

ENHANCED BUSINESS CASE

WHOLE HOUSE RETROFIT PILOT

HOUSING TRANSFORMATION PROGRAMME

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1 Section A – General Information

1.1 A1 - Programme Summary

The project will implement an innovative Whole House Retrofit (WHR) Pilot using two retrofit approaches; one to retrofit properties to achieve an Energy Performance Contracting (EPC) 'B+' rating and the second using the [Energiesprong](#)¹ (EPC 'A') approach to deliver carbon reduction for the city, economic growth and reduced energy costs, health and wellbeing benefits to residents.

The full pilot project will deliver WHR to 300 units of BCC social housing stock in East Birmingham; 174 properties to EPC B+ and 126 properties to EPC A (Energiesprong).

The WHR Pilot will retrofit 300 properties in East Birmingham:

- Phase 1 Design: May - August 2022
- Phase 2 Initial Solution Rollout: October 2022 – March 2023; 18² properties
- Phase 3 Wider Solution Rollout: December 2022 – March 2024; 282³ properties
- Phase 4 Monitor and Review Pilot: Jan – March 2024
- Report to Cabinet on Pilot and Recommendations for scaling up to deliver a social housing retrofit programme: March/April 2024.

The Pilot will determine the scope for scaling more widely for BCC's suitable social housing stock c.60,000 properties.

The Pilot presents a bold and innovative opportunity to build on local, regional and national ambitions to reduce carbon emissions, deliver future-proofed retrofit for BCC's 'worst first' properties and address fuel poverty in East Birmingham⁴ through improved performance and reduced energy bills. Critically the project directly advances local and national inclusive growth, levelling up and build back better objectives. Increased inclusivity of growth will be derived from place-based regeneration, focusing on 'worst-first' housing and 'green growth' through growing jobs, skills and the low carbon economy.

1.2 A2 – Programme Scope

The scope of the Whole House Retrofit Pilot is to retrofit and deliver 174 EPC B+ low rise flats using the existing 2022-2024 Capital programme Housing Repairs and Maintenance contractual arrangements with Equans, and 126 EPC A cross wall homes using the Energiesprong solution.

The low rise flats property retrofit will be delivered through engaging the services of BCC's Strategic Housing Repair Partner, (Equans) within the existing capital works CVP⁵ arrangements – managing all elements of the pilot programme under a "one-stop-shop" arrangement. This

¹ Energiesprong is a whole house refurbishment and funding approach for social housing providers.

² 8 low rise flats and 10 cross wall properties

³ 168 low rise flats and 116 cross wall properties

⁴ Fuel poverty is a particular issue in the West Midlands, with 17.5% of households in fuel poverty, the highest of all regions and compared to 13.8% nationally; additionally the combined impacts of Brexit, COVID-19 and recent external market pressures have led to sharp increases in fuel prices, which in turn have led to energy prices increasing, and increased fuel poverty.

⁵ Common Procurement Vocabulary

approach would see the ownership of the design, costing, supply chain engagement, mobilization, resident engagement, delivery handover and post works monitoring being undertaken by Equans..

The cross wall homes property retrofit will be delivered using the Retrofit Accelerator Homes – Innovation Partnership (RAHIP) Framework. The aspiration is that Equans will be appointed as the BCC RAHIP solution provider⁶. As the solution provider, Equans would be responsible for putting in place the supply chain and vendors necessary to deliver all elements from design through tenant engagement and delivery and handover. In addition, Energiesprong will be involved and will be responsible for facilitating access to emerging best practices, technical support, learnings from other pilots and the Collaboration Hub⁷.

⁶ There are four solution providers registered on RAHIP, United Living, Osborne Group, MIDAS Group and Equans. Solution providers are matched to landlords via a carousel procedure. Landlords can provide justification to accept or decline matching.

⁷ Collaboration Hub is a forum comprising all solution providers and landlords, hosted by Turner & Townsend to promote cross pilot learning targeted at driving costs down

2 Section B – Strategic Case

This sets out the case for change and the project's fit to the Council Plan objectives

2.1 B1 - Programme Investment Objectives and Outcomes

Strategic Context

There is an international, national and local strategic imperative to reduce carbon emissions and strenuous effort is being applied at all levels of government to determine how best to achieve net zero targets.

The Climate Change Act 2008 introduced a target for at least a 100% reduction of greenhouse gas emissions (compared to 1990 levels) in the UK by 2050. Domestic energy consumption accounts for about 30% of the UK's total energy budget, and 20% of UK greenhouse gas emissions. Reduction in carbon emissions from domestic properties is essential to achieve the goals of the 2008 Climate Change Act.

On 11 June 2019 the council declared a climate emergency and made the commitment to take action to reduce the city's carbon emissions and limit the climate crisis. The ambition was set for the council and city to become net zero carbon by 2030, or as soon as possible thereafter as a 'just transition' allows – ensuring we reduce inequalities in the city and bring our communities with us. This is the city's 'route to zero'.

On 25 June 2019 the council's Cabinet agreed to add a new priority to the Council Plan which states that Birmingham will be "a city that takes a leading role in tackling climate change". This commitment will embed climate action in the council's decision-making process to make sure that all service areas contribute to the "route to zero" journey.

On 12 January 2021 the Council approved its Route to Zero Action Plan. The document sets out the priority actions for the council in the short and medium term.

Decarbonising Heat – Domestic Properties

The Department for Business Energy Industrial Strategy (BEIS) released the 'Net Zero Strategy' and 'Heat and Buildings' Strategy in October 2021⁸. These Strategies set out how the UK will decarbonise homes and commercial, industrial and public sector buildings, as part of setting a path to net zero by 2050. The Government recognises that to upgrade domestic buildings will require a comprehensive package of measures to be implemented over the next decade. The BEIS 'Ten point plan' to achieve net zero includes plans to:

1. Phase out natural gas boilers by 2035.
2. Reduce the cost of installing heat pumps to ensure they are no more expensive to buy and run than gas boilers by 2035.
3. Improve heat pump technology by investment and research.
4. Ensure affordability by providing financial support to meet capital installation costs.
5. Rebalance prices so that heat pump running costs are no more expensive to install and run than conventional gas fired boilers.
6. Grow the supply chain for heat pumps to 2028.
7. Ensure all new buildings in England will be ready for Net Zero from 2025.

⁸ [Heat and buildings strategy - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/heat-and-buildings-strategy)

8. Phase out the installation of fossil fuel heating systems in properties not currently connected to the gas grid.
9. Grow UK manufactured technology and capabilities.
10. Ensuring the electricity system can accommodate increased demand and heat pumps can be quickly and affordably connected to the network.

The Government's commitment to build back greener is also set out in the Sustainable Warmth & Protecting Vulnerable Households in England Strategy (Feb 2021)⁹ which outlines the updated fuel poverty strategy and sets out plans to:

- Invest a further £60 million to retrofit social housing and £150 million invested in the Home Upgrade Grant, contributing to the manifesto commitment to a £2.5 billion Home Upgrade Grant (HUG) over this Parliament.
- Invest in energy efficiency of households through the £2 billion Green Homes Grant (GHG), including up to £10,000 per low income household to install energy efficient and low carbon heating measures in their homes.
- Expand the Energy Company Obligation (ECO), a requirement for larger domestic energy suppliers to install heating, insulation or other energy efficiency measures in the homes of people who are low income and vulnerable or fuel poor. The scheme will be increased from £640m p.a. to £1bn p.a.
- Extend the Warm Home Discount a requirement for energy companies to provide a £140 rebate on the energy bill of low-income pensioners and other low income households with high energy bills, ensuring continuity for vulnerable or fuel poor consumers.
- Drive over £10 billion of investment in energy efficiency through regulatory obligations in the Private Rented Sector, and
- To lead the way in improved energy efficiency standards through the Future Homes Standard, and the Decent Homes Standard.

There are currently a number of housing policy and standards under review to support the Government's intention to move towards Net Zero:

- The Decent Homes Standard - The Charter for Social Housing Residents: Social Housing White Paper published on 17 November 2020 announced a review of the Decent Homes Standard to understand if it is right for the social housing sector today. The review will be conducted in two parts. Part 1 will run from Spring to Autumn 2021 and will seek to understand the case for change to criteria within the Decent Homes Standard. If the case for change is made, Part 2 will run from Autumn 2021 to Summer 2022 and will consider how decency should be defined.

The Department for Levelling Up Housing and Communities (DLUHC) anticipates the main outcome will be a refreshed Decent Homes Standard. It is widely understood that the minimum requirements for energy efficiency will be revised in support of a target minimum EPC 'C' rating by 2035.

- Energy Efficiency (Private Rented Property) (England and Wales) Regulations 2015 – These regulations are the minimum energy efficiency standard for private rented sector landlords. The consultation closed in December 2020. There is an express intention that all private homes meet EPC 'C' rating by 2025 for new tenancies and for all homes by 2028.

⁹ [Sustainable warmth: protecting vulnerable households in England - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/sustainable-warmth-protecting-vulnerable-households-in-england)

City Housing Vision & Whole House Retrofit

City Housing wants to become “best in class”; to provide a responsive and sustainable service that is relentlessly reliable and builds trust by placing tenants and residents at the centre of what it does and by offering excellent customer service, ensuring tenant’s homes meet their needs and standards for now and the future.

A ‘whole-house’ retrofit is a set of interventions aimed at ensuring that a property operates in as energy-efficient a manner as possible, with all aspects of the building complementing each other in order to be as close to carbon-neutral as possible. In addition the potential wider economic opportunity is significant as the scale of retrofitting the council’s social housing stock is large. Investing in a programme of works provides a significant local skills and employment opportunity as part of a growing ‘green economy’.

BCC is one of the largest landlords in the UK. It is responsible for 15% of the total housing stock in the city, some 60,000 homes, with a mix of high- and low-rise flats, detached, semi-detached and terrace properties. BCC needs to improve the thermal efficiency of its housing stock to reduce carbon emissions, reduce energy bills, improve the quality and experience of residents and support a just transition to a zero carbon city.

BCC’s historic housing stock is a large net contributor to the city’s carbon emissions. The BEIS ‘City Decarbonisation of Heat-Delivery’, September 2020 reports that heat greenhouse gas emissions (GHG) account for c.48% (2,034 ktCO₂e) of the council’s total annual emissions (4,251 ktCO₂e), and that domestic properties account for 57% of heat emissions with an annual GHG footprint of c.1,159 ktCO₂e. Tackling these heat emissions and achieving a ‘net zero’ position is key to BCC achieving its R20 commitment, the aim set for the council and city to become net zero carbon by 2030, or as soon as possible thereafter as a ‘just transition’ allows as .

Place-based, inclusive growth and levelling up in East Birmingham

The project directly supports BCC’s levelling up strategy and inclusive growth objectives. The pilot will be focused in East Birmingham and will support place-based regeneration and development for one of the most deprived areas of the city. A key of element inclusive growth will be the delivery of the net zero transition and the most challenging element will be the delivery of energy efficient homes and low-carbon heating. The delivery of a heat retrofit is hence both a challenge but also an opportunity for regeneration.

East Birmingham is home to more than 230,000 people and forms a crucial part of the City of Birmingham and region’s economy. Major growth is anticipated which will deliver more than 60,000 new jobs and 10,000 homes within and near to East Birmingham over the next ten years. With the coming of HS2 and the proposed Midland Metro East Birmingham to Solihull extension, East Birmingham has significant development opportunities.

East Birmingham is a young place where a third of residents are under 16 years old - one of the highest proportions of children in the country. For many of the citizens of that part of the city there are multiple levels of deprivation and high levels of unemployment. For example, the claimant rate in the Birmingham Hodge Hill constituency is 14.1%, roughly one in seven, the highest rate of any constituency in the UK. As of February 2021, there were 11,045 people searching for a job in Hodge Hill. To support the region’s development, BCC has created the East Birmingham Inclusive Growth Strategy¹⁰.

¹⁰ <https://www.birmingham.gov.uk/ebigs>

The Council presented its 'Prosperity and Opportunity for All': Birmingham City Council's levelling up strategy to Government at the end of November 2021. The Council and its partners in East Birmingham want to work with the Government to define and implement a programme that will accelerate progress to level up East Birmingham by delivering the critical changes needed to tackle inequalities. East Birmingham provides an ideal test bed for developing and delivering successful new approaches to levelling up. It represents a prime opportunity to pilot an integrated programme of transformational interventions so that the lessons can benefit not only the rest of Birmingham but also other parts of the UK. A core principle of the strategy, in common with the East Birmingham Inclusive Growth Strategy, is a focus on linking expected and planned growth with communities to deliver inclusive growth. Five 'levelling up accelerators', including scale housing retrofit, have been identified to use the impetus created by major investments such as HS2 and Birmingham Smithfield to make a real difference.

BCC, Coventry City Council and Wolverhampton City Council have established a Three Cities Retrofit Programme which aims to:

- Accelerate the path to net zero through reduction of housing emissions
- Support the levelling up housing stock and improving standards
- Reduce the costs of housing maintenance and energy use
- Address fuel poverty
- Enable an uplift of skills and developing job opportunities
- Develop an at scale supply chain including manufacturing of kit for the retrofit
- Maximise the benefit of investment to connect with wider policy areas such as digital and energy transformation and EV connections for homes.

The BCC WHR Pilot is directly aligned to and will contribute to the wider three cities alliance.

The investment objectives and outcomes for this project are as follows:

Objectives	Outcomes
To deliver a 300 home Whole House Retrofit (WHR) pilot which supports the reduction of carbon emissions in line with the Council's net zero targets.	Carbon emission savings
To deliver a 300 home WHR pilot which improves and supports the maintenance and future proofing of asset value/stock condition; providing high quality homes that are fit for the future.	300 minimum EPC 'B+' rated homes
To deliver a 300 home WHR pilot which supports work relating to fuel poverty and the negative health effects of energy inefficient dwellings.	Energy savings and bill reduction
To deliver a 300 home WHR pilot which demonstrates an acceptable return on investment in terms of net risk adjusted social value and payback period.	Social value outcomes: <ul style="list-style-type: none"> • More local employment • More local training • No. of apprenticeships
To attract public and private sector inward investment.	£ public sector funding £ private sector funding
To assess two approaches to WHR with reference to CO2 performance, tenant experience and the potential to support scaling across BCC social housing stock.	An assessment of the Pilot and recommendations for scaling

2.2 B2 - Programme Deliverables

Please list expected deliverables / outputs and include any timelines you expect them to be delivered, if not known please use TBC

Deliverable	Expected Timeline
• Report to Cabinet	• July 2022
• Programme team in place	• July 2022
• Phase 1: Solution Design	• August 2022
• Phase 2: Initial Solution Rollout	• October 2022 – March 2023
• Interim Progress Report to Cabinet on Pilot	• March/April 2023
• Phase 3: Wider Solution Rollout	• Dec 2023 – March 2024
• Phase 4: Monitor & Review Pilot	• Jan – March 2024
• Report to Cabinet on Pilot and Recommendations for Scaling	• March/April 2024

2.3 B3 - Programme Benefits

Benefit	Impact	Measure
• 300 minimum EPC 'B+' rated homes	• Reduced CO2e	<ul style="list-style-type: none"> • Reduced Carbon emissions • 174 units EPC B+ • 126 units EPC A
• Reduced fuel poverty	<ul style="list-style-type: none"> • Energy bill reduction per property • Energy savings per property 	• Households lifted out of fuel poverty
• Improved health of social housing residents by removing Housing Health and Safety Rating System (HHSRS) category one hazards.	<ul style="list-style-type: none"> • Reduced #s cold homes & impact on vulnerable residents (e.g. excess cold, damp and mould, slips trips and falls) to provide warm, damp free homes • Reduced sickness days • Improved life chances for children (having a warm home environment has a direct link to higher academic achievement). 	<ul style="list-style-type: none"> • Achievement of performance management targets • # people in fuel poverty assisted with energy efficiency measures • HHSRS¹¹ and, Decent Homes¹² property assessments • # people benefitting from housing retrofit programme • Subjective wellbeing metrics (anxiety, safety, control, happiness, satisfaction etc)

¹¹ [Housing health and safety rating system \(HHSRS\) guidance - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/housing-health-and-safety-rating-system-hhsrs)

¹² [Decent homes programme funding: equality impact assessment - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/decent-homes-programme-funding-equality-impact-assessment)

Benefit	Impact	Measure
<ul style="list-style-type: none"> Socio-economic benefits 	<ul style="list-style-type: none"> Jobs Skills Low Carbon economy 	<ul style="list-style-type: none"> More local employment: # direct/indirect jobs More local training: #s people benefitting from skills training; #apprenticeships
<ul style="list-style-type: none"> Inward investment 	<ul style="list-style-type: none"> Investment (beyond current budgets) to achieve reduction in carbon emissions. 	<ul style="list-style-type: none"> Funding secured £

2.4 B4 - Social Value Outcomes

The social value outcomes expected to be achieved as a result of the project are in accordance with BCC's Social Value Policy and the Birmingham Business Charter for Social Responsibility¹³. The scale of the Council's stock ownership is large (c. 60,000 homes); the delivery of the Whole House Retrofit Pilot presents a material opportunity for BCC to progress towards its net zero carbon ambitions, and to make a significant contribution to economic recovery and growth through employment and skills opportunities for local businesses and the local community, in addition to creating a healthy community supporting a just transition.

Six key measures of social and economic value drawn from the Birmingham Business Charter for Social Responsibility (BBC4SR) have been identified for the Pilot; these are outlined in more detail on the Economic Case:

- Number of properties transitioned to higher EPC
- tCO2e saved
- More local employment
- More local training
- Number of apprenticeships
- Fuel poverty reduction / saving to tenants

Reduced Carbon - Tackling carbon emissions is key to BCC achieving its net zero carbon objectives. BCC social housing stock accounts for circa 15% of the city's total heat GHG emissions. The WHR Pilot provides an opportunity to consider the potential to develop a scale programme over the next 30 years to support Birmingham achieve net zero. The WHR Pilot also provides an opportunity to lobby externally to (a) attract public central government and WMCA funding (b) engage with private sector investment to secure support for an investable, scale retrofit programme (c) position Birmingham at the vanguard of the zero-carbon retrofit agenda.

More local skills and employment opportunities - Nationally CITB indicates a need for 230,000 (existing and new) construction workers trained in retrofit skills by 2030 and The Heat Pump Association is forecasting demand for 35,000 trained installers (level 2 – 4) by 2028 to meet national net zero targets. Additionally, in the West Midlands nearly one in three (28.3%) of the 125,000 construction workers are over 50 years old – highlighting ongoing pressure for labour replacement. Plus, research suggests that around 30% of construction workers (some 37,500 in the West Midlands) will need retraining / updated skills to meet the transition to green skills. Specific skills demand will vary by method and approach to retrofit. The more traditional,

¹³ https://www.birmingham.gov.uk/info/50209/birmingham_business_charter_for_social_responsibility/1828/the_charter_and_policies

incremental approach has an established set of qualification pathways whilst more radical approaches are likely to use a high level of off-site design, production and assembly requiring a different combination of skills such as digital design, heat and energy appraisal, quality control, project and programme management. Due to the immaturity of the retrofit market and corresponding provision within the training and skills system an iterative approach is needed to improve skills match. In the short term a dual approach to short course updating of trained construction workers in key retrofit skill areas combined with adaptation of existing vocational training curriculum will be necessary until the market and demand are more established. For example, BCC can look to engage HEIs and FEIs such as South & City College Birmingham - for construction and Birmingham City University – for graphic and digital design; to develop curriculum to incorporate the new skills which will be in demand.

Economic growth - The upper limit to retrofit all of BCC housing stock to a net zero standard is estimated to be circa £3.6bn. Over 30 years, a total spend of around £100m per year on retrofit creates a significant market. With prudent procurement activity this could stimulate market development in the local manufacture, supply and installation of retrofit products and services that range from PV and heat pump equipment through to insulation materials, roofing and glazing. Additionally, the demand could also provide a positive incentive for regional innovation in product design, manufacture and installation, providing a boost to the regional low carbon and energy sector in BCC and across the West Midlands. The design of energy and heat management technologies and decarbonisation methods complement existing capacity within the higher education and sector specialisms and existing engagement at a regional level by the innovation agencies (including the Local Economic Partnership (LEP) and Energy Systems Catapult). The urgency of net zero targets and the scale of works means rapid development of capacity and technology is needed for the manufacture and offsite assembly of retrofit products and capacity for effective installation design – including 3D mapping and quality management. The gaps in capacity and capability across the UK supply chain for retrofit is a major barrier to widespread and accelerated adoption. As the manufacturing heartland of the UK and in combination with world leading, Higher Education (HE) institutions including University of Birmingham and Aston University, BCC is ideally placed to initiate economic growth through leadership and promoting a scale programme. Through addressing the social housing stock, BCC, in combination with an advanced local supply capability, will be well placed to promote and encourage the retrofitting activities of privately owned residences and target addressing 20% of the city's heat GHG emissions.

Creating a healthier community - The Council's climate emergency commitment is for the Council and city to become net zero carbon by 2030, or as soon as possible thereafter, as part of a just transition, to deliver the inclusive, clean growth and jobs that are needed to sustain the city's economy. The Whole House Retrofit programme will help to support a 'just' transition through assisting tenants who may be in fuel poverty; the current energy crisis is increasingly highlighting the position to vulnerable households across Birmingham. The Whole House Retrofit programme can also assist in improving the health and wellbeing of vulnerable residents, for example the health benefits associated with reducing the number of homes subject to excess cold and damp and mould; BRE: Housing Health Cost Calculator (HHCC) / Excess Cold Calculator (XCC)¹⁴ provides an indication of the cost of poor housing attributed to HHSRS Category 1 outcomes.

¹⁴ BRE: Housing Health Cost Calculator (aleo.org.uk)

2.5 B5 - Stakeholders

- Birmingham City Council – City Housing, Inclusive Growth, Public Health, Private Rental Services Team, City Operations, Members
- Private Landlords
- Land Owners – e.g Calthorpe Estate
- Residents / Tenants
- WMCA
- GBSLEP
- Government
- Businesses
- Energiesprong
- FE, HE, training providers
- Private sector investors / finance organisations

3 Section C - Economic Case and Options Appraisal

This section sets out the Options that have been considered to determine the best value for money in achieving the Council's priorities

3.1 C1 - Summary of Options reviewed at OBC stage

The scope of the Whole House Retrofit Pilot is for 300 properties of two archetypes, cross wall houses and low-rise flats. Combined, these two archetypes comprise between 35-40% of the non-high rise BCC social housing stock. It is expected that the findings and outcomes of the pilot will play a significant role in contributing to the direction and approach adopted in BCC's longer-term housing strategy to decarbonize the housing stock and improve resident health and wellbeing.

To support BCC's aim to achieve net zero carbon by 2030, resident wellbeing and meet the longer-term statutory requirement that all social housing achieve EPC 'C' at a minimum by 2035 this business case has considered three options which are summarized in the table below:

Option	Description & Scope of Works	Approach
Option 1: To achieve EPC C for 300 homes ¹⁵	<p>Business as Usual Approach to Retrofit. This option would progress retrofit based on a 'traditional' approach to repairs and maintenance in support of a target minimum EPC 'C' rating by 2035.</p> <p>The retrofit measures include:</p> <ul style="list-style-type: none">• Cavity Wall Insulation and/or External Wall Insulation• Double Glazed Windows• Energy Efficient Doors• 300mm Loft Insulation• Ventilation• Basic Draught Proofing• A-Rated Boiler (Incl Heating Distribution and Rads)	<ul style="list-style-type: none">• The pilot will be delivered by BCC's strategic R&M vendor Equans, in line with the existing contractual arrangements for commissioning capital works.• Where the full range of interventions is required, the works are estimated to take 3-4 weeks to complete.• This option has the least impact on existing BCC resources and costs. The focus of efforts remains on operating within current budget constraints with limited impact on reducing the carbon footprint of BCC's social housing stock and requiring no changes to the delivery organisation within City Housing.
Option 2: To achieve EPC B+ for 300 homes	<p>Business as Usual Retrofit Plus. This option would seek to extend the scope of retrofit measures offered based on a 'traditional' approach to repairs and maintenance in support of a target minimum Energy Performance Certificate (EPC) B rating by 2035</p> <p>The retrofit measures include:</p> <ul style="list-style-type: none">• 150mm External Wall Insulation• Triple Glazed Windows• Energy Efficient Doors• 400mm Loft Insulation• Ventilation	<ul style="list-style-type: none">• The pilot will be delivered by BCC's strategic R&M vendor Equans, in line with the existing contractual arrangements for commissioning capital works.• Where the full range of interventions is required, the works are estimated to take 7-8 weeks to complete.• This option would develop interventions targeted at uplifting the EPC rating to 'B+'. The

¹⁵ For each Option two archetypes covering four variants; Cross wall houses (end and mid terrace), Low rise flats (top and ground floor).

	<ul style="list-style-type: none"> • Air Tightness Works • Air Source Heat Pump (Incl Heating Distribution and Rads) • Solar PV and Battery Storage • De-gas properties and replacement cookers 	<p>approach and retrofit measures include changing the energy source to an air source heat pump combined with solar PV - it represents the 'enhanced business as usual retrofit plus' approach.</p>
<p>Option 3: To achieve EPC A for 300 homes</p>	<p>This option would seek to pilot and scale the innovative, whole house Energiesprong approach to retrofit and financing in support of a target minimum EPC 'A' rating</p> <p>The retrofit measures include:</p> <ul style="list-style-type: none"> • External Wall Insulation, offsite manufactured panels • Double / triple Glazed Windows and doors • Improved loft insulation/new insulated roof • Under-floor insulation or below DPC perimeter insulation • Active Ventilation • Mechanical & Electrical "pod" inc. Air Source Heat Pump, Battery/immersion diverter, hot water tank • Solar PV 4-6 kWp • Digital technical performance monitoring 	<ul style="list-style-type: none"> • The aim is for the pilot to be commissioned via RAHIP¹⁶ (BCC's strategic R&M vendor Equans is one of four providers on that framework and the aspiration is that Equans could deliver the pilot). • Through using RAHIP, the contractual target is to complete the full range of interventions in 10-15 days. • With this option the implementation of retrofit (net zero) measures would include changing the energy source to a low or zero carbon solution such as individual or community air or ground source heat pump combined with solar PV. This has the advantage of a stepped reduction in CO2 emissions and additionally supports generating market demand for emerging technologies and for new (installation) skills

All three options involve significant fabric components. Options 2 and 3 additionally involve internal interventions. BCC will work with the delivery partner(s) to develop a resident (and stakeholder) engagement plan to ensure that the transition is managed in partnership with the residents.

Options 2 and 3 represent two different routes and solutions to achieving a near to zero carbon footprint. In addition to the high fabric technical performance specification, these options include the integration of a carbon neutral energy system comprising an air source heat pump (ASHP), photovoltaic (PV) solar panels and a storage battery arrangement. BCC will work with the delivery partner(s) to provide awareness, education and training to residents in using the new solution components. Details of the approach to resident engagement and resident training are outlined in the Management Case.

Delivering the Pilot

Options 1 and 2 can be delivered within the scope of BCC's existing Capital Works arrangements with Equans. Engaging the services of Equans as the managing contractor will result in all

¹⁶ Retrofit Accelerator Homes – Innovation Partnership (RAHIP) Framework

elements of the pilot programme being managed under a “one-stop-shop” arrangement. This approach would see the ownership of the design, costing, supply chain engagement, mobilization, resident engagement, delivery handover and post works monitoring being undertaken by the managing contractor. More detail on the existing arrangements is outlined in the Commercial Case.

Option 3 would be delivered using the Energiesprong¹⁷ Net Zero Energy (NZE) approach to retrofit via RAHIP. This is an emerging, innovative approach to undertaking whole house retrofit and is distinguished by the partnering guarantee arrangements put in place between the landlord, solution provider and resident:

- a. The Performance Management Framework – a guarantee by the solution provider to the resident of a minimum level ‘Comfort Plan’ of hot water, heating and electricity for an agreed level of energy consumption.
- b. Comfort Plan – a household ‘Comfort Plan’, an agreement between BCC and the tenant which establishes a kWh/year consumption¹⁸ and comfort charge for guaranteed ‘comfort’ outcomes – delivering warm rooms every day, enough daily hot water for household use, and enough power for normal use of plugs, appliances and lighting. The comfort charge is an amount charged by BCC to the tenant representing a share of the savings made / costs avoided by the tenant. This provides a contribution to BCC which will support the wider scaling of WHR across the housing stock
- c. Performance Guarantee –the solution provider guarantees:
 - Planned maintenance costs of the retrofit improvement works over 10 years
 - Equipment replacement cycles and costs over 10 years
 - Energy performance (kW) over 10 years assuming the residents operate their homes within the agreed ES comfort plan.

This 10-year guarantee is backed up by the solution provider providing a fully costed maintenance plan with the landlord for 30 years.

The Energiesprong approach incentivises maximising the use of modern methods of construction such as off-site construction to reduce time and disruption on site, and to build the supply chain capability to deliver solutions that will support developing scalable and sustainable solutions to retrofit and providing wider green economy opportunities.

3.2 C2 – Critical Success Factors

The Critical Success Factors (CSFs) for this programme are as follows. These CSFs have been used alongside the investment objectives for the project to evaluate the possible Options.

¹⁷ An overview of Energiesprong approach to WHR can be found in Appendix XYZ

¹⁸ The charge is based on an agreed baseline energy price. Consumption by the resident above the agreed allowance is payable by the resident to the utility provider. Significant changes in the price of energy are paid for by the resident.

Desired Outcome	Critical Success Factor(s)
Business Needs – Meeting BCC's net zero carbon objective	<ul style="list-style-type: none"> •Reduced carbon emissions arising from BCC's social housing stock in line with the Council's net zero pathway
Tenants needs – Delivering homes which support tenant wellbeing and are affordable for tenants	<ul style="list-style-type: none"> •Tenant's homes meet their needs and the most up to date construction standards •Supporting tenants to avoid fuel poverty, improving health and wellbeing •Homes deliver comfort and minimize energy consumption and are affordable •Tenants are satisfied with intervention process, with home upgrade being delivered with minimal disruption to tenants •Performance of homes is actively monitored to support tenant health and wellbeing
Strategic Fit – Meeting BCC's City Housing vision, strategy and principles	<ul style="list-style-type: none"> •Customer service – deliver tenant's homes which are future proofed and not subject to multi-year interventions •Early intervention and prevention – upgrading home through a single intervention affords best outcome for tenants •Performance focused culture – evidence based approach, efficient and effective use of resources •Landlord services – improved care of tenants, proactive management of properties, estates, tenancies •Return on Investment – clear, whole-life costed benefits realization •Statutory duties – compliance with statutory legislative and policy framework •Reputational – taking account of national and local political context; engaging elected members •Levelling up strategy - making a positive contribution by undertaking targeted retro fit to fuel poor social housing households •2030 carbon target – solution best positions BCH in contributing to net zero ambition
Desired Outcome (continued)	Critical Success Factor(s)
Benefits – achieving wider social and economic outcomes	<ul style="list-style-type: none"> •Leveraged opportunity to develop local skills, including apprenticeships & support local communities •Leveraged opportunity to create local jobs •Local supply chain up-scaled to deliver pilot and positioned to meet arising demand •Stimulate and mature local supply chain, manufacturing and materials sourcing
Deliverability – City Housing's ability to manage the required change	<ul style="list-style-type: none"> •Level of change required within City Housing operations and management •BCH develop and acquire capability and capacity to manage and execute delivery oversight •Pilot to deliver within a two-year timeframe
Supply side capacity and capability – ability of market and potential suppliers to deliver the required services	<ul style="list-style-type: none"> •Leveraged opportunity to optimize local supply chains •Work with partners to expand the low-carbon sector •Ensure activity in local supply chains meets BCC ethical standards
Scalability – support BCH aspiration to scale as one of the solutions within a portfolio targeting the wider estate	<ul style="list-style-type: none"> •Gated and staged approach to pilot with clear KPIs and go/no-go criteria provides controlled approach to delivery and development of insights and learnings to support scalability
Affordability - ability to fund the required level of expenditure	<ul style="list-style-type: none"> •Impact on HRA •Ability to generate future interest from public and private sector sources of investment •Ability to support attracting future grant funding

3.2.1 Evaluating Social & Economic Value

BCC is investing in the Whole House Retrofit Pilot to test the approach and the potential to scale it up for its social housing stock to ensure future deliverability, maximise opportunities to deliver high quality homes, fit for the future and provide the skills and employment that comes along with such large work programmes.

The scale of the council's stock ownership is large: circa 60,000 homes. The delivery of a social housing retrofit pilot presents a material opportunity for BCC to progress towards its net zero carbon ambitions, and to make a significant contribution to economic recovery and growth through

employment and skills opportunities for local businesses and the local community, in addition to creating a healthy community supporting a just transition.

The Whole House Retrofit programme generates the potential for social value outputs in a number of core areas including employment opportunities, skills and health and wellbeing, as well as environmental and carbon reduction outcomes. A subset of six key measures of social and economic value drawn from the Birmingham Business Charter for Social Responsibility (BBC4SR) have been used to assess the social and economic impact of the three options.:

- a. More local employment
- b. More local training
- c. Number of apprenticeships
- d. Number of properties transitioned to higher EPC
- e. tCO2e¹⁹ saved
- f. Fuel poverty reduction / saving to tenants

Options Evaluation

The options have additionally been assessed against a broad set of evaluation criteria²⁰:

- a. Critical Success Factors (CSFs); aligned to BCC Housing strategy
- b. Risks and Issues; covering technical, supply chain, delivery tenant and costs
- c. Social & Economic Values; assessed by Equans for options 1 and 2, based on their market insight and knowledge; and by Energiesprong for option 3, based on information from ongoing, active pilots in the UK
- d. Delivered Costs; provided by Equans for options 1, 2 and 3 to ensure consistency of prices and values applied for materials and labour

To support the options assessment the following weightings were applied to the evaluation criteria:

- a. Critical Success Factors – weighting 30%
- b. Risks & Issues – weighting 10%
- c. Social & Economic Values – weighting 20%
- d. Delivered Costs – weighting 40%

To undertake the options assessment and rank the options, BCC housing, procurement and finance assessors were provided with a scoring matrix and tasked with individually scoring each of options (and a 'do-nothing' option) as either High, Medium or Low against the identified criteria. The assessment scores were presented back in anonymised form for group evaluation and moderation.

The results of the options assessment are summarized below:

¹⁹ tCO2e, tonnes of CO2 emissions

²⁰ The full list of criteria is contained in the Options evaluation matrix

Categories	Score				Weighted Score			
	Do nothing	Option1 EPC C	Option 2 EPC B+	Option 3 EPC A	Do nothing	Option1 EPC C	Option 2 EPC B+	Option 3 EPC A
Critical Success	80	100	420	480	24	30	126	144
Risks & Issues	630	600	340	250	63	60	34	25
Social & Economic	60	80	240	360	12	16	48	72
Delivered Cost	60	60	30	10	24	24	12	4
	830	840	1,030	1,100	123	130	220	245

The options assessment scores rank option 3 the highest, closely followed by option 2. Option 1 and the option to do-nothing both attracted very low scores.

Option 3 was assessed most highly in the categories of BCC's Critical Success Factors and Social & Economic value – the expectation, in line with BBC4SR, that a significant proportion of materials would be pre-fabricated locally. However, as an innovative and new approach to whole house retrofit it was also assessed to be a higher risk option and to have a higher cost – as evidenced by the low scores relative to option 1 and 2.

The findings from the economic appraisal are summarized for each option and the preferred option below:

	Undiscounted (£m)	Net Present Cost (Value) (£m)
Option 1 – EPC-C		
Capital	15,345,383	13,053,624
Revenue	1,355,558	900,370
Risk retained		
Optimism bias (if applicable)	835,047	697,700
Total costs	17,535,988	14,651,694
Less cash releasing benefits		
Costs net cash savings	17,535,988	14,651,694
Non-cash releasing benefits		
Total	17,535,988	14,651,694

	Undiscounted (£m)	Net Present Cost (Value) (£m)
Option 2 – EPC B+ (Equans)		
Capital	23,591,471	20,395,277
Revenue	1,479,264	1,022,423
Risk retained		

Optimism bias (if applicable)	1,253,537	1,070,885
Total costs	26,324,272	22,488,585
Less cash releasing benefits	663,840	406,979
Costs net cash savings	25,660,432	22,081,606
Non-cash releasing benefits		
Total	25,660,432	22,081,606

	Undiscounted (£m)	Net Present Cost (Value) (£m)
Option 3 – EPC-A (Energie Sprong)		
Capital	29,681,139	26,415,435
Revenue	3,203,338	2,053,405
Risk retained		
Optimism bias (if applicable)	1,644,224	1,423,442
Total costs	34,528,701	29,892,282
Less cash releasing benefits	6,834,840	4,190,223
Costs net cash savings	27,693,861	25,702,059
Non-cash releasing benefits		
Total	27,693,861	25,702,059

	Undiscounted (£m)	Net Present Cost (Value) (£m)
Option 4 – supplier C		
Capital	25,986,030	22,766,157
Revenue	2,203,375	1,455,372
Risk retained		
Optimism bias (if applicable)	1,409,470	1,211,076
Total costs	29,598,875	25,432,605
Less cash releasing benefits	7,141,840	5,195,878
Costs net cash savings	22,457,035	20,236,727
Non-cash releasing benefits		
Total	22,457,035	20,236,727

Option appraisal conclusions

- Option 0: Do nothing – this option, continue with business as usual, ranks last as it makes little contribution to BCC’s ambition to be carbon neutral by 2030, does not contribute to improving the tenants’ health and wellbeing by raising the quality of their living environment and does not support reducing tenant fuel poverty. It is the cheapest financial option but does not address BCC’s strategic aims.
- Option 1: EPC C – this option ranks third. The interventions planned would provide the minimum required contribution to carbon reduction. However, through having EPC C as the target the approach could be characterized as “minimum” fabric first, replacing and upgrading only where necessary. As a result, there would be a more frequent schedule of works over a number of years for individual properties addressing different failing components representing more disruption for tenants. Achieving EPC C will not deliver a stepped change to the living environment and will have a minimal effect on reducing levels of fuel poverty. This option enables BCC to achieve the expected statutory requirement for social housing to achieve a minimum of EPC C by 2035.
- Option 2: EPC B+ – this option ranks joint first. The scale of the interventions and adoption of air source heat pumps (ASHP) and solar photovoltaic (PV) panels will contribute significantly to reducing the properties’ carbon emissions. Through adopting a traditional fabric first approach to whole house retrofit this option scored lower against the categories of Critical Success Factors and Social & Economic values. It is seen as less likely to deliver value in the local supply chain. However, as a demonstrated solution with a lower financial cost than option 3, it scored higher for lower risk and costs. The works will deliver internal and external enhancements to properties which will reduce the tenant’s consumption of energy and exposure to rising energy costs – helping to reduce fuel poverty. With all works delivered through a single intervention it is less disruptive over time and provides a healthier environment in a single step for tenants.
- Option 3: EPC A / Energiesprong – this option ranks joint first. It will deliver the highest reduction in carbon to BCC. This solution combines a fabric, energy (ASHP and PV) and tenant approach to whole house retrofit. The solution is designed around achieving zero carbon emissions and delivering a performance outcome for tenants – a guaranteed level of hot water and energy for a fixed level of energy consumption. This delivers a healthy living environment for tenant wellbeing and reduces fuel poverty through minimizing tenant exposure to rising fuel costs. This is an innovative approach to whole house retrofit and using BBC4SR scoring, the volume proposed in the pilot has been estimated to have the highest impact on social and economic value through additional on-site skills and demand for the manufacturing of new and pioneering panels and roof cartridges with integrated PV. This solution scored the lowest on cost as the initial financial cost for this solution is the highest, but the approach to delivery is structured around lean principles to drive costs down over the term of the pilot. With an on-site target delivery of 10-15 days this solution delivers a future proofed property through a single intervention and offers the lowest disruption for the tenant. This option additionally incorporates a high level of digital enablement and monitoring of the WHR solution components including temperatures, energy consumption, air flow and ventilation. This supports the tenant to better monitor and manage their living environment and will, via IoT, enable BCC to receive up-to-date information on the internal environment, condition and performance of key solution components to support tenant health and wellbeing and also support proactive asset management and maintenance.

3.2.2 Overall findings: The preferred Option

Based on the detailed option appraisal and economic appraisal it is proposed that the Whole House Retrofit Pilot is progressed for option 2 and option 3. The proposal is that the option 2 solution is applied to 126 cross-wall properties and that the option 3 solution is applied to 174 low-rise flats.

3.2.3 Overall conclusions and recommendations

The proposal to adopt a pilot which comprises a combination of option 2 and option 3 will provide BCC with a robust case for impact assessment for two solutions, support the BCC ambition to evaluate and apply innovative solutions and ensure that BCC take a prudent approach to managing costs and risks.

This approach maximizes the contribution to BCC carbon aims and provides the best solutions for tenants, helping protect against rising fuel prices and through improving the living environment deliver improved health and wellbeing.

Adopting the combination of a traditional and innovative approach to whole house retrofit will support evidencing BCC's commitment to addressing environmental and social challenges to government also afford more scope to attract grant funding. In recent years this has switched between a focus on innovation versus more traditional intervention focus. This pilot covers the full range of likely focus and best positions BCC for future rounds of SHDF and other grant funding opportunities.

3.3 C3 - Risks and Issues

No.	Description	Impact	Mitigation
1	High demand for construction leading to supply constraints limit cost reduction	Difficult to secure materials and components, leading to delays and cost overrun	Share delivery plan in engagement with supply chain and ring fence orders
2	Unit delivery overruns leading to cost increase	Pilot delivery delayed and budget at risk	Root cause analysis on any overrun, implement targeted interventions to rectify / avoid
3	Shortage in availability of skills and intervention components	Pilot delayed and cost premium on skills and components	Proactive approach to forward booking of resources, purchase of components
4	Local companies may not have capacity to provide the demand for components	Materials and components are sourced outside of local geography	Early engagement with local companies
5	Failure to secure Cabinet & statutory approvals & planning	Pilot is not approved to go ahead	Pilot business case is socialised with Cabinet ahead of formal submission
6	Resurgence of COVID or other world events impact delivery	Pilot delivery is slowed, and overall delivery delayed	Appropriate measures implemented to lessen impact of events
7	Resistance to sign up to comfort plan	Delay to starting Energiesprong properties	Implementation of tenant engagement and support plan at onset of project

8	Residents unhappy with disruption & time taken to deliver interventions/works	Risk to BCC reputation and possible delays	Implement tenant and resident engagement and communications plan at onset of project
9	Failure to secure tenant participation	Risk to BCC reputation and possible delays	Implement tenant and resident engagement and communications plan at onset of project
10	Specified performance outcomes not met	Costly remedial work to address and ensure specification achieved	In situ testing and quality assurance of components and full hand over protocol
11	Design errors or omissions	Costly remedial work to address and ensure specification delivered	Phased ramp up with early assessment to performance expectations

4 Section D – Commercial Case

This considers whether realistic and commercial arrangements for the project can be made

4.1 D2 - Procurement implications and Contract Strategy

To support the development of the procurement strategy, Corporate Procurement engaged the services of Local Partnerships, who are jointly owned by the Local Government Association, HM Treasury and the Welsh Government. Local Partnerships have a wealth of experience in public sector procurement and in particular, the housing and retrofit category areas.

Local Partnerships, supported by Corporate Procurement, have undertaken a detailed market review of procurement options available for the delivery of retrofit within social housing. Specifically, the options available to deliver to EPC B+ and EPC A, as required for testing during the Whole House Retrofit Pilot. One of the main methods used to support the review was the established Energy Systems Catapult's PCR 15 compliant 'Net Zero Go: Procurement Tool'.

This review process identified 33 frameworks/ Dynamic Purchasing Systems (DPS) that exist to support the delivery of domestic retrofit. To appraise these in more detail, further desktop research and engagement with owners of the Frameworks and DPS has been undertaken to assess the suitability of their agreements. After due consideration 10 frameworks were shortlisted for further review.

As more than one route can be adopted to achieve BCC's aims and the requirements of the Pilot, Local Partnerships & Corporate Procurement developed detailed assessment criteria, against which to assess the suitability of the shortlisted Frameworks and DPSs, as well as the Council's own in house contract provisions in this area. Following this detailed assessment, the below procurement routes have been identified as the most appropriate for this pilot:

- EPC B+: The Council's current contract for the provision of R&M, Gas Servicing and Capital Improvement Works Programmes.
- EPC A: Greater London Authority: Retrofit Accelerator Homes Innovation Partnership (RAHIP)

Additional information to support the Procurement Implications and Contract Strategy is contained in Appendix 3.

5 Section E – Financial Case

This section sets out the cost and affordability of the programme

5.1 E1 - Impact on the organisation's MTFP

The purpose of this section is to set out the indicative financial implications of the two option(s) as set out in the Economic Case above.

Based on the detailed option appraisal and economic appraisal it is proposed that the Whole House Retrofit Pilot is progressed for:

- Option 2 – EPC B applied to 172 low-rise flat properties
- Option 3 – EPC A (Energiesprong) applied to 126 cross-wall home properties

The proposal to adopt a pilot which comprises a combination of option 2 and option 3 will provide BCC with a robust case to test and assess the impact of two solutions and the potential to scale the retrofit solutions.

Table 1 –

£(m) xxx	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Future Years (7-30)	Total
	£(m)	£(m)	£(m)	£(m)	£(m)	£(m)	£(m)	£(m)	£(m)
Preferred choice: Option 2									
Capital		9.26						2.53	11.79
Revenue	0.09	0.08	0.02	0.02	0.02	0.02	0.02	0.47	0.74
Total	0.09	9.34	0.02	0.02	0.02	0.02	0.02	2.99	12.53
Funded by:									
PV Export Tariff		- 0.01	- 0.01	- 0.01	- 0.01	- 0.01	- 0.01	- 0.27	- 0.33
Right to buy receipt	- 1.95								- 1.95
Borrowing	- 10.24								- 10.24
Total	- 12.19	- 0.01	- 0.01	- 0.01	- 0.01	- 0.01	- 0.01	- 0.27	- 12.53

Table 1 above shows the cost (£12.53m) of retrofitting the proposed 150 properties (2 archetypes) based on option 2. The capital cost (£11.79m) is made up of the intervention cost (cost of the retrofit) and the lifecycle (replacement) cost while the revenue cost (£0.74m) is made up of the service & maintenance and project cost. The retrofit is to be partly funded by photovoltaic tariff income of £0.33m, right to buy receipts of £1.95m, and borrowing of £10.24m.

It should be noted that though circa. £17m has been earmarked within Housing Division's business plan for the retrofit project, a significant portion of the amount is to be sourced via borrowing. There is the possibility that external grant from the government may be available which will help reduce the funding pressure but at the time of preparing this business case, details on how to access the grant or the eligible amount is not yet available. By sourcing the funding via borrowing, there is the expectation for an annual minimum revenue provision (MRP) to be set aside to help cover the repayment of the debt. The MRP has not been factored into the cashflow shown in table 1.

Table 2 -

£(m) xxx	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Future Years (7-30)	Total
	£(m)	£(m)	£(m)	£(m)	£(m)	£(m)	£(m)	£(m)	£(m)
Preferred choice: Option 3									
Capital		12.35						2.49	14.84
Revenue	0.08	0.08	0.03	0.09	0.03	0.05	0.09	1.16	1.60
Total	0.08	12.44	0.03	0.09	0.03	0.05	0.09	3.65	16.44
Funded by:									
PV Export Tariff & Comfort Plan		- 0.11	- 0.11	- 0.11	- 0.11	- 0.11	- 0.11	- 2.73	- 3.42
Right to buy receipt	- 1.95								- 1.95
Borrowing	- 11.07								- 11.07
Total	- 13.02	- 0.11	- 0.11	- 0.11	- 0.11	- 0.11	- 0.11	- 2.73	- 16.44

Table 2 above shows the cost (£16.44m) of retrofitting the proposed 150 properties (2 archetypes) based on option 3. The capital cost (£14.84m) is made up of the intervention cost (cost of the retrofit) and the lifecycle (replacement) cost while the revenue cost (£1.6m) is made up of the service & maintenance and project cost. The retrofit is to be partly funded by photovoltaic tariff income of £0.33m, comfort plan income of £3.1m, right to buy receipts of £1.95m, and borrowing of £11.07m.

The Energiesprong model provides a number of technical innovations which provide sufficient assurance around the energy savings that the contractor is prepared to guarantee an agreed level of energy savings made by households for ten years. These innovations include the high levels of roof and wall insulation, high levels of airtightness, heat recovery ventilation systems, 'free' renewable electricity from solar PV panels and digital instruments and sensors which allow detailed monitoring of energy usage and household behaviour. In turn, this allows for 'hands on' behavioural change support to help households maximise opportunities for lowering energy bills. This also allows introduction of a model by which a proportion of the financial savings made by residents are contractually 'paid back' to contribute towards the cost of retrofit works to the landlord, who would otherwise see very little if any direct financial benefits, to offset the high cost of these works. For the Energiesprong model, this tenant contribution is known as the 'Comfort Plan'.

'Pay as you save' models such as the Comfort Plan are seen as an important financial innovation which will help to make large scale retrofit projects more financially viable. Whilst the Energiesprong model is designed to support households to achieve the predicted level of savings, reassurance could be provided from testing out the levels of savings made as part of the pilot, before charging the Comfort Plan to households.

It should be noted that though circa. £17m has been earmarked within Housing Division's business plan for the retrofit project, a significant portion of the amount is to be sourced via borrowing. The total borrowing required for delivering options 2 and 3 is £21.32m (£10.24 + 11.07). There is the possibility that external grant from the government may be available which will help reduce the funding pressure but at the time of preparing this business case, details on how to access the grant or the eligible amount is not yet available. By sourcing the funding via borrowing, there is the expectation for an annual minimum revenue provision (MRP) to be set aside to help cover the repayment of the debt. The MRP has not been factored into the cashflow shown in table 2.

5.2 E2 - Impact on the Council's balance sheet

<p>The proposed expenditure will have the following impact on BCC's balance sheet:</p> <ol style="list-style-type: none"> 1) Asset increase – The whole house retrofit will result in an increase the value of the properties. This increase in value would be reflected in council's balance sheet under Fixed Assets (Property & Equipment) 2) Increased debt – The borrowing undertaken by the council to finance the retrofit will result in an increase in the value of the long-term debt of the council 3) Minimum revenue provision (MRP) – By virtue of the borrowing used to finance the retrofit, MRP is charged to the council's HRA balance to make provision for the repayment of the debt. 	
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5.3 E3 - Overall affordability

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Total Costs & Income									
	Intervention Cost	Life Cycle Costs	S&M and Project Costs	Gross Expenditure	Income Excluding Comfort Plan	Comfort Plan	Gross Income	Net Expenditure	NPV
Option 1	5,874,371	1,794,000	677,779	8,346,150				8,346,150	6,972,822
Option 2	9,260,547	2,525,250	739,632	12,525,429	(331,920)		(331,920)	12,193,509	10,495,758
Option 3	12,354,320	2,486,250	1,601,669	16,442,238	(331,920)	(3,085,500)	(3,417,420)	13,024,818	12,139,309
Per Unit Costs & Income									
	Intervention Cost	Life Cycle Costs	S&M and Project Costs	Gross Expenditure	Income Excluding Comfort Plan	Comfort Plan	Gross Income	Net Expenditure	NPV
Option 1	39,162	11,960	4,519	55,641				55,641	46,485
Option 2	61,737	16,835	4,931	83,503	(2,213)		(2,213)	81,290	69,972
Option 3	82,362	16,575	10,678	109,615	(2,213)	(20,570)	(22,783)	86,832	80,929

Table 3 above provides a summary of the net expenditure of delivering the project (150 properties – 2 archetypes) based on the three options considered.

The net cost of delivering options 2 and 3 is £25.21m over the thirty years expected lifespan of the WHR project. Circa. £17m was originally earmarked for the WHR project within Housing Division's business plan on the basis that £1.62m would be funded by grant, £3.9m funded by 'Right to Buy' receipts and £11.24m by borrowing.

At the time of writing this business case, confirmation of available grant by government has not been received so it may be prudent to assume that £21.32m (£25.21 - £3.9) of borrowing would be required to deliver options 2 and 3. On the basis that the £21.32m can be borrowed via PWLB at the average interest rate of 2.55% over thirty years, this would result in a cost of borrowing of £708.7K over the loan period.

It is worth highlighting the risk associated with the comfort plan relating to option 3. It is assumed that income contribution of £3.1m over the life of the project will be achieved via the comfort plan so if this income from tenants does not materialise, it would increase the cost of delivering the project.

5.4 E4 – Approach to Optimism Bias and Provision of Contingency

The scope of work assumes that the properties to be retrofitted are likely to be in a poor state. It is possible that not all properties will require a full set of retrofit interventions (e.g. new boiler/heating system, doors and windows) this will be determined during detailed survey works. Preliminary costs have been priced at 12% of measured works and are subject to change following the development of a full works programme.

Though a contingency of 5% has been included in the costs, it should be noted that this is unlikely to cover unforeseen works such as structural works, asbestos removal, damp works etc.

Optimism bias have not been considered in the cost projections.

5.5 E5 – Taxation

The supply and installation of energy saving materials is liable to VAT at the standard rate of 20%.

As BCC's provision of residential accommodation through its HRA is a non-business activity for VAT purposes, BCC can reclaim VAT on the costs of maintaining its residential stock within its HRA. Therefore, BCC can reclaim VAT on the installation of energy saving materials within HRA residential properties. As such, VAT should not be a cost to the project.

6 Section F – Management Case

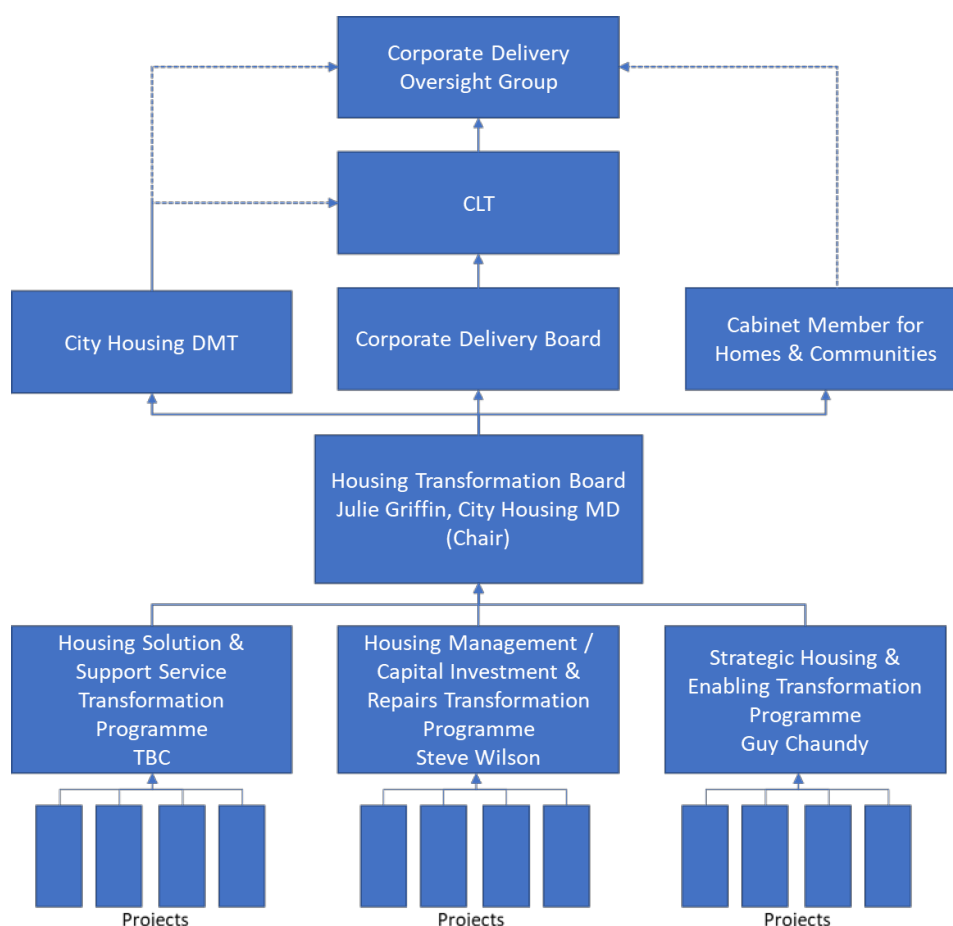
This section considers how robust your programme delivery plans and arrangements are

6.1 F1 - Programme management arrangements

The Whole House Retrofit Pilot project is an integral part of the City Housing Transformation Programme which comprises a portfolio of projects for the delivery of the City Housing vision:

- To become “best in class”
- To provide a responsive and sustainable service that is relentlessly reliable and builds trust by placing tenants and residents at the centre of what we do.
- Offering excellent customer service, ensuring our tenant’s homes meet their needs and standards for now and the future.

The City Housing Transformation Programme governance and its interface to the Council’s corporate governance arrangements is illustrated below:



The Whole House Retrofit Pilot project is a core component of the Housing Management / Capital Investment and Repairs Transformation Programme.

Each City Housing Transformation Programme is led by a named SRO and reports to the Housing Transformation Board. The Housing Transformation Programme Board, chaired by the MD City Housing is responsible for delivery of the portfolio of projects and provides strategic leadership and direction.

6.2 F2 - Programme management arrangements

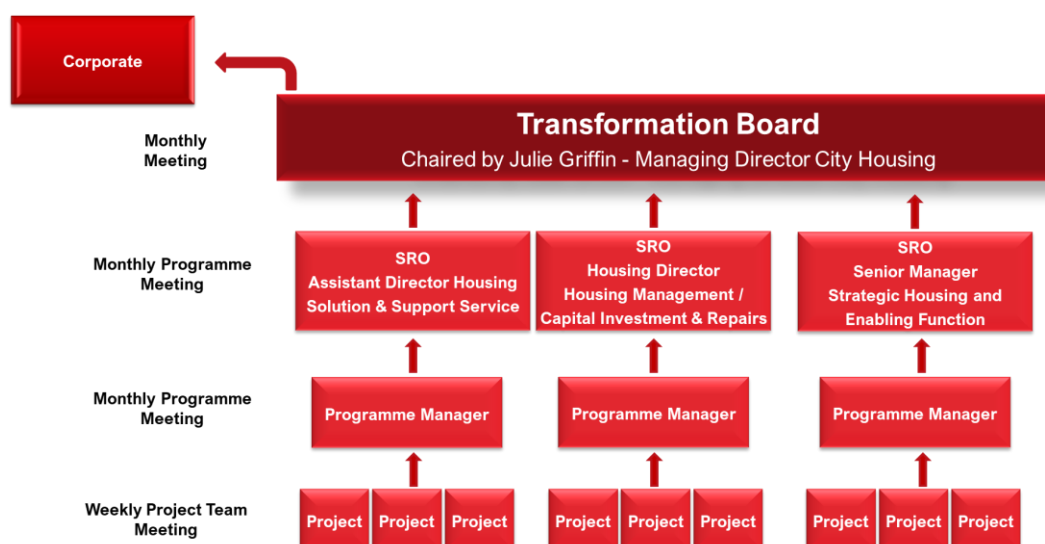
The project will be managed in accordance with BCC corporate projects and programmes methodology, as agreed with the Housing Transformation Programme and corporate PMO.

The project will report monthly in line with the Corporate PMO dashboard reporting.

6.2.1 Programme reporting structure

Oversight of the project will be provided by the City Housing Transformation Programme Board which meets monthly and addresses projects by exception, or otherwise at the discretion of the Chair.

The Housing Transformation Programme organization and reporting structure are illustrated in the figure below:



6.2.2 Programme roles and responsibilities

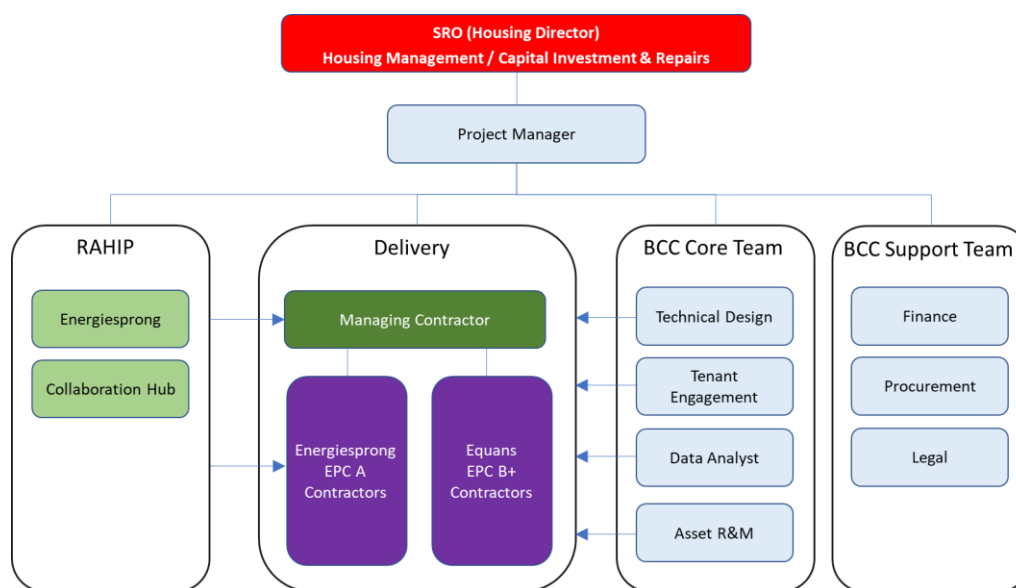
The BCC Whole House Retrofit Pilot core project team will include:

- **Senior Responsible Owner** - responsible for primary engagement and oversight, budget timing, quality compliance and grant application activities.
- **Project Manager** - responsible all project delivery, including day to day liaison with managing contractor and internal departments to support logistics, access arrangements and resident engagement
- **Housing Technical Design lead** – responsible for advising on technical, quality and energy related matters at all stages of the development process; performance and quality management of commissioned designs; managing the Council's design brief all key internal stakeholders.
- **Housing Assets / Capital R&M lead** – responsible for ensuring pilot delivery is compliant with all statutory, contractual, Health and Safety legislation and regulators requirements.

- **Housing Management and tenant engagement lead** - responsible for dealing with the tenants, local authorities, residents, local resident associations and groups and other stakeholders in the pilot geographic area. Additionally, responsible for the creation and delivery of tenant engagement plan(s) and content, and of tenant education, awareness and training. Responsible for executing tenant feedback activities.
- **Housing Data Analyst** – responsible for managing the ongoing reporting requirements, including performance analytics and ad hoc reporting requests. Responsible for ensuring integrity of property data in asset management systems, budget reviews and preparation (as needed).
- The BCC supporting team will include:
- **Finance lead** – budget and financial management services including grant application support.
- **Procurement lead** – putting in place and monitoring compliance within agreed procurement arrangements and advising any changes in scope.
- **Legal lead** – advice on initial contracting arrangements, and arising legal issues over the duration of the pilot including but not limited to right to buy and leasehold.

It is intended that the Pilot will be delivered by BCC's Strategic Housing Repair Partner (Equans). Equans will act as the overarching Solution Delivery Partner for the two options.

The Whole House Retrofit Pilot project organisation and reporting structure is illustrated below:



Core project management activities will include:

- Monthly progress monitoring meetings. These meetings will be chaired by the SRO, led by the BCC project manager and attended by the managing contractor and key project team and other key stakeholders.
- Weekly project management team meetings chaired by the BCC project manager and led by the managing contractor and Energiesprong leads)
- Weekly scheme delivery meetings at which the managing contractor will monitor pilot progress, resolve arising issues, categorise and report on risks and mitigations.
- Quarterly Collaboration Partner Meetings bringing together the SRO, managing contractor, senior leads from key supply vendors, Energiesprong and collaboration hub representatives; this group will provide an assurance check on project progress, shared learnings to contribute to problem resolution and emerging insights from more advanced pilots.

- Pilot resources and project risks will be reviewed by exception at each monthly meeting with a focus on ownership, timescales and dependencies

The project resource costs are captured in the financial model above.

6.2.3 Programme plan

The WHR programme plan²¹ comprises four key components, tenant and resident engagement; the WHR of 174 low rise flats, using the existing housing capital programme contractual arrangements; the WHR of 126 cross wall properties using the RAHIP framework; and report The high-level milestones for these three components are detailed in the tables below. The WHR programme team will undertake planning and preparation activities to ensure the programme is in a position to mobilise following consideration by Cabinet:

Milestone Activity – Tenant & Resident Engagement	Month
Confirm target properties/tenants – by archetype	July 2022
Develop and agree engagement plan	July/Aug 2022
Initial tenant and community engagement	July - Sept 2022
Initial tenant engagement - design and concepts ²²	July - Sept 2022
Comfort plan and in principle agreement (cross wall)	July - Oct 2022
Condition surveys by archetype	July/Aug 2022
Engagement- Pre, during and post works – by typology	September 2022
Commissioning and handover – by typology	December 2022
Tenant pilot evaluation	March 2024

Milestone Activity – WHR 174 low rise flats	Month
Pre-construction activities	July 2022
Supply chain procurement	September 2022
Pilot block (1 x 8 units)	Oct/Nov 2022
Assessment and review	Dec 2022 /Jan 2023
Phased Block rollout (12 x 14 units)	Jan 2023 – Jan 2024
Pilot scheme evaluation and report	March 2024

Milestone Activity – WHR 126 cross wall properties	Month
Retrofit system design	July 2022
End of stage evaluation	September 2022
Stage: Prototype 10 cross wall properties	Oct/Nov 2022
End of stage evaluation	February 2023
Stage: Pilot 30 cross wall properties	March/April 2023
End of stage evaluation	July 2023
Stage: Commercialise 86 cross wall properties	Aug 2023 – Jan 2024
Pilot scheme evaluation and report	February 2024
Digital operation of performance monitoring	February 2024

²¹ See appendix XYZ for more detail on the programme plan.

²² For cross wall using Energiesprong solution will include Comfort Plan and tenant energy bill baseline

Milestone Activity – Report to Cabinet	Month Beginning
Report to Cabinet – Business Case approval	July 2022
Interim Progress Report to Cabinet on Pilot	March/April 2023
Report to Cabinet on Pilot and recommendations for Scaling	March/April 2024

6.3 F3 - Use of special advisers

Special advisers and officers were consulted in developing the business case used as follows:

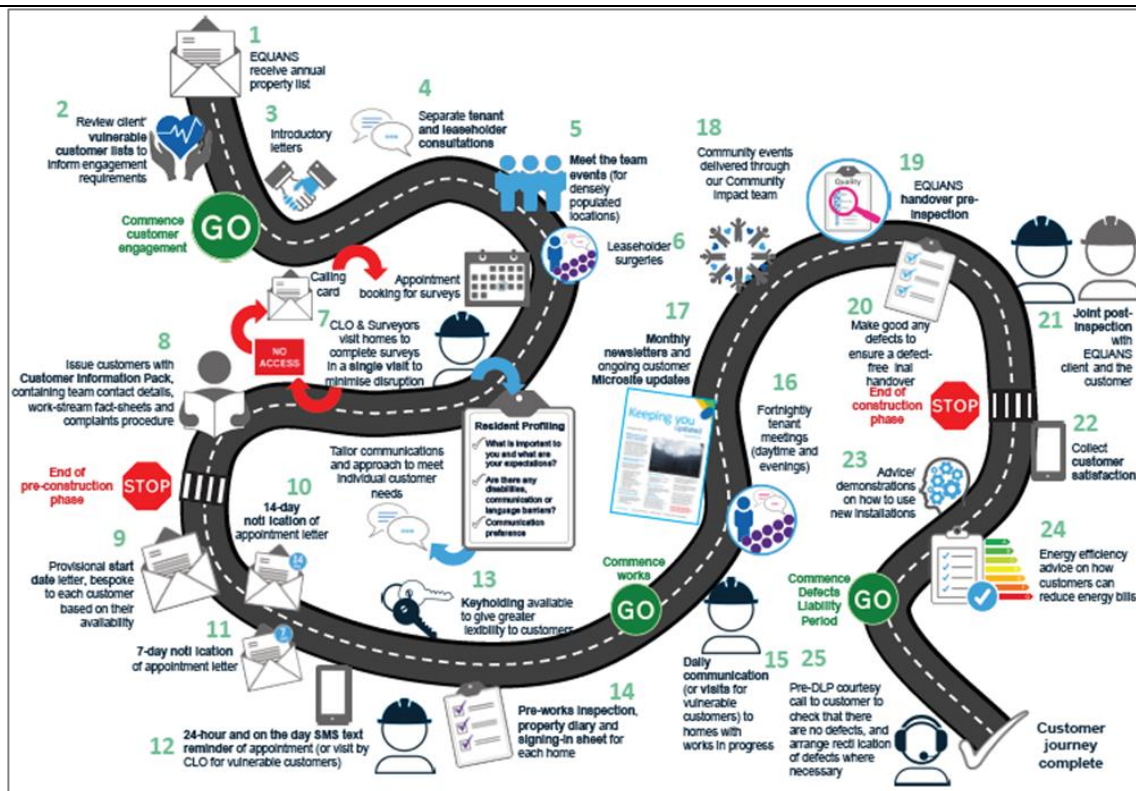
Specialist Area	Adviser
Economic	Spencer Wilson, John English, Kerry Billington, GBSLEP Wayne Shand Chris Sood-Nicholls, David Willock, Lloyds Rokneddin Shariat, BCC Mark Ambler, Tara Shresty–Carney, PwC
Skills	Ilgun Yusef, Tara Verrell, BCC Mike Hopkins, Bob Howlett, SCCB Spencer Wilson, John English, Kerry Billington, GBSLEP
Financial	Andrew Healy, BCC Chris Sood-Nicholls, David Willock, Lloyds
Technical	John O’Leary, Paul Bingham, Phil White, David Parry, Lee Ashmore, Steve Batty, Chris Saunders, Equans Keith Butler, Focus Consultants for Nottingham City Council
Tenant Engagement	John Bloss, London Borough of Barking & Dagenham
Procurement / Legal	Kore Mason, Turner & Townsend Neil Pierce, Head of Sustainability & Climate Change, London Borough of Barking & Dagenham Michael O’Doherty, Vicky Kingston Local Partnerships

6.4 F4 - Arrangements for change management

Change management will be delivered in line with the framework defined by the corporate PMO and adopted by the City Housing Transformation programme.

The Whole House Retrofit Pilot will be a new and transformative approach to improving homes. In addition to the delivery of capital interventions to the fabric of homes, it incorporates a change in the energy supply from gas-based heating to a combination of Air Source Heat Pumps (ASHP) and solar Photo Voltaic – this will deliver a different tenant experience. Engagement with BCC tenants (and residents in the selected neighbourhood) over the lifecycle of the Pilot, including education, awareness and training on the operational and behavioural impact of the retrofit solutions is core to the change management approach.

Equans has a strong track record of delivering planned maintenance services with tenants. The Whole House Retrofit Pilot will deploy their resident engagement framework – this places the resident and tenant experience at the heart of the delivery. This is illustrated below:



To promote a partnership approach with tenants, the Pilot project will engage with tenants and other key stakeholders as early as possible. Communications events will be held with key stakeholders to promote the rationale and benefits of the pilot, address resident and community concerns and set out how delivering in partnership will work – helping shape the approach to co-design, consultation, communication, and liaison.

The resident engagement approach will be deployed from the outset and will include

- Resident involvement in design process
- Solution Provider presentations to residents
- Liaison regarding up-coming works to homes
- Consideration and planning for decant arrangements if required

This approach will be informed from the experience of other Energiesprong local authority landlords and leverage the work underway as part of the East Birmingham Inclusive Growth Programme around community engagement and community learning.

6.5 F5 - Arrangements for benefits realisation

Benefit realisation for the project will be overseen at the Housing Transformation Programme level by the Housing Management / Capital Investment & Repairs Transformation Programme and City Housing Transformation Programme Board. The programme manager will be responsible for the day-to-day implementation of the benefit realisation plan.

The high-level objectives and benefits will be as set out in this business case. The detailed benefit realisation plan will be developed during the solution design phase of the project and reported to the City Housing Transformation Programme Board.

6.6 F6 - Arrangements for risk management

Risks will be managed at the project level by the Project Manager and at City Housing Transformation Programme level by the Housing Management / Capital Investment & Repairs Transformation Programme City Housing Transformation Programme Director and Programme Board.

Risk management methodology will follow the City Council's standard approach as agreed with the Corporate PMO.

A schedule of risks and issues is provided at Section 3.3.

6.7 F7 – Arrangements for dependency management

Dependencies between project workstreams will be managed at a day to day level by the Project Manager and at City Housing Transformation Programme Board

6.8 F9 - Arrangements for contract management

The pilot will be applying two different approaches to WHR; contract management arrangements are set out in Section 7 of the procurement strategy.

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6.9 F10 - Arrangements for post project evaluation

The Whole House Retrofit Pilot project will undertake an interim review of progress in March/April 2023 and a fuller review on the success of the Pilot and recommendations for scaling the solutions in March/April 2024 following the wider solution rollout.

The Pilot evaluation criteria will be developed based on the Critical Success Factors detailed in Section 3.2 above.