

Housing

Briefing Note



City of Westminster

Subject: Introduction to Westminster's Sustainability Retrofitting Programme – Policy & Scrutiny Committee

Date: 18th May 2023

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Introduction to Westminster's Sustainability Retrofitting programme.

Purpose of Briefing Note:

1.01 This briefing note provides:

- Short Background to retrofitting and Council objectives.
- A summary of the progress the council has made retrofitting its stock in order to meet its objective to get its homes to a Net Zero standard by 2040, including cost of programme.
- Success of the Energy Saving Show Home & future plans.
- Opportunities and Risks
- Next Steps

Background:

1.01 In this note, Retrofit broadly refers to any improvement work on an existing home to improve its energy efficiency, making it easier to heat, able to retain that heat for longer, and replacing fossil fuel use with renewable energy.

1.02 The Council declared a climate emergency in 2019 and set a target to reduce city-wide emissions to net zero by 2040. The Climate Emergency Action Plan (CEAP) adopted in November 2021 sets out nearly 70 council-led actions to support delivery of this target. This target was re-affirmed in the Council's Fairer Westminster Strategy in 2022.

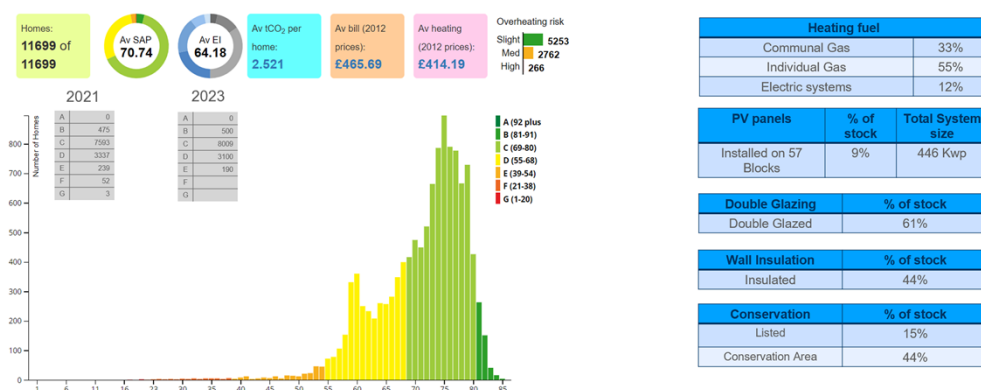
1.03 Extract from Fairer Westminster Action plan 2023/24 highlighting main areas of focus for retrofitting the council's Social Homes:

- Work to improve the Pimlico District Heating Undertaking's performance and reduce its carbon footprint.
- Renovate council homes to help lower our tenants' energy bills, improve their homes' energy efficiency, and reduce carbon emissions.
- Continue the journey of switching to sustainable heat sources across our Council buildings and housing stock.

Council retrofitting Progress:

- 1.04 Recruitment of the Sustainability Team tasked to deliver a net zero programme of works began in 2022 and almost completed with 7 posts filled. An Environmental Programme Manager has been advertised in May 2023 and 2 sustainability officers to be advertised in June 2023.
- 1.05 In 2020 through to 2021 the Council worked with its London Council colleagues and created a pan London retrofit action plan in July 2021. The Plan was agreed by the Director of Housing and Cabinet Member (CM) for Housing in September 2021. This is attached as **appendix 1**. The Plan can be summarised as reduce heating demand and then electrify heating via ‘whole home’ retrofits – installing additional insulation (inc. windows) / low carbon heating / energy generation.
- 1.06 The definition of Net Zero in the context of retrofitting has been defined as:
1. Essential - Home is heated by non-fossil fuel source.
 2. Desirable – As per the Pan London agreed action plan, we have aimed for a ‘sweet spot’ in terms of a space heating demand of 65 kWhr/m2.yr on average as a way of optimising risk and cost. It is envisaged there will be a range of between 20-120 kWhr/m2/yr (depending on the building type and its retrofit constraints) within which homes should be encouraged to go as far as possible while avoiding technical risks.
- 1.07 During 2021 the Council implemented a full SAP (Standard Assessment Procedure) modelling tool to benchmark our current position on Carbon Emissions, SAP ratings, progress to Net Zero etc for the c.11,700 Council managed social homes. The results of this modelling are shown below:

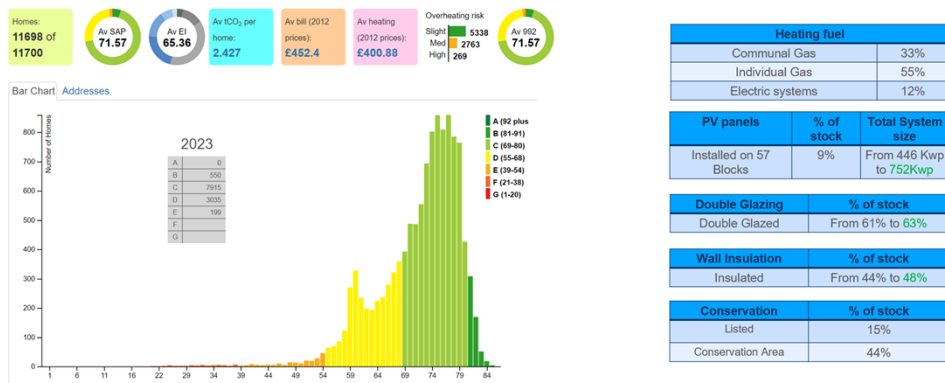
Housing Carbon and Energy efficiency modelling results 2021



- 1.08 Retrofit assessments and works are now completed on all voids to bring homes up to at least an EPC (Energy Performance Certificate) C but with the aim to bring them up as close to EPC B as practical.

- 1.09 £3.3m SHDF (Social Housing Decarbonisation Fund) Wave 1 funding and £800k of Local Authority Delivered (LAD) green homes grant funding secured to help fund a £7m retrofit programme which has delivered over 400 retrofits in the last 12 months and over 500 since start of programme in 2021. Savings to resident's fuel bills from these works are estimated to be £65,000 per year. (Circa £150 per home based on pre-energy crisis costs) and over 250 tonnes of carbon a year. Measures being installed are primarily fabric improvements such as wall, floor and loft insulation and secondary glazing, with some electric heating systems.
- 1.10 Wave 2.1 funding bid of £4.8m received to fund a programme of over £9.6m to retrofit 560 homes to start in Summer 2023 and finish in September 2025. Outcomes of this programme are estimated to be over £90,000 of total savings to resident's fuel bills per year and over 380 tonnes of carbon per year. Measures being installed are primarily Fabric improvements such as wall, floor and loft insulation and secondary Glazing, with some electric heating systems and Solar PV installations. Approx 45% of these homes will come from void properties.
- 1.11 Modelling following retrofit works:

Housing Carbon and Energy efficiency modelling results 2023



Total carbon produced by WCC managed social rented stock is just under **29,500 pa**

1.12 As well as producing these current performance measurements, the parity projects full SAP modelling tool was able to create a programme to get as close to a SAP B as possible and then a Net Zero standard. This work projected a cost of over £213m and assumed 100% take-up of measures from Residents. Some sensitivities were run on this programme to model if 70% and 50% take-up was achieved. These results are shown in Appendix 2.

A breakdown of the £213m cost is shown below:

Efficient Buildings

Measure	No.	*Est Cost
Entrance Doors	4,000	£8m
Floor insulation	3,000	£10m
Windows (not incl planned replacements)	3,000	£15m
Draught proofing	3,500	£3m
Roof insulation		£1m
Wall insulation	6,000	£66m
Total		£103m

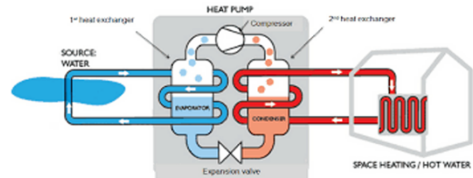


*Based on previous costs for similar works

Retrofitting to PAS 2035 (new retrofit standard) will cost more

Clean & affordable energy

Measure	No.	*Est Cost
Heating Controls	4,200	£4m
Heat pumps/electric heating	7,000	£50m
Communal heating (reduced Gas)	3,000+	£40m
PV panels		£15m
Total		£109m



*Based on limited previous costs for similar works

Many unknown variables:

- are existing radiators large enough?
- is there space for heat pump?
- Will resident accept the heating changes?
- Will planning permission be given?



- 1.13 It should be noted that there is a reasonable level of confidence in the costs for fabric improvements (listed under Efficient Homes) as we have been completed these works for a number of years, however the clean & affordable energy costs are much more difficult to estimate as emerging technologies are required as part of our programme to electric our heating and we have many additional challenges due to the nature of WCC (Westminster City Council) homes. i.e., Heritage, limited space, build form.
- 1.14 Full scale roll out of electric heating has several challenges that need to be overcome, including:
- Electricity prices are 3 times the cost of Gas currently. 12 months ago this was up to 5 times. To ensure our residents are not paying more for heating a system that is currently 3 times more efficient than individual gas boilers is required. Heat pumps are the primary solution that claims to achieve this, however as the Councils social homes are primarily flats with limited external areas available for such systems, it is not likely to be feasible to install in many homes.
 - Consultation required with residents to find suitable solutions that residents will be comfortable using and we need their support to allow this change.
 - Feasibility studies required on 50 Communal heating systems.
 - Heritage consultation required in up to 50% of homes.
 - Modern technologies (i.e., infra-red heating) are yet to be adopted in approved energy modelling systems (such as SAP used in EPCS).
 - Unless a heat pump is used the EPC score will get significantly worse.
 - Skill shortage in maintaining these systems.

Over 20 pilots of electrical heating installations have been completed. The installations include an Air Source Heat Pump, electric boilers, and High Retention Storage Heaters. Further pilots of Infra heating systems and other storage heater solutions are planned. The goal of these pilots is to understand energy cost, ease of use and install cost.

- 1.15 Presentations and workshops have been held with stake holders including London Councils, GLA (Greater London Authority), WAES (Westminster Adult Education Service), DESNEZ (formerly BEIS (Business, Energy, and Industrial Strategy)), thinktanks, Contractors (WCC and others) to explore solutions to the skills shortage in retrofit.
- 1.16 Client briefs and project signoffs now include the Head of Sustainability and Major works are now assessed for opportunities to include retrofit or other sustainability works at the concept stage of project development. A assessment of current Major works projects was completed and any projects that were not too far progressed were assessed and works added.
- 1.17 An example of retrofit work being included in a major works project is in Avenue Gardens – 200kwp of Solar PV to be integrated with the existing major works scheme to replace roofs on the Estate.

- 1.18 The picture below shows the PV panels recently completed on the Warwick Estate. The total number of Solar Panels totals 306Kwp and is likely to be the largest roof top installation of Solar PV in a single Social Housing Estate. The scheme alone has increased the Solar Capacity on our Social Homes by 70% (306Kwp added to 446Kwp).



- 1.19 All new roof replacement schemes now include an assessment for the potential to include Solar PV panels.
- 1.20 PDHU (Pimlico District Heating undertaking) serves over 3,300 homes and 50 commercial units. A review of improving this system is underway, a strategic outline case has been approved to develop a outline business case for investment to secure its future. Opportunity will be taken to investigate low carbon sources such as a water source heat pump utilising water from the Thames.
- 1.21 Similar options appraisals for low carbon heating sources are being undertaken when our other 50+ communal heating systems are due for replacement.
- 1.22 Oldbury House and Sheringham House are being studied to investigate alternatives to heating via individual gas boilers and will inform a larger programme of feasibility studies.
- 1.23 Engagement with local Cllrs has improved resident take up in areas with high proportions of low EPC homes such as the North Westminster Area. Articles in Ward Cllr's communications and local parish council involvement led to a number of resident referrals. In addition, moving from a contractor led communication strategy to an initial WCC officer led approach using the new resources in the sustainability team improved resident uptake from Circa 20% to 45%. Primary reasons for refusing works are disruption to the residents home and loss of wall space due to the internal wall insulation (up to 10cm on external facing wall).

- 1.24 A resident focus group is being recruited that will help improve tenant engagement strategies and selection of suitable retrofit technologies.

Energy Saving Show Home (ESSH)

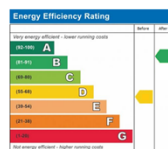
- 1.25 The ESSH in Bravington Road opened in 2022 and was used to show residents measures we will install to encourage uptake. Climate emergency team helped to take this further, and we hosted tours for private landlords and other Councils to share learning. Won a NHMF (National Housing Maintenance Forum) Award and has been shortlisted for the unlock Net zero awards at the National Housing Conference.

Retrofitted one-bedroom void unit

Energy-saving measures on display include:

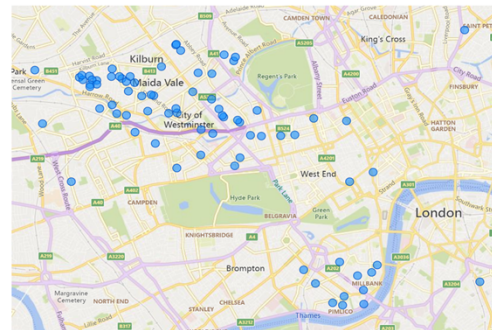
- Internal wall and underfloor insulation
- Thermally-efficient windows and doors
- Replacing gas boilers with energy-efficient air source heat pumps
- Changing gas cookers to induction hobs, eliminating gas use at the property
- Powering the home with solar panels on the roof

- ✓ Energy demand for heating reduced by 55%
- ✓ EPC rating increased from low D to high B
- ✓ Expected to be self-sufficient for energy



Over 300 visitors

- 118 on public tours, 45 x 1:1 tours for WCC tenants, 120 WCC staff/ contractors and 20 from other boroughs.
- Public tours well attended by owner occupiers (73%) and residents from the north of the borough:



Positive feedback and insight

- Average 4.5 out of 5 rating
- Attendees are now more likely to insulate, undertake window improvements, install solar PV.
- Attendees included other councils, WCC tenants, leaseholders, private tenants, HAs, WCC employees.
- High demand for additional advice & support:
 - Clearer information on planning requirements
 - Trusted advice (home surveys and bespoke retrofit plans)
 - Trusted suppliers
 - Financial support
- Legacy: video and PDF case study
- Next steps:
 - Let property and undertake 12 month monitoring
 - Planning for a future show home in South/Central Westminster



"It was enormously helpful - in 10 minutes I could see and understand the improvements and the technology, which would have taken me several hours of research on the internet." **Susan, Little Venice resident**

- 1.26 A video of the ESSH has been created which will allow residents to learn about the retrofit measures being installed and considered by the Council online. A case study has also been produced to ensure the lessons learnt are kept and available.
- 1.27 A second ESSH is being considered in the Central and South areas which will showcase and explore different types of retrofit measures, such as infra-red heating and new insulation systems.

Risks and Opportunities

1.28

Risk/opportunity	Details	Action
Resident take up and leaseholder recharge	Decent homes - take up - circa 75%. Internal wall insulation take up - circa. 20%.	Resident engagement strategy, cost benefit analysis & Grants
Measures not performing as expected	Example is Air source heat pumps – currently no retrofitted heat pumps in stock.	Feasibilities and Pilots
Existing radiators not compatible.	Existing radiators may being compatible with Heat pumps and require replacement.	Feasibilities and Pilots
Measures not being possible/practical or large variance in cost V Budget	It is likely some studies of PV, double & triple glazed windows, particularly in Listed buildings will prove unviable.	Update Modelling and stakeholder engagement
Changes to SAP	Future adjustments will be made to SAP.	Subscribe to relevant organisations and remodel as required
New technology	New technology may be accepted by SAP in the future that is more viable/effective.	
Regeneration	Regeneration could save expenditure and improve carbon reduction if new build standard is high enough.	In hand with development Team
Fuel Bills increasing	Electrically heated properties have the potential to have higher running costs if not used effectively.	Resident engagement, Training, monitoring devices.
Very diverse number of archetypes	WCC use almost 400 beacons to value our housing stock, this gives an idea of the amount of studies and pilots that could be necessary	Consultant support
Lease and heat provisions	If communal heating system cannot be retrofitted sufficiently, moving to individual systems would require variations to leases.	Review following communal system feasibilities

Next Steps

1.29

Description	Benefits to residents and the Council	Target delivery date
Produce and then publish a programme for each WCC managed block	Residents will know what the road map to net zero is for their home	April 2024
Build upon the modelling that details what is required to get to a Net Zero standard and produce a forecast programme to achieve Net Zero by 2040	Stakeholders will be aware of challenges and future plans the Councils has to achieve Net Zero and better equipped to respond to new challenges.	Mar 2024
Work with resident focus groups to shape resident engagement and plan to help achieve Net Zero	Increased take up of measures, better cost of living outcomes for residents and lower carbon emissions.	Oct 2023
Produce an outline decarbonisation plan for WCC's 50+ communal systems and complete appraisals for the systems requiring replacement in the next 5 years.	Council will be able to forecast what carbon emissions are likely to require offsetting and how this will be achieved. Major works can be delivered quicker if low carbon solution already identified before system requires replacement.	Mar 2024

Complete a Photo Voltaic (PV) strategy and assessment of rooftop potential on social housing and explore innovative partnerships/ technologies to get best use of expanding solar capacity.	Better economic returns on investment allowing increased spend on renewables.	Mar 2024
Assess ever new major works programme for retrofit work opportunities.	Less disruption for residents in their homes.	On going
Produce a policy document that sets out the Council's approach to getting its social homes to a Net Zero Standard.	Residents & stakeholders will be better informed of Council policy in this area and be able to provide constructive criticism as well as direct support. Government agencies could use this to lobby for changes that could accelerate delivery.	Sept 2023
Complete further pilots of non-fossil fuel heating systems, review, learn and then consult with resident groups on findings.	Data on more solutions can ensure the right systems are chosen for install and residents are not left in a worse position than current situation.	Ongoing
Deliver a second Show home in Central Westminster.	More residents can find out what measures they can install in their homes when retrofitting.	October 2023
Start consultation on an estate wide heritage agreement in order to complete Retrofit measures in some listed estates.	When listed homes become vacant, retrofit measures could be installed in good time, rather than wait for consent to be provided.	Mar 2024

Appendix 1.

London Councils agreed Retrofit Action plan.

Attached separately due to size.

Appendix 2.

Investment requirements & outcomes & sensitivities on resident take up.

Investment outcomes:

Balanced CASE Min SAP B - zero carbon

Homes Affected Missing Target: 11,048 🏠

	Homes Affected	Homes Considered	Complete Stock
Homes	11698 🏠	11699 🏠	11699 🏠
Mean SAP	79.10 C (+8.11)	79.10 C (+8.11)	79.10 C (+8.11)
Mean EI	82.10 B (+17.57)	82.10 B (+17.57)	82.10 B (+17.57)
Mean Fuel Bills	£335.97 (-125.94)	£335.97 (-125.930)	£335.97 (-125.93)
Mean Fuel Bill (realistic)	£388.1 (-105.59)	£388.09 (-105.58)	£388.09 (-105.58)
Mean tCO ₂	1.228 (-1.265)	1.228 (-1.265)	1.228 (-1.265)
Mean 2017 tCO ₂	0.859 (-1.058)	0.859 (-1.058)	0.859 (-1.058)
Mean 2019 tCO ₂	0.588 (-1.235)	0.588 (-1.235)	0.588 (-1.235)
Mean 2025 tCO ₂	0.286 (-1.353)	0.285 (-1.353)	0.285 (-1.353)
Mean 2030 tCO ₂	0.241 (-1.380)	0.241 (-1.380)	0.241 (-1.380)
Mean 2038 tCO ₂	0.157 (-1.430)	0.157 (-1.430)	0.157 (-1.430)
Mean 2050 tCO ₂	0.131 (-1.446)	0.130 (-1.446)	0.130 (-1.446)
Mean Heating Bill	£296.99 (-113.40)	£296.99 (-113.40)	£296.99 (-113.40)
Mean TThreshold	21.76°C (slight) (+0.51)	21.76°C (slight) (+0.51)	21.76°C (slight) (+0.51)
Mean kWh per M2	53.87 (-88.500)	53.87 (-88.490)	53.87 (-88.490)
kWh	2,867.47 (-5004.290)	2,867.23 (-5003.860)	2,867.23 (-5003.860)



Sensitivities

Minimum SAP B then Zero Carbon

Estimates	Takeup			Change from 2021		
	100%	70%	50%	100%	70%	50%
Mean SAP	83	79.3	76.9	12.3	8.6	6.1
Meant EI	85	78.8	74.6	20.8	14.6	10.4
tCo ₂	0.8	1.3	1.7	-1.8	-1.2	-0.9
tCo ₂ total	9,360	15,503	19,598	N/A	N/A	N/A
2038 tCo ₂	0.2	0.7	1.0	-1.6	-1.1	-0.8
2038 tCo ₂ total	2,340	7,921	11,642	-92.2%	-73.6%	-61.2%
2050 tCo ₂ total	1,500	5,550	11,385	-95.0%	-81.5%	-62.1%