 2 | RBFRS SAIF | - 2024//25 - 2025/26 |
| Langley | Included | Heat Decarbonisation Priority 1 (See appendix 2 for specifics) | Salix PSDS | 2024-2026 |
| Maidenhead | Included | Solar PV Priority 2 | RBFRS SAIF | 2025/26 |
| Newbury | Included | Heat Decarbonisation Priority 1 (See appendix 2 for specifics) | Salix PSDS | 2024-2026 |
| Slough | Included | Solar PV Priority 2 | RBFRS SAIF | 2025/26 |
| Whitley Wood | Included | Heat Decarbonisation Priority 1 (See appendix 2 for specifics) | Salix PSDS | 2024-2026 |
| Windsor | Included | LED priority 2 | RBFRS SAIF | 2024/25 |

| Station | HDP | Projects to be delivered | Funded by | Timescales |
|---------------------|-----------------------------|--|---------------|---------------------------------|
| Wokingham Rd | Included | Heat Decarbonisation Priority 1 (See appendix 2 for specifics) | Salix PSDS | 2024-2026 |
| Theale | Not Included – new building | N/a | N/a | N/a |
| Crowthorne | Not Included – new building | N/a | N/a | N/a |
| Hungerford | Not Included – new building | N/a | N/a | N/a |
| Wokingham | Not included | LED Priority 2 | RBFRS SAIF | 2024/25 |
| Mortimer | Not Included | Heat decarbonisation Priority 2 | RBFRS SAIF | 2026/27 |
| HQ | Not included | - LED priority 2 - Solar PV priority 2 - Heat decarbonisation priority 2 | RBFRS SAIF | - 2024/25 - 2025/26 - Tbc |

Table A1.1 – RBFRS Estate Sustainability Programme, Project and Site Breakdown.

A3. There are 6 sites that have not been included in the HDP; Theale, Hungerford and Crowthorne have been built to a high standard with sustainability elements embedded into the design and construction, so they do not require any additional investment yet. Wokingham, Mortimer and HQ did not meet the criteria to be included in the HDP due to their usage and current heating systems but will be included in further surveys and investigations when scoping the rest of the project.

Appendix 2 – Technologies Implemented in Heat Decarbonisation Priority 1 Projects

The five sites that have been identified for the Heat Decarbonisation Priority 1 will all receive a boiler replacement and heating system upgrade to an air source heat pump as per the conditions of the Salix funding grant. The use of an air source heat pump system removes the need for conventional fossil fuel sources.

The projects are being delivered as a ‘whole package’ approach, including additional building fabric and efficiency measures to support the new heating systems' effectiveness as detailed in **Table A2**.

| Building | Technology - Work Type | Energy | Fuel Cost (p/kWh) | Annual kWh Pre-project | Annual kWh Post-project | Annual kWh Savings | % kWh Savings | Estimated Project Cost | Annual Financial Impact | Payback in Years | Annual Direct Carbon Savings (tonnes) | Annual Indirect Carbon Savings (tonnes) |
|-----------------------------|---|-------------|-------------------|------------------------|-------------------------|--------------------|---------------|------------------------|-------------------------|------------------|---------------------------------------|---|
| Wokingham Road Fire Station | Cavity wall insulation | Gas | 8.52 | 101,046 | 75,851 | 25,195 | 25% | £6,550 | £2,147 | 3.05 | 4.60 | |
| Wokingham Road Fire Station | Double glazing with metal or plastic frames | Gas | 8.52 | 75,851 | 73,763 | 2,088 | 3% | £12,520 | £178 | 70.38 | 0.38 | |
| Wokingham Road Fire Station | Roof insulation | Gas | 8.52 | 73,763 | 68,521 | 5,242 | 7% | £11,431 | £447 | 25.59 | 0.96 | |
| Wokingham Road Fire Station | Variable speed drives | Electricity | 26.70 | 42,174 | 40,482 | 1,692 | 4% | £4,130 | £452 | 9.14 | | 0.15 |
| Wokingham Road Fire Station | BEMS - remotely managed | Gas | 8.52 | 68,521 | 61,669 | 6,852 | 10% | £12,000 | £584 | 20.56 | 1.25 | |
| Wokingham Road Fire Station | LED - new fitting | Electricity | 26.70 | 40,482 | 39,063 | 1,419 | 4% | £5,761 | £379 | 15.21 | | 0.06 |
| Wokingham Road Fire Station | Solar PV | Electricity | 26.70 | 39,063 | 26,523 | 12,540 | 32% | £19,200 | £3,348 | 5.73 | | 0.61 |
| Newbury Fire Station | Cavity wall insulation | Gas | 8.52 | 169,013 | 136,475 | 32,538 | 19% | £9,611 | £2,772 | 3.47 | 5.94 | |
| Newbury Fire Station | Double glazing with metal or plastic frames | Gas | 8.52 | 136,475 | 121,609 | 14,866 | 11% | £95,880 | £1,267 | 75.70 | 2.71 | |
| Newbury Fire Station | Roof insulation | Gas | 8.52 | 121,609 | 111,391 | 10,218 | 8% | £23,760 | £871 | 27.29 | 1.87 | |
| Newbury Fire Station | Variable speed drives | Electricity | 26.70 | 86,965 | 84,879 | 2,086 | 2% | £5,093 | £557 | 9.14 | | 0.18 |
| Newbury Fire Station | BEMS - remotely managed | Gas | 8.52 | 111,391 | 100,252 | 11,139 | 10% | £29,946 | £949 | 31.55 | 2.03 | |
| Newbury Fire Station | LED - new fitting | Electricity | 26.70 | 84,879 | 81,691 | 3,188 | 4% | £18,740 | £851 | 22.02 | | 0.14 |
| Newbury Fire Station | Solar PV | Electricity | 26.70 | 81,691 | 56,041 | 25,650 | 31% | £38,400 | £6,849 | 5.61 | | 1.24 |
| Langley Fire Station | Cavity wall insulation | Gas | 8.52 | 185,100 | 166,257 | 18,843 | 10% | £4,583 | £1,605 | 2.85 | 3.44 | |
| Langley Fire Station | Double glazing with metal or plastic frames | Gas | 8.52 | 166,257 | 152,575 | 13,682 | 8% | £76,832 | £1,166 | 65.91 | 2.50 | |
| Langley Fire Station | Roof insulation | Gas | 8.52 | 152,575 | 141,044 | 11,531 | 8% | £23,328 | £982 | 23.74 | 2.11 | |
| Langley Fire Station | Variable speed drives | Electricity | 26.70 | 64,264 | 64,099 | 165 | 0% | £404 | £44 | 9.14 | | 0.01 |
| Langley Fire Station | BEMS - remotely managed | Gas | 8.52 | 141,044 | 126,940 | 14,104 | 10% | £23,994 | £1,202 | 19.97 | 2.57 | |
| Langley Fire Station | LED - new fitting | Electricity | 26.70 | 64,099 | 61,954 | 2,145 | 3% | £8,709 | £573 | 15.21 | | 0.10 |
| Langley Fire Station | Solar PV | Electricity | 26.70 | 61,954 | 36,304 | 25,650 | 41% | £60,600 | £6,849 | 8.85 | | 1.24 |
| Caversham Station Annexe | Cavity wall insulation | Gas | 8.52 | 137,240 | 124,641 | 12,599 | 9% | £3,407 | £1,073 | 3.17 | 2.30 | |
| Caversham Station Annexe | Double glazing with metal or plastic frames | Gas | 8.52 | 124,641 | 123,438 | 1,203 | 1% | £7,736 | £102 | 75.48 | 0.22 | |
| Caversham Station Annexe | Roof insulation | Gas | 8.52 | 123,438 | 123,438 | - | 0% | £0 | £0 | | - | |
| Caversham Station Annexe | Variable speed drives | Electricity | 26.70 | 64,264 | 63,422 | 842 | 1% | £2,056 | £225 | 9.14 | | 0.07 |

| Building | Technology - Work Type | Energy | Fuel Cost (p/kWh) | Annual kWh Pre-project | Annual kWh Post-project | Annual kWh Savings | % kWh Savings | Estimated Project Cost | Annual Financial Impact | Payback in Years | Annual Direct Carbon Savings (tonnes) | Annual Indirect Carbon Savings (tonnes) |
|---------------------------|---|---------------|-------------------|------------------------|-------------------------|--------------------|---------------|------------------------|-------------------------|------------------|---------------------------------------|---|
| Caversham Station Annexe | BEMS - remotely managed | Gas | 8.52 | 123,438 | 111,094 | 12,344 | 10% | £11,966 | £1,052 | 11.38 | 2.25 | |
| Caversham Station Annexe | LED - new fitting | Electricity | 26.70 | 63,422 | 62,360 | 1,062 | 2% | £4,310 | £283 | 15.21 | | 0.05 |
| Caversham Station Annexe | Solar PV | Electricity | 26.70 | 62,360 | 47,530 | 14,830 | 24% | £22,200 | £3,960 | 5.61 | | 0.72 |
| Whitley Wood Fire Station | Cavity wall insulation | Gas | 8.52 | 134,478 | 115,352 | 19,126 | 14% | £5,043 | £1,630 | 3.09 | 3.49 | |
| Whitley Wood Fire Station | Double glazing with metal or plastic frames | Gas | 8.52 | 115,352 | 99,926 | 15,426 | 13% | £38,640 | £1,314 | 29.40 | 2.82 | |
| Whitley Wood Fire Station | Roof insulation | Gas | 8.52 | 99,926 | 99,926 | - | 0% | £0 | £0 | | - | |
| Whitley Wood Fire Station | Variable speed drives | Electricity | 26.70 | 280,072 | 276,638 | 3,434 | 1% | £8,385 | £917 | 9.14 | | 0.30 |
| Whitley Wood Fire Station | BEMS - remotely managed | Gas | 8.52 | 99,926 | 89,934 | 9,993 | 10% | £23,932 | £851 | 28.11 | 1.82 | |
| Whitley Wood Fire Station | LED - new fitting | Electricity | 26.70 | 276,638 | 275,364 | 1,274 | 0% | £5,172 | £340 | 15.21 | | 0.06 |
| Whitley Wood Fire Station | Solar PV | Electricity | 26.70 | 275,364 | 219,434 | 55,930 | 20% | £83,400 | £14,933 | 5.58 | | 2.71 |
| | | Totals | 525.9 | 4,048,775 | 3,659,880 | 388,896 | NA | £707,719* | £60,752 | NA | 43.26 | 7.64 |

* **Note** – the estimated project costs were indicative and accurate at the time of the application and there might slight discrepancies in totals due to rounding up or down.

Table A2.1 – Building fabric and efficiency measures.

| Site Name | Technology - Work Type | Make | Model | Heating Solution Configuration | System to Supply Space Heating, DHW or Both | Heating Emitter Type | Heating Equipment, Installation, and Commissioning £ | Additional Measures £ e.g. Emitters, Distribution £ | Electrical Infrastructure £ | Total Cost of Low Carbon Heating Measure ¹ |
|--------------------------------|-------------------------------------|------------|-----------------|--------------------------------|---|----------------------|--|---|-----------------------------|---|
| Wokingham Road Fire station | Air source heat pump (air to water) | Mitsubishi | CAHV-R450YA-HPB | Standalone | Space Heating and DHW | Radiators | £97,836 | £19,250 | £24,500 | £141,586 |
| Newbury Fire Station | Air source heat pump (air to water) | Mitsubishi | CAHV-R450YA-HPB | Standalone | Space Heating and DHW | Radiators | £195,000 | £35,150 | £42,000 | £272,150 |
| Langley Fire Station | Air source heat pump (air to water) | Mitsubishi | CAHV-R450YA-HPB | Standalone | Space Heating and DHW | Radiators | £140,000 | £35,816 | £31,500 | £207,316 |
| Caversham Road Annexe Building | Air source heat pump (air to water) | Mitsubishi | CAHV-R450YA-HPB | Standalone | Space Heating and DHW | Radiators | £94,000 | £19,184 | £21,000 | £134,184 |
| Whitley Wood Fire Station | Air source heat pump (air to water) | Mitsubishi | CAHV-R450YA-HPB | Standalone | Space Heating and DHW | Radiators | £151,250 | £18,920 | £31,500 | £201,670 |
| | | | | | | Totals | £678,086 | £128,320 | £150,500 | £956,906² |

* **Notes:**

1. Whilst the same ASHP models are being used, the total system costs vary considerably per site due to the enabling works required.
2. The estimated project costs were indicative and accurate at the time of the application and there might slight discrepancies in totals due to rounding up or down.
3. Direct carbon savings for ASHP is circa 80 - 90t CO₂e per year, so total carbon savings expected to be in the region of 130t CO₂e.

Table A2.2 – Heating systems upgrades.