

Low Carbon Retrofit Delivery Plan 2022-2028

December 2022

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1. Introduction

The Council's c5,700 homes are estimated to account for nearly one third of SWTs own carbon footprint. Our modelling predicts that an investment of £135m will achieve zero carbon by 2050 through a fabric first approach (insulation) and then switching fuel from fossil fuel to electric heating systems. The Council has identified £9m-£12m investment through the HRA over the next seven years although if it is successful in partnerships which provide grant the investment over the same period of time is c£31-£57m, see section 2b.

The strategy identified five delivery principles which should be progressed to achieve zero carbon.

- Alignment of decent homes programme and retrofit
- Maximise subsidy and grant
- Ensure good quality data influences decisions
- Tenants at the heart of zero carbon
- A no regrets approach

The critical consideration in the delivery of zero carbon retrofit is the additional financial pressures place on the Housing Revenue Account (HRA). The HRA of the Council is ring fenced and its income comes from tenants' rents. The HRA has limited opportunities to increase its income and there are many pressures on expenditure. The HRA business plan has very limited capacity to manage the scale of investment identified in the strategy whilst keeping within good financial parameters.

Most Council rents are set at a 'social rent' which uses a formula that typically sets social rents between 50% and 60% of market rent. SWT for new build homes has recently set rents at 'affordable rent' levels which is around 80% of market rent. These properties generate more income for the HRA which compensates to a greater degree for the additional costs of building zero carbon homes. The Council cannot switch social rented homes to affordable rented homes to increase income.

The environment social landlords operate within, including the Council, continues to change. Recently there have been requirements to adopt higher standards in areas such as compliance and fire safety and there is new legislation requiring higher service standards and greater tenant engagement. In addition to new pressures investment in replacement components in an aging stock through its capital programme is essential to maintain homes to the decent home's standard. The service losses c35 homes per year through the Right to Buy and although the council will be increasing its investment in zero carbon measures some homes will be sold with the sale price unlikely to compensate the council for the additional investment. Most business plan commitments are essential to be a good landlord and comply with statute and therefore there are few aspects of spending which are optional and could be curtailed. New build homes in general support the long term HRA business plan especially if 'affordable rents' are applied and where demolition is not required.

The cost of achieving zero carbon for the c5700 homes is estimated at £135m by 2050 which is an average of £23,700 per property. With little opportunity to create new income the HRA will need to be very efficient in managing its business. The general fund is legally able to provide financial support to the HRA to deliver the council zero carbon ambition or deliver works at a faster pace. However, it is assumed this

opportunity is remote as the general fund has many calls on its income. The recommended solutions to delivering zero carbon retrofit is to apply the five key delivery principles. Embracing these principles will be challenging and require commitment and capacity.

This delivery plan is not set in stone and will be reviewed annually as more is understood about our homes, grants evolve, new technologies develop and the council grows in confidence at delivering zero carbon retrofit. There are many challenges and risks and the strategy is extremely ambitious in its targets in particular the lowering of heat demand to c50kWh/m²/yr. Nonetheless the opportunity to move towards zero carbon at a faster pace than many landlords exists for SWT and the service is seeking to embrace the change required.

2. The Five Key Delivery Principles

a) Alignment of decent homes and retrofit programmes

Through aligning programmes the service will deliver low carbon measures through existing business plan funding. In addition, this existing funding acts as match funding for grant applications. The specifications of Decent Homes items such as windows, doors, insulation, roofs, boilers and ventilation would be varied to reflect the low carbon pathway requirement of homes. In addition, a “no regrets” approach would be progressed through the use of PAS 2035 standards and pathways reducing the risk of replacing components before their decent home’s life expectancy has ended. This approach allows existing budgets to be maximised in the pursuit of retrofit as well as decency.

The decent homes capital programmes has c£50m investment identified over the next five years in the HRAs Medium Term Financial Plan (MTFP) and the business plan allocates decent homes funding throughout the 30 year business plan. Some spending will be required on essential component replacement of items unrelated to retrofit such as kitchens and bathroom but the majority of decent homes components can be specified to contribute to the retrofit strategy. Each year the council approve the HRA capital programme budget. The annual budget round will need to approve the budget and any grant match funding available to the service to deliver on its decent homes, retrofit and new build targets. Delegations of authority to ensure grants can be accessed without lengthy governance requirements will be essential to help submit grant applications. Whilst working to deliver retrofit targets the council must also maintain compliance and stock decency (decent homes standard). To align decent homes and retrofit there is a need to:

- Better define the roles of asset management and capital investment team
- Resource the service in particular the asset management team to ensure data is accurate, surveys to check assumptions and to create specifications, support and capacity for contract procurement
- Recalculation of budget for different decent homes components bringing some items forward and placing some items in later years.

- Create a packaged approach to capital works delivery in place of the single item only approach.

In considering the decent homes capital programme and retrofit programme as one programme asset managers can make decisions which provide a dual purpose. There are a number of components such as windows, doors, ventilation, insulation, lighting, roofing as well as heating systems and controls which could be installed with a specification appropriate for decent homes, compliance and retrofit requirements. In addition, there are a few retrofit works that could be efficiently done when a property is void and between tenancies although these opportunities should be limited due to the diseconomies of scale.

Some components have limited overlap with low carbon retrofit such as kitchens and bathrooms and therefore programmes of replacements can continue generally separate to retrofit investment. It should be noted that as the council's retrofit delivery becomes more advanced even bathrooms and kitchens capital programmes may change to allow greater low carbon benefits for example allowing bungalows with concrete floors to benefit from floor insulation when kitchen and bathrooms are being replaced. However, in the short term the service recognises that the majority of decent homes components such as surveys, roofs, windows, doors, insulation, ventilation and heating systems can be specified differently to provide retrofit as well as decent homes.

Ideally many components would be replaced simultaneously to provide the greatest benefit for the customer and ensure components are designed in a way which are complementary. However, one of the challenges of optimising decent homes and retrofit alignment is the life cycle of components. Components which are replaced before their life cycle due date will cost the HRA business plan more and therefore inflate the investment needs. Table 1 sets out some of the consideration now required to align decent homes and retrofit.

Table 1 – Some considerations when aligning decent homes and low carbon retrofit

Decent Homes components and their potential to contribute to low carbon retrofit		
Component	Decent Homes Life Cycle	Potential contribution
Surveys	N/A	Surveys could capture retrofit benefits as well as stock condition and EPC data. The use of the PAS 2035 approach will be required when requesting government grant/subsidy
Kitchens	20 yrs	The timing of the replacement and plumbing can help ensure external wall insulation is not disturbed or spoilt. Where there are bungalows with concrete floors needing floor insulation the insulation abortive costs will be avoided if delivered simultaneously with kitchen and bathroom replacement.
Bathrooms	30 yrs	
Roofs inc. insulation, rainwater goods, scaffold, pointing	50 year+	External Wall insulation will be an essential requirement for many homes achieving retrofit targets. There may be cost savings by aligning wherever possible roof replacement and external wall insulation as well as windows and doors. However the more components included in a programme the greater the likelihood that components will be replaced before their anticipated life cycle end date. Additional loft insulation up to 400mm will be the standard in pitched roofs and flat roofs will need a higher insulation quality than present. Grant regimes which allow many components to be replaced simultaneously will be enthusiastically explored.
Windows	30 yrs	Increasing the U value of windows from standard building regulations of 1.4 to 1.3, 1.2, 1.1 or 1 will improve efficiency of homes. Many SWT homes have U values of 1.8 due to their age creating an opportunity for improvement. However the replacement of windows where external wall insulation will follow overtime will lead to design challenges and aesthetic problems for example wider frames. Grant regimes which allow many components to be replaced simultaneously will be enthusiastically explored.
External Doors	30 yrs	Increasing the U value of Doors to 1.2 or less will improve efficiency of homes. Many SWT homes have U values of 1.8 due to their age creating an opportunity for improvement. However the replacement of Doors where external wall insulation will follow overtime will lead to design challenges and aesthetic problems for example wider door frames. Grant regimes which allow many components to be replaced simultaneously will be enthusiastically explored.
Insulation	N/A	Significant increased investment in external wall insulation, cavity insulation, replacement cavity insulation, floor and loft insulation will be required to achieve heat demand targets. Grant regimes which allow many components to be replaced simultaneously will be enthusiastically explored.
Ventilation	N/A	pre works surveys and component specification will consider ventilation in significant detail to avoid problems such as damp and mould as homes become better insulated. Some properties will require mechanical ventilation and heat recover and this would be disruptive.
Heating	10-15 yrs	SWT have a well established low energy specification for replacement boilers. This has a significant benefit on a properties EPC rating/ SAP rating. Where a property is well insulated and grants are available fuel switch to Air Source Heat Pumps or quantum heater will be considered. However more homes will see their gas heating renewed as part of cyclical programmes over the next few years and then at their next renewal cycle fuel withc will be more likely.

The service is also seeking to provide a wraparound package of simple works when delivering window and boiler replacement programmes. This 'Fuel Saving Box' will consist of components and one visit installation service. The visit will check against the 'Fuel Saving Checklist' and install if components are not present. The checklist includes:

- Thermostatic radiator valves (TRVs)
- Boiler SMART controls and potentially remote monitoring
- Loft insulation (400mm)
- Simple draught proof measure

- Low energy light bulbs
- Energy powerdowns
- Mechanical ventilation where passive systems are in place
- The package will also provide the customer with a 100 ways to save energy booklet

A new EPC would be carried out shortly after the visit and the council shall develop a means of customers accessing energy performance data on their home.

b) Maximise subsidy and grants

The Council should be enthusiastic and proactive in pursuing relevant subsidy which is often in the form of government grant or energy company obligation. There are and will continue to be for many years a number of grants each set up to achieve benefits for different tenures (Private Sector, Social Housing) or encourage the delivery of different measures (insulation, fabric first, fuel switch, tackle solid wall properties, renewable heat and power, etc). Subsidies keep changing and grant rules will keep changing and therefore it is critical that the HRA has an explicit pathway to zero carbon for each property archetype and form. The housing service will also need the resources to apply and manage multiple grant programmes. To allow access to grant the service requires sufficient delegated authority to allow grant funding to be progressed as the time window and requirements may not fit current approval timescales and increase the risk of bid failure or delivery failure.

However, grants should not be pursued without a clear purpose in mind which means the Council asset management service using software such as open assets and reference to archetype pathways to zero carbon must be able to match opportunities with properties. Currently we see many grants aimed at a fabric, worst first approach and this reflects the current local and nationwide need to reduce the heat demand of homes. It may also be the case that grants come with conditions and contracts. Sometimes the benefits of the grant funding will be significantly offset by the contract conditions especially where the grant does not align to the council's strategic priorities and stock requirements.

Currently the main subsidies for social housing are:

- Social Housing Decarbonisation Fund Wave 1 & 2 . This grant is aimed at worst first homes moving them to EPC C and a heat demand of 90kWh/m²/yr. Wave 2 is significantly less beneficial than Wave 1 as cost caps have been lowered and match funding requirements increased. Wave 1 provided 2/3 grant contribution and a property cap of £10k-£16k. Wave 2 provides a 50% contribution and cost cap of £5k-£10k. With both waves an additional revenue grant of 15% of the grant share can be claimed for both waves. Obviously, the capital grant is a smaller proportion in Wave 2 and therefore more dwellings are required in the bid if the revenue element is to be significant. The service has struggled to deliver Wave 1 outcomes and it is critical that both resources and procedures need to be considered in order to be successful.

ECO4 – Energy company obligation ECO4 is replacing ECO3. This is a 100% grant and can be used to move properties two EPC bands. This will often require

some form of wall insulation plus other fabric and potentially renewable heat measures. The funding is likely to be ideal for solid wall, non traditional and block properties as well as properties which require cavity wall insulation. The service is finalising a £25m neighbourhood ECO4 scheme with E-ON and their contractors. If successful, this may benefit council stock in excess of c£6m-£19m and private rented accommodation by c£5m-£19m. The service has identified the first scheme area which contains significant local authority homes and the contractor is ready to carry out surveys on a second potential scheme area if the contract is completed. The Neighbourhood scheme with E-ON is important to the service as it requires limited capacity from the council who will mainly agree measures and quality checks. The funding is comprehensive and the works will take properties closer to zero carbon than SHDF which has a more limited ambitions.

To illustrate the importance of grant tables 2 summaries the number of units and value of the programme with or without grant based on three delivery plan scenarios. The HRA business plan without grant could invest c£9m and benefit 937 homes over seven years. Within seven years £12m HRA funding could deliver a £31m programme and benefit 2001 homes. Should grant cease after 2026 the HRA would need to invest proportionally more to continue along the pathway to zero carbon. In the third scenario £19m of grant would be supported by £37m of HRA investment and benefit 2701 homes.

Table 2 – HRA investment strategy with grant 2022-2029 (Low)

Comparison of programme with and without grant 2022-2029			
	No Units	Programme Value	% funded by grant
Without Grant (HRA funding only)	937	£9,000,000	0.00%
With Grant and £12m HRA contribution	2001	£31,000,000	60.35%
With Grant and £37m HRA Contribution	2701	£57,100,000	33.68%

Tables 3 and 4 provide two scenarios (high grant low HRA funding scenarios) of the potential investment levels 2022-2029 with grant. The illustrations only include grant funding for the first four years as grants post 2025 are unknown although it is highly likely they will be available.

In table 3 (high grant but low HRA investment scenario) we see how c£31m of decent homes, capital programme, energy company obligation and social housing decarbonisation fund Wave 1 & 2 could deliver retrofit improvement to 2001 units 2022-2029 of which 701 units would have received significant whole house retrofit works in one visit. The service has identified c£18.74m of grant funding for the delivery of works up to 2025. Grant programmes by their design tend not to be know many years in advance and therefore more grants are likely in years 2025-2029. The annual capital programme budget approval, MTFP and 30 year business plan are the mechanisms to be used to ensure funding requests are affordable to the HRA.

Table 3 – HRA investment strategy with grant 2022-2029 (high grant and low HRA investment scenario)

Low Carbon Retrofit Investment scenario 2022-2029 (High grant, low HRA investment)						
		UNITS	SUB TOTAL	GRANT	SWT Cost Total	% of grant
2022	2023	223	£2,269,250	£825,000	£1,444,250	36.4%
2023	2024	517	£8,770,750	£6,520,000	£2,250,750	74.3%
2024	2025	554	£8,799,000	£6,490,000	£2,309,000	73.8%
2025	2026	389	£7,353,000	£4,905,000	£2,448,000	66.7%
2026	2027	109	£1,698,000	£0	£1,698,000	0.0%
2027	2028	109	£1,560,750	£0	£1,560,750	0.0%
2028	2029	100	£600,000	£0	£600,000	0.0%
TOTAL		2001	£31,050,750	£18,740,000	£12,310,750	60.35%
AVE OVER 7 YEARS			£4,435,821	£2,677,143	£1,758,679	

In table 4 (high grant and high HRA investment scenario) we see how c£57m of decent homes, capital programme, energy company obligation and social housing decarbonisation fund Waves 1 & 2 could deliver retrofit improvement to 2701 homes before 2029. The number of homes receiving significant whole house retrofit works in one visit would also be 701 units although 500 more homes would receive at least one new measure. The grant funding would be slightly higher at £19.2m. The table tries to emphasis the importance of grant in delivering the scale of investment required to achieve zero carbon. Although the HRA could continue to align decent homes funding and retrofit it is unable to sustain the pace of change without maximising grant. As in table 3 grant has not been assumed from 2026-2029 although it is likely grant funding will be available for SWT to submit bids.

Table 4 – HRA Investment Strategy with grant 2022-2029 Summary (High grant and high HRA investment scenario)

Low Carbon Retrofit Investment scenario 2022-2029 (High Grant/High HRA investment)						
		UNITS	SUB TOTAL	GRANT	SWT Cost	% of
2022	2023	223	£2,269,250	£825,000	£1,444,250	36.4%
2023	2024	517	£8,770,750	£6,520,000	£2,250,750	74.3%
2024	2025	554	£8,799,000	£6,490,000	£2,309,000	73.8%
2025	2026	489	£11,078,000	£5,405,000	£5,673,000	48.8%
2026	2027	309	£9,148,000	£0	£9,148,000	0.0%
2027	2028	309	£9,010,750	£0	£9,010,750	0.0%
2028	2029	300	£8,050,000	£0	£8,050,000	0.0%
TOTAL		2701	£57,125,750	£19,240,000	£37,885,750	33.68%
AVE OVER 7 YEARS			£8,160,821	£2,748,571	£5,412,250	

c). Ensure good quality data influences decisions

The strategy has outlined the required approach to data collection and analysis. As the Council's Open Assets data base becomes more established and more property data is collected and verified the council will be able to be more sophisticated in aligning its investment and disinvestment. Additional resources are being prioritised over the next few years to ensure our data is robust, validated, and ready to support grant applications and capital programmes. Although the use of the PAS2035 quality assurance process will introduce additional survey and design costs this approach reduces the likelihood of expensive problems such as damp and mould and failure to achieve the expected energy efficiency improvements (performance gap). The strategy is also encouraging the use of SMART controls on boilers and technology to identify underperforming properties early and remotely.

The council's open assets database is populated with our stock condition data which supports the decent homes programme. The retrofit programme and decent homes programme are now coming together as the single capital programme with the aim of timely investment to ensure all SWT homes are achieving the decent homes standard and also achieving the low carbon and zero carbon standards.

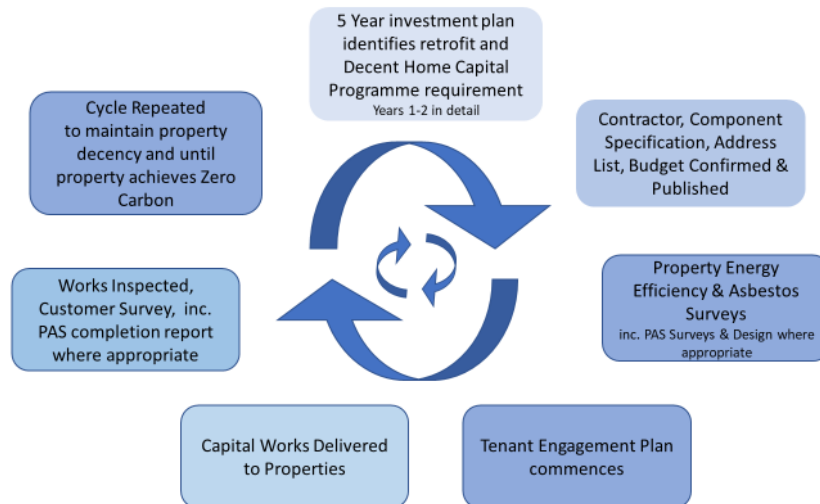
The service has identified a significant budget in its capital programme to carry out appropriate surveys to ensure capital investment can be delivered efficiently and to the appropriate standard.

d) Tenants at the Heart of Zero Carbon

In previous sections of this strategy, it has been emphasised that the tenant must be at the heart of delivering zero carbon. Where the council and customers both see the merits of zero carbon communication and access for deliver teams will be more efficient and tenants will benefit from reduced fuel consumption sooner.

The strategy has emphasised the need to have high levels of customer support and awareness to ensure works can be delivered in homes efficiently. This will require improvements to the current practices including surveying, stock analysis, procurement, communication, engagement, quality of delivery, tenant support including to the most vulnerable, leaseholder engagement and monitoring post works. Diagram 1 presents a picture of perpetual engagement, learning, data refinement, surveying, programme delivery and quality checks. This continuous cycle and joined up approach provides significant efficiency when delivering the landlords ongoing investment.

Diagram 1; Customers are the key to successfully achieving Zero Carbon



It is critical that leaseholders are also engaged early and become aware of the opportunities and potential cost of retrofit works. It is likely that external wall insulation will be one of the opportunities to ensure apartments achieve a low heat demand. The service is aware that leaseholders may have a property asset but may also be on a limited income.

SWT will continue to work with Tenants to agree improvement in communication and the delivery process. As a result of tenants suggestions, the following actions will be progressed:

- Personalise tenant engagement when planning, delivering and evaluating works.
- The production and use of a number of policy statements when procuring contractors or during capital works carried out by SWT or their contractors. These will include; expected standards of tenant engagement to inform a contractor’s tenant engagement plan. a statement on the expected standard of additional support for vulnerable customer during work programmes, a standard approach to collecting customer satisfaction data, a social value statement/requirement. These policies will reflect the need to target the tenant and not the property.
- Work programmes to be designed further in advance to allow the timely promotion of works, ensure a good lead in time for consultation in advance of work, reduce access problems and help align more work programmes and surveys to reduce the number of visits to tenant’s homes
- Build in funding and time to capital programmes to support vulnerable tenants with preparatory works ahead of installation e.g. cleaning lofts and moving furniture.
- The launch of a show house in early spring 2023 to promote low carbon components to tenants, staff, Members and contractors. The show house will include displays and virtual tours of other SWT zero carbon new build and retrofit projects as well as showing materials and technology commonly used in retrofit.
- Identify additional capacity to ensure SWT can prepare and deliver programmes of work in a timely way.

- Set up a leaseholder forum to ensure leaseholders understand the implications of zero carbon for them and the financial contributions they may have to make.
- The development of standardised written information to be used at specific stages of consultation. Ensuring the council is able to explain why things are needed, and who will be doing them and when they will take place.
- A mechanism to ensure the landlord and its contractors can have better customer insight when engaging customers during works by making best use of the data available through our open system.
- Grown skills and the capacity of the Councils workforce to deliver low carbon works.
- Training and support for SWT colleagues to ensure joined up messages during customer contact
- Ensure contract specifications are clear and the council works with contractors to ensure technical information is clear, correct, and easy to understand.
- Include tenant representatives in the selection of smart controls and devices prior to contract award.
- Continue with the Tenants Low Carbon Working Group in order to support tenant retrofit champions and guide officers as we deliver works, agree work programmes, appoint contractors, and engage with other customers.

e). A no regrets approach to zero carbon

A no regrets approach is one where the investment of the council does not lead to unexpected and negative consequences such as damp and mould, unsustainable household fuel costs or the early replacement of retrofit measures due to specifications not being joined up with compliance or decent homes or insufficient foresighted enough.

Landlords conduct EPC surveys as part of the lettings process to ensure incoming tenants are able to be informed of the energy efficiency of their home. EPCs are based on SAP and have traditionally be used as the key measure to understand the stocks energy efficiency. SWT will continue to collect EPC data as this is important to bid for grant and remains a requirement when letting homes. However, the council will turn increasingly towards measuring success by measuring a homes heat demand.

Government and landlords have been concerned about the problems which have arisen as bi-products of inappropriate Decent Homes surveys, works, work specifications, design or components. Issues such as damp and mould or cold bridging are examples of these failings. The service will identify a means of evidencing right first time and no regrets.

To support a 'no regrets' approach SWT will use the PAS2035 assessment and design approach in all projects involving grant and extend this where it is felt the works are sufficiently complex to merit the investment. The service will without many exceptions require contractors to have the TrustMark accreditations which sets standards for works delivery, warranties and quality.

Through the use of the PAS 2035 approach when surveying homes and greater consideration in designing the works the service will reduce problems and pursue a

no regrets approach. This approach should benefit tenants and the service by avoiding issues such as damp and mould pre investment.

A no regrets approach will also have to consider getting financial investment 'Right First Time'. This will mean greater analysis to join up compliance, decent homes and retrofit programmes and option appraisals to consider disposal of properties which will not provide value for money through investment. Although homes are built to last for many years and the council invests in capital programs to maintain them properties do eventually deteriorate with age. Some properties reach a point where the benefit of investment is outweighed by the benefit of demolition. SWT must now consider zero carbon retrofit alongside compliance and decency. The council has experience of needing to demolish homes as retaining homes would not provide quality homes in terms of health or quality of accommodation. It is noted that the demolition and replacement by new build homes has a carbon impact as the carbon already captured in the existing building is lost and the carbon used to build a new home is incurred. Selective disposal of some homes will pass the liability of some of the most expensive properties to the private sector but generate a capital receipt which will strengthen the business plan and in so doing protect investment in new or existing homes. The council's ambition is to grow its housing stock rather than dispose of properties will remain foremost when considering options for investment and disinvestment. Additional investment is the likely outcome for many homes although the extra funding would need to be identified. It is recognised that when disposing of a property the private sector may not invest in retrofit works however legislation and grant funding may be available to the private sector which the social housing sector cannot access.

3. Risks and the challenges of delivering zero carbon retrofit

The strategy and delivery plan recognises that delivering zero carbon retrofit is very complex. National experience has shown good examples of retrofit but also many challenges. A significant number of risks have been identified and appendix 3 of the Strategy contains a comprehensive list of risks and mitigations. In addition, low carbon retrofit is one of the risks within the directorates risk register. Risks tend to fall into the following main themes:

- Zero carbon retrofit could be unaffordable to the HRA business plan
- Failure to collect appropriate data
- Inability to achieve low heat demand for the majority of homes leading to challenges in relation to fuel poverty when switching fuel
- Failure to engage tenants and leaseholders affectively
- Inability to procure contractors
- Failure of the national grid to be decarbonised
- Lack of appropriate grant opportunities

4. Achieving 2040 Targets

Although the investment pre 2030 is moderate the greater challenge is to bring homes up to the 2050 zero carbon standard.

The average cost of bringing SWT homes up to EPC C is £3.2k which is a moderate business plan investment. According to our data SWT has c1300 homes which are in EPC band D (SAP 55-69) but within 0.5 - 6 SAP points of EPC C (SAP 69.5 - 80). Properties receiving a combination of small measures could benefit from 0.5 - 6 SAP points. The service aim to use the following two approaches to move many properties to EPC C:

- A large window replacement programme replacing double glazed windows due for replacement pre 2030 with higher quality double glazed windows which have an improved thermal efficiency standard minimum 1.2U value. Some doors will also be replaced to a higher thermal standard and a wraparound package of small measures called the 'Fuel Saving Box' will be installed where possible.
- A structured boiler replacement programme replacing heating systems with more efficient heating system. The service will also investigate new SMART controls to help customers manage their fuel usage and some technology to help the service remote monitor the house to identify properties not conforming to the expected efficiency. The boiler replacement programme will also receive a wraparound package of small measures called the 'Fuel Saving Box'.

On average homes will cost c£24k to bring to the zero carbon standard. This costs does not include any disruption costs or complementary work such as decanting, refixing of components disturbed during work, early replacement of components before their anticipated failure date or inflation. The council do have some outliers which will cost substantially more such as Woolaways, Cornish and some of the other non-traditional properties as well as pre 1930 stock and solid wall properties. These properties will be the hardest and most expensive to fund and accessing schemes such as ECO4 becomes very important to ensuring affordability to the HRA.

SWT will strive to achieve 50 kWh/m²/yr for all SWT homes by 2040. This will require c£66m of investment in Fabric measures. Around c5000 homes will receive c22,000 fabric measures which are assumed to include:

- £31m Improved wall insulation such as External Wall insulation
- £31m Glazing
- £1.6m Roof insulation
- £1.7m Ventilation including mechanical ventilation
- £100k low energy lighting

The stock will see an increase in the use of external wall insulation. The service will need to invest in software and staff capacity to help analyse retrofit and decent homes data to identify and cost programmes delivering multiple fabric first measures and a whole house approach. Between 2028 and 2040 the alignment of decent homes and retrofit will remain in significant focus as multiple measures delivered simultaneously will reduce costs and reduce tenant disruption. It is likely that to achieve the ambitious heat demand targets some additional measures will be introduced during void works such as floor insulation in particular for bungalows. The decanting of tenants will significantly increase the complexity of the works programme and incur significant costs and complications and therefore most measures identified will be carried out whilst tenants remain in their homes.

5. Measuring progress and KPIs

The service has a Programme Board and a Performance Board. The annual capital programme is reported to the programme Board and this structure will continue to monitor the progress of elements of the capital programme which have a low carbon benefit including boiler replacement, window, door, roof and insulation. In addition, any grant funded programme will be reported through the Programme Board.

The Performance Board will receive updates from the asset management team on progress against KPI target. Proposed KPI targets include:

- Average stock SAP and EPC score (initially from parity software but eventually from SWTs own records, annual or biannual KPI)
- Number of units with an EPC score 69 or less (EPC D, E, F, G) (initially from parity software but eventually from SWTs own records, annual or biannual report)
- Number of units moving from EPC D, E, F, G to C, B or A within quarter/year (initially from parity software but eventually from SWTs own records, annual or biannual report)
- Grant awarded and % of grant claimed
- Average stock Heat Demand (this will be an annual report and will be based on archetype studies and post works surveys)
- Number of units with a heat demand 91 or higher, 90-71, 70-50, 50 or less (this will be an annual report and will be based on archetype studies and post works surveys)
- Number of properties with electric heat and power / Number of units with fossil fuel.
- Number of homes with PV
- Number of homes with Air/Ground Source Heat Pumps
- Number of homes predicted to fall out of decency for each of the next 5 years under agreed MTFP