

REPORT TITLE: MAKING HOMES CARBON NEUTRAL

10 MARCH 2021

REPORT OF CABINET MEMBER: Cllr Kelsie Learney, Cabinet Member for Housing and Asset Management/Cllr Lynda Murphy, Cabinet Member for the Climate Emergency

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WARD(S): ALL

PURPOSE

As part of its commitment towards carbon reduction, The Council has allocated £15.7m in the Housing Revenue Account capital programme to fund measures to improve the energy efficiency of the Council's Housing stock, help reduce energy demand overall and to significantly reduce carbon emissions from Council homes.

Achieving net zero carbon from the 5000 dwellings will cost in excess of £75m and programmes will be needed for the replacement of gas heating systems. A number of trials are currently being funded by Government grant to identify how best to invest the £3.8billion the Government has allocated for this work.

This report proposes the £1.6m annual programme initially focusses on improving energy efficiency through additional insulation measures (a "fabric first" approach). Solutions for replacement heating and renewable energy generation will be determined over the next two years and it is proposed an officer/member/tenant panel/forum be established to review progress and determine longer term solutions.

**RECOMMENDATIONS:**

- 1) That the 2021/22 budget of £1.587m provision for additional energy efficiency works to Council dwellings be committed and approved for expenditure as follows:
  - a) £1,250m to fund additional insulation (mainly wall and floor insulation) to 100 properties currently subject to an Energy Performance Certificate (EPC) rating of D or below and that the programme focus mainly on void properties where possible.
  - b) £150,000 set aside to support “match funding” bids for major retrofit programmes (such as the existing project to improve “Swedish timber” homes in Bramdean).
  - c) That £187,000 to address energy efficiency of communal areas in sheltered/communal housing schemes, including the installation of solar photovoltaic panels where appropriate.
- 2) That a member/tenant/officer panel/forum be established to assess progress with national trials, review funding options and bring forward proposals for a long term programme to replace gas heating systems in Council homes, subject to consultation with tenants and the Business and Housing Policy Committee.
- 3) That the Council join the “Net Zero Collective” partnership to support the work of the above Panel.

IMPLICATIONS:**1 COUNCIL PLAN OUTCOME**

- 1.1 Tackling the Climate Emergency and Creating a Greener District – The retrofitting of additional energy and carbon reduction measures to the Council’s Housing stock is a key action in the Carbon Neutrality Action Plan.
- 1.2 Homes for all – The Homes for All priority sets out an aspiration for all homes to be energy efficient and affordable to run and a commitment to move the energy efficiency of new and existing homes towards zero carbon.
- 1.3 Living Well – The Council is committed to addressing health inequalities and the Council Plan includes a commitment focus our activities on the most disadvantaged areas, communities and groups. This would specifically include those either experiencing or at risk from fuel poverty. The proposals to improve energy efficiency of homes and reduce energy demands will directly support this commitment.

**2 FINANCIAL IMPLICATIONS**

- 2.1 The Housing Revenue Account (HRA) budget approved by Council in February 2021 (CAB3290 refers) includes provision of £15.7m between April 2021 and March 2031 (with annual allocations indicated in the table below) to fund energy efficiency and carbon reduction measures to Council dwellings. This is in addition to the Major Repairs programme previously approved in the HRA business plan.

<b>Year</b>	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	<b>Total</b>
<b>HRA Budget</b>	1.587	1.428	1.415	1.457	1.501	1.546	1.592	1.640	1.687	1.740	<b>15.695</b>

- 2.2 The cost of fully retrofitting each property type, including “fabric first” measures to improve insulation and reduce energy demands, replacing gas heating systems and potential installing additional energy generation measures have yet to be determined. A number of trials are currently underway across the country to identify potential solutions. Much will depend on the extent to which the national electricity grid can be de-carbonised.
- 2.3 Assuming costs per property of between £15-20,000, total costs across the Council’s stock would be between £75-100m. Work to identify scope to free up further HRA resources to support this programme will continue. However, the programme will clearly rely heavily on securing additional grant funding. The Government has set aside £3.8 billion through the Social Housing Decarbonisation Fund.
- 2.4 The £1.587m annual programme for 2021/22 included in the HRA budget will support:

- a) “Fabric First” works to 100 properties annually at an estimated £12,500 per property (mainly void properties).
- b) £150,000 set aside to support “match funding” bids for major retrofit programmes (such as the existing project to improve “Swedish timber” homes in Bramdean).
- c) £187,000 to address energy efficiency of communal areas in sheltered/communal housing schemes, including the installation of solar photovoltaic panels where appropriate.

### 3 LEGAL AND PROCUREMENT IMPLICATIONS

- 3.1 The Climate Change Act 2008 ('the 2008 Act') set a target for the United Kingdom to reduce carbon emissions to 80% below 1990 levels by 2050. It also set an interim target of a 34% reduction by 2020 and established the concept of carbon budgets.
- 3.2 The city council as a Local Planning Authority has a policy requirement under the NPPF to minimise the impact of new development in the borough from an energy performance and efficiency perspective. The UK government has announced targets for all new housing to be "zero carbon ready" (the “Future Homes Standard” consultation). The main requirements on the energy performance and efficiency of buildings are contained in the Energy Performance of Buildings (Certificates and Inspections) (England and Wales) Regulations 2007 (as amended) and in Part 6 of the Building Regulations 2010.
- 3.3 The proposals included in this report are consistent with the council's obligations set out in the above legislation.
- 3.4 The Council has an obligation as a best value authority under section 3 of the Local Government Act 1999 to “make arrangements to secure continuous improvement in the way in which its functions are exercised, having regard to a combination of economy, efficiency and effectiveness”.
- 3.5 Any procurement for goods and services will be in line with the Council’s Contract Procedure Rules and Public Contract Regulations 2015(PCR2015) and subsequent contracts managed in-line with the Council’s Contract Management Framework.

### 4 WORKFORCE IMPLICATIONS

- 4.1 Commissioning of works can be administered by the existing Property Services team. However, additional resource is required to support research and options appraisal work, coordinating bids for Government funding and developing tenant engagement programmes. To support this work, an additional full time post has been included in the HRA Budget (CAB3290 refers). This new post will lead this programme of works and bring forward

proposals for investment in future years based on the options set out in section 16.4 of this report.

- 4.2 As an HRA funded post, this new resource will focus wholly on work to the Council's existing stock. However, they will also positively support the work of delivering the corporate Carbon Neutrality Action Plan.

## 5 PROPERTY AND ASSET IMPLICATIONS

- 5.1 The existing major repairs programme has been developed to ensure all Council dwellings are maintained in accordance with the Decent Homes standard. Gas heating systems are installed in over 4000 homes and the Council will need to determine how best to replace the use of gas as the primary fuel for heating as part of its commitment to carbon neutrality.
- 5.2 The £15.7m included in the HRA budget will predominantly be used to support work to address the energy efficiency of the 2000 properties that currently have an EPC rating of D or below.

## 6 CONSULTATION AND COMMUNICATION

- 7 A number of briefings with both members and tenants have been held over the last year to consider the options for additional carbon reduction measures in the Council Housing Stock, including:

- a) Member/Tenant briefing – March 2020
- b) TACT briefing – 15 September 2020
- c) Health and Environment Policy Cttee – 30 September 2020
- d) TACT/Tenant Repairs Service Group – 29 January 2021

- 7.2 In addition, a digital survey was completed in November 2020 which sought to understand residents' views and priorities in relation to achieving the corporate and national targets for energy efficient homes.
- 7.3 527 responses were received. Key issues highlighted were concerns with the running costs of any final solutions and the timing of works and potential disruption to tenants.

## 8 ENVIRONMENTAL CONSIDERATIONS

- 8.1 The proposals set out in this report and the options for future works still under consideration will all contribute to the key priority of working towards a Carbon Neutral district by 2030.
- 8.2 With each household producing an estimated 4-5 tonnes of carbon annually through electricity and/or gas consumption, very significant investment is needed to get close to "carbon neutral" and will rely on Government funding as well as the decarbonisation of the national electricity grid through major

national renewable energy programmes. However, by using the funds already identified to focus on improving the energy efficiency of properties and therefore reducing the overall energy demand, the Council will be making best use of available funds in the short term.

- 8.3 A comprehensive retrofit solution for the average dwelling can save an average of 1.6 tonnes per property per year. Therefore, retrofitting the entire stock could save 8,000 tonnes of carbon per year, or 1.3% of the total district carbon footprint.

## 9 EQUALITY IMPACT ASSESSEMENT

- 9.1 The 2021/22 programme will focus on works to void properties. Longer term solutions to replacing heating systems in all properties will require full impact assessment once an appropriate programme has been determined.

## 10 DATA PROTECTION IMPACT ASSESSMENT

- 10.1 All works will be commissioned in accordance with existing robust procedures for ensuring data protection compliance

## 11 RISK MANAGEMENT

<b>Risk</b>	<b>Mitigation</b>	<b>Opportunities</b>
<i>Property</i> <i>Increased void periods and longer waiting lists</i>  <i>Works not complying with relevant standards</i>	<p>Voids target will need to be adjusted to reflect these additional works</p> <p>All work commissioned will be in line with latest building standards and take full account of all issues covered in the Hackitt review of Building Regulations and Fire Safety</p>	
<i>Community Support</i> <i>Disruption when works carried out to occupied properties</i>	<p>Initially focus on void properties and homes where residents actively volunteer for additional works. Support to be provided with storage/decanting.</p>	
<i>Timescales</i> <i>Not achieving the 2030 target for net carbon neutrality</i>	<p>Compliance will in part rely on national funding and progress with plans for decarbonising the</p>	

	national grid	
<i>Project capacity Insufficient skills nationally and locally for some renewable energy solutions</i>	National programmes currently being developed to support this. Scope for local training programmes could be considered, particularly in partnership with other social landlords	
<i>Financial / VfM Govt funding not available to support full programme</i>	Scope for additional funding from HRA under review. Some options (electric heating) more affordable for HRA	Moving away from “wet” heating systems could achieve very significant maintenance savings (approx. £600k per year).
<i>Innovation No clear solution emerging from national trials</i>	Several programmes now underway and proposal to join “Net Zero Collective” will assist here	
<i>Reputation Failure to comply with Council’s “net zero carbon district” by 2030 target</i>	Significant investment from HRA already identified with further work underway to assess potential to free up additional resource. Full compliance will always rely on national programmes and funding.	

## 12 SUPPORTING INFORMATION:

- 12.1 An average household can consume approximately 5,000 kWh of electricity annually (1,500 kg of carbon) and 18,000 kWh of gas (3,300 kg of carbon). Based on these assumptions, carbon emissions from Council homes could be estimated to be between 10-15,000 tonnes per year.
- 12.2 The hierarchy of energy efficiency was conceived as part of the Local Government Position Statement on Energy in 1998 and established the following order or priority for energy efficiency measures:
- a) Priority 1 - Fabric First - reduce energy demand and/or reduce waste
  - b) Priority 2 - Appliances - use more energy efficient appliances
  - c) Priority 3 - Renewables - supplement the remaining energy demand with low/lower carbon renewables

- 12.3 Various different models have been constructed over the years since, but the above is widely accepted as the correct and proper order in which to reduce overall energy demand in the home.
- 12.4 Costs to retrofit domestic properties will vary significantly. Even accounting for the number of flats in the Council's stock, retrofit costs could still be in excess of £15k per property meaning whole stock retrofit would cost £75m.
- 12.5 Solutions will differ by property type. The only solution relevant to every property will be improving the "fabric" and improving insulation in order to reduce energy demands. It is proposed that the existing budget provision (£15.7m over the next 10 years) be used predominantly to support this work, particularly in the early years of the programme and subject to potential Government grant.
- 12.6 Arguably the biggest challenge for the Council will be how to replace existing gas heating systems (over 4,000 properties), which contribute to carbon emissions far more than electric or renewable heating.
- 12.7 Scope for additional measures including renewable heating and renewable energy generation will rely heavily on national funding. A number of trial schemes across the country are currently being supported by grant schemes such as Social Housing Decarbonisation Fund 'Demonstrator'. The Government has indicated that a further £3.8 billion will be allocated through this fund once trials have produced results.
- 13 "Fabric First"
- 13.1 The national Clean Growth Strategy has set a target to upgrade as many houses to EPC Band C by 2035 "where practical, cost-effective and affordable", and for all fuel poor households, and as many rented homes as possible, to reach the same standard by 2030.
- 14 The Council's homes do achieve an average EPC rating of C. However, over 2,000 are still at band D or below. Therefore, a major programme of improving insulation and energy efficiency of these 2,000 properties should form the first priority of any retrofit programme.
- 15 The cost of getting poor performing properties to at least an EPC C is estimated at £12,500 per property (not including external wall insulation). An estimated 100 per year of these properties are likely to become void at some stage each year and it is proposed to exploit these opportunities to complete works without disrupting tenants. However, to improve all 2000 in the next 10 years will require disruption/decanting for tenants. It is therefore proposed to use a proportion of the budget in the next two years to support work in tenanted properties but only where tenants are keen to work with us. Future Government grant for external insulation programmes may well support

- 15.1 In essence, the “fabric first” approach recommends super-insulating the external envelope elements of the home (eg. roof; walls; windows; doors; floors;) to reduce energy demand and waste.
- 15.2 To achieve the corporate and national carbon targets, improving the insulation to the elements of the external fabric of homes needs to be the primary measure for reducing energy demand/waste in the home - and starting with those homes with the poorest energy rating. This, in turn, should have the beneficial effect of lowering energy bills for residents.
- 15.3 The modelled annual energy cost of the average B and C rated home is around £750 less than the average D and E rated home, assuming both homes are being adequately heated. (See Appendix C - 2018/19 English Housing survey).
- 15.4 The Decent Homes Standard stipulates that homes should provide a reasonable degree of thermal comfort and be free of excess cold - but, apart from this requirement, there is currently no minimum energy efficiency standard which applies in the social rented sector. The Decent Homes Standard is also a relatively low standard - with this expectation broadly equivalent to EPC E and F. The Government has committed to a review of the Decent Homes Standard to consider how it can better support the decarbonisation and energy performance of homes, particularly with regard to the ambition set out in the Clean Growth Strategy that all homes should meet EPC C and above by 2035, where practical, cost-effective and affordable.
- 15.5 Energy supply costs are unlikely to come down in the near future - so the “Fabric first” approach is universally accepted as the corner stone and correct starting point if residents are to have any influence or mitigation over high energy costs. Once fitted, the measures deployed in the “fabric first” approach should also deliver relatively indefinite and ongoing energy saving benefits. In addition, a significant proportion of homes nationally (approx. 20%) currently overheat even in cool summers - so there is a broader need to ensure that our homes are not just efficient, but adapted to the future climate.
- 15.6 “Fabric first” elements:
- a) Roofs - loft insulation in the roof space is the best measure for energy efficiency in the home - it is relatively cheap, easy to install and the payback (albeit not to the Council) can be a little as two years or less. Insulation checks and upgrades to roofs have for many years been a standard part of the Council’s existing heating and roofing renewal works - so there are no new or additional measures proposed for this element of the fabric.
  - b) Windows/doors - double-glazed windows and doors will improve the comfort of the home by stopping heat loss, cold draughts and improve soundproofing. However, from a payback and carbon perspective the benefits are relatively small. This is even more so in the case if just

replacing existing double-glazed units with more modern double or triple glazed units. 98% of our stock already have double glazed windows - with the small remainder not upgraded due to practical restrictions (eg. designated properties) - so the focus and priority here needs to be a programme of secondary glazing to the designated dwellings. 94% of our non-communal external entrance doors are already double-glazed. Therefore, apart from the secondary glazing programme, the proposal here is to continue with the standing policy of only replacing or upgrading existing double-glazed windows/doors as and when they are beyond economic repair. Replacing window/doors before they are beyond economic repair and/or on an ad-hoc basis is also likely to attract service charge/leaseholder issues and disproportional access costs.

- c) External walls - external walls tend to come in two forms - solid walls and cavity walls. The general rule is that properties built prior to 1930 will have solid walls, and anything built thereafter is more likely to have cavity walls. Similar to loft insulation, cavity wall insulation is relatively cheap, easy to install and has a relatively quick payback period.

Solid walls have no cavity - so these walls would need to be insulated either externally or internally. Internal wall insulation is generally much less expensive than external wall insulation - although the former is very much more disruptive to the occupants (decants are generally recommended) and there is an accompanying loss of floor space/amenity.

Although the vast majority of the stock already have cavity fill, to reduce the heat loss further the proposal here is to trial a number of internal insulation upgrades to properties when empty (void). This will be reviewed to see if the expected pros justify and out-weigh the anticipated cons - and particularly whether or not carrying out the same works with tenants in occupation would be reasonably practicable. Due to the very significant costs, the standing repair policy (since 2016) has been that external wall insulation should not be entertained unless there is significant external funding available. Subject to the success of the government initial demonstrator project (approx. £50m) - and the ability of the participants to innovate and produce some significant cost savings for *en masse* retrofit projects going forward - the government will roll out the full Social Housing Decarbonisation Fund ( £3.8b), to upgrade social housing properties currently below EPC Band C to at least that standard. Until that time, the proposal is not to progress or trial any external wall insulation schemes. The only exception to this is the Swedish unit trial - which is due to be completed in the coming months and the standing proposal is to continue thereafter with upgrades to all remaining units (24 in total).

- d) Floors - the arguments that apply for internally insulating the external walls apply equally to the ground floor of dwellings. So, for the same reasons, the proposal is to trial a number of internal insulation upgrades to the floors when properties are empty (void).

15.7 If enhancing the insulation in voids were the only wall insulation programme in place, then by 2030 we estimate that a further 1000 No. EPC D and E and below properties could be moved nearer to, or above, EPC B and C. If we assume that the average void insulation upgrade would cost an additional £12.5k per void, then the additional budget needed would be approx. £12.5m over the following 9 years. This would leave another 1000 No. properties that would still either need external wall insulation or internal wall insulation (with willing participants - i.e. the tenant either in occupation or decanted to another property) - so this would require a separate and concurrent "occupied" property programme to run concurrently with voids.

## 16 Appliances/Heating

16.1 Obviously, tenants are responsible for the supply and maintenance of most home appliances. However, the fixed heating appliance/s provided within the home (i.e. in place at the start of the tenancy) are supplied and maintained by the Council - so residents might have little or no influence over the choice of system and the associated running costs.

16.2 Since 2016, residents have been offered one of only two heating appliance options - either a gas boiler or quantum heaters. All solid fuel/open fire options have effectively been discontinued because they are inefficient and costly to maintain. The preferred choice for the majority of tenants is still gas - and naturally so - because it is efficient, effective and the running costs for residents are relatively low. 90% of our current heating systems have gas boilers. The table below shows the current mix of heating solutions across the Council dwelling stock.

Heating type	Number
Gas	4501
Electric – Quantum heaters	314
Electric – Electric boilers	10
Electric – Storage heaters	99
Air Source Heat Pumps	71
Biomass Boilers	16
Liquid Petroleum Gas	4

Solid Fuel	48
Oil	2
	<b>5065</b>

- 16.3 The Government is clearly committed to generating new clean power with offshore wind farms, nuclear plants and by investing in new hydrogen/bio-methane technologies. Over the coming decades, electricity will become a significant proportion of the energy we use in and around the home - powering electric cars, replacing petrol and diesel, and enabling the installation of other electric appliance options to reduce the need for oil and gas to heat our homes. Clean electricity is therefore due to become the predominant form of energy - hence the Government's drive for a fourfold increase in low carbon electricity generation to meet the anticipated doubling of electricity demand over the coming decades.
- 16.4 If the new local and national carbon targets are to be achieved, natural gas is quickly becoming an unsustainable option for all. It is therefore proposed to carry out a fundamental review of what the Council is prepared to offer its residents in terms of a heating/hot water solution/s. Clearly, as part of any options review, the Council also needs to consider its statutory obligations and how, at the same time, it can minimise the ongoing maintenance and compliancy liabilities. Options include:
- a) Air Source/Ground Source Heat Pumps – These offer significant savings in carbon over natural gas and have emerged as a favoured solution for some landlords. They are also proposed as the primary heating solution for new build housing in the proposed Development Strategy (see CAB3291 elsewhere on this agenda). However, their deployment as individual (non-communal) heating systems can be limited/restricted. They may not be appropriate for many of the Council's flats and remain an expensive solution compared to electric heating. Over 70 air source heat pumps have been installed in Council dwellings to date (the majority supported by grant funding) with mixed results from tenant's viewpoint with concerns relating to running costs. No ground source heat pump systems have been installed to existing homes and any system would require significant groundworks. Some trials are being established nationally and options for a local trial are being reviewed. These systems still rely on "wet" distribution systems and specialist maintenance regimes (maintaining existing gas systems costs the HRA in excess of £600k annually).

Heat pumps are viewed by Government and many national experts as the solution to carbon reduction/replacing gas for existing homes. However, they are not currently an affordable solution for the Council and will require significant grant funding if chosen as the primary solution for replacing the 4,000 gas systems.

- b) Electric heating – Electric standalone space heaters come in a variety of options - the majority of which provide instant and focused heat as and when needed. The Council currently install “Quantum heating” and mega-flow pressurised hot water cylinder with emersions where gas is not available. However, Infra-red heating is emerging as another efficient, highly controllable and low carbon heating option. Whilst not new technology, the latest heaters may prove to be a good alternative to “quantum heating” at a similar cost.

Electric heating is currently more expensive to run than gas heating (estimated at up to 30% higher) and the costs to tenants will be a key factor in determining any long term solution. When combined with “fabric first” insulation improvements and the decarbonisation of the national electricity grid, electric heating could provide an affordable solution to achieve net zero or near net zero carbon

- c) Other fuels – The potential to replace existing gas systems with similar technology operating on hydrogen or other fuels is currently being trialed albeit at an early stage with little data on which to base future investment decisions.

16.5 It is arguably too early to determine the best long term heating solutions for the Council’s Housing stock. However, to achieve carbon neutrality by 2030, replacement programmes will need to start very soon. It is therefore proposed to use 2021 to assess progress with national trials, determine detailed options, review funding opportunities and make final recommendations for phasing out gas replacement programmes as soon after 2022 as possible.

16.6 To bring forward that review, it is proposed to establish a member/tenant/officer panel to bring forward recommendations in consultation with TACT and the Business and Housing Policy Committee.

## 17 Renewable Energy Generation

17.1 The Council, has previously considered proposals for large scale solar PV installation, at the time funded largely from energy tariffs. With tariffs no longer available, solar PV schemes are in the main funded by savings in electricity bills. However, this approach is only appropriate for communal areas of social housing where the Council still controls energy usage and pays meter bills.

17.2 Whilst the £15.7m provision for energy measures is a substantial sum, it is unlikely even to meet the full cost of bringing all properties up to a minimum of an EPC rating of C. For a small number of properties, installing solar PV may be required to achieve this standard although in most cases, improving insulation is the most accost effective approach.

- 17.3 In the absence of a funding solution, a large scale programme of solar PV is unlikely to be an option for the Council's homes. However, it is proposed to allocate £187,000 of the 2021/22 programme to support the installation of solar PV on suitable roofs of sheltered and communal housing schemes, making a positive contribution towards reducing the Council's own carbon footprint by 2024.

## 18 Tenants Energy Use

- 18.1 Whilst this programme is specifically aimed at improving properties in order to reduce energy demand, there is also scope to reduce demand through behavior change and switching to renewable energy tariffs. Alongside this programme, the new Energy Officer resource, Tenant Involvement team and Tenancy Sustainment teams will work with partners to support and encourage tenants to reduce energy bills through advice, switching providers and implementing simple energy efficiency measures.

## 19 The "Net Zero Collective"

- 19.1 The Net Zero Collective is a group of property service businesses, manufacturers and building owners (including local authorities, social housing and private businesses) who are working together with researchers and the University of Southampton to identify solutions to the challenge of decarbonising UK buildings.
- 19.2 It is proposed that the Council join the Net Zero Collective and the new Energy Manager post liaise directly with the partnership to ensure early findings are used to inform the work of the Council's panel over the next year.

## 20 Conclusions

- 20.1 Simply bringing the properties with an EPC rating of D or below up to at least an EPC of C will require more funding than has currently been identified (an estimated £25m compared to the current budget of £15.7m). However, the "fabric first" approach proposed in this report is essential if further investment (whether from the HRA or Government grant) is to be spent effectively.
- 20.2 Over the course of the next year to 18 months, the Council will need to identify solutions for the replacement of gas heating systems.
- 20.3 A solution based on electric heating has the potential to be wholly HRA financed (existing heating system replacement budget plus savings from reduced maintenance costs). Running costs may be higher for tenants although this could be mitigated by the "fabric first" insulation improvements. This solution would achieve significant carbon savings immediately but would rely on the decarbonisation of the national grid and all electricity supplies to

be renewable sources. It would result in increased demand on the grid at a time when part of the national solution is to reduce demand.

- 20.4 A solution based on heat pumps being the primary heating system for most properties will achieve higher carbon savings but will only be fundable subject to national funding programmes.
- 20.5 This report is not able to provide solutions for achieving net carbon neutrality from the Council's Housing stock and significant additional investment will be needed for this. However, it does recommend proposals for the early part of the programme and establishes a panel/forum to help drive the analysis and assessment required to develop the programme in the longer term.

## 21 OTHER OPTIONS CONSIDERED AND REJECTED

- 21.1 The option of investing the £15.7m budget provision on installing heat pumps to replace obsolete gas boilers has been considered. However, heat pumps do not provide effective heating solutions in properties with a poor energy rating and so this cannot be recommended ahead of completing the "fabric first" improvements.

### BACKGROUND DOCUMENTS:-

#### Previous Committee Reports:-

None

#### Other Background Documents:-

None

### APPENDICES:

Appendix A - Energy Related Maintenance Priorities (since 2016 to date)  
 Appendix B - Energy Efficiency and Environmental Impact - WCC Stock  
 Appendix C - Modelled annual energy bills by EPC banding  
 Appendix D - Insulation options, estimated costs and retro-fit impact  
 Appendix E - Heating Type - Estimated Capital/Revenue Costs  
 Appendix H - Impact on carbon & running costs by spending £1m p.a.  
 Appendix J - Energy related funding & grants

Maintenance Priorities in place since 2016 (which either directly or indirectly have an impact on energy use/carbon emissions):

- new heating systems - only choice to be gas or quantum heaters
- upgrade existing storage heaters with quantum heaters
- decommission/remove solid fuel appliances, open fires and associated flues/chimneys at every opportunity
- remove any other secondary heating systems/appliances
- replace key elements (boilers; doors; windows; etc. ) with the latest energy efficient equivalents
- upgrade/enhance insulation to lofts and cavities
- only fit PV to significantly improve a very poorly (EPC) rated property
- external wall insulation only to be considered if significant external grant funding available
- offer secondary double glazing option to designated properties
- unless for medical need, showers not to be provided/offered
- continue to fit mechanical extract fans to kitchens and bathrooms

**Energy Efficiency and Environmental Impact - WCC Stock**

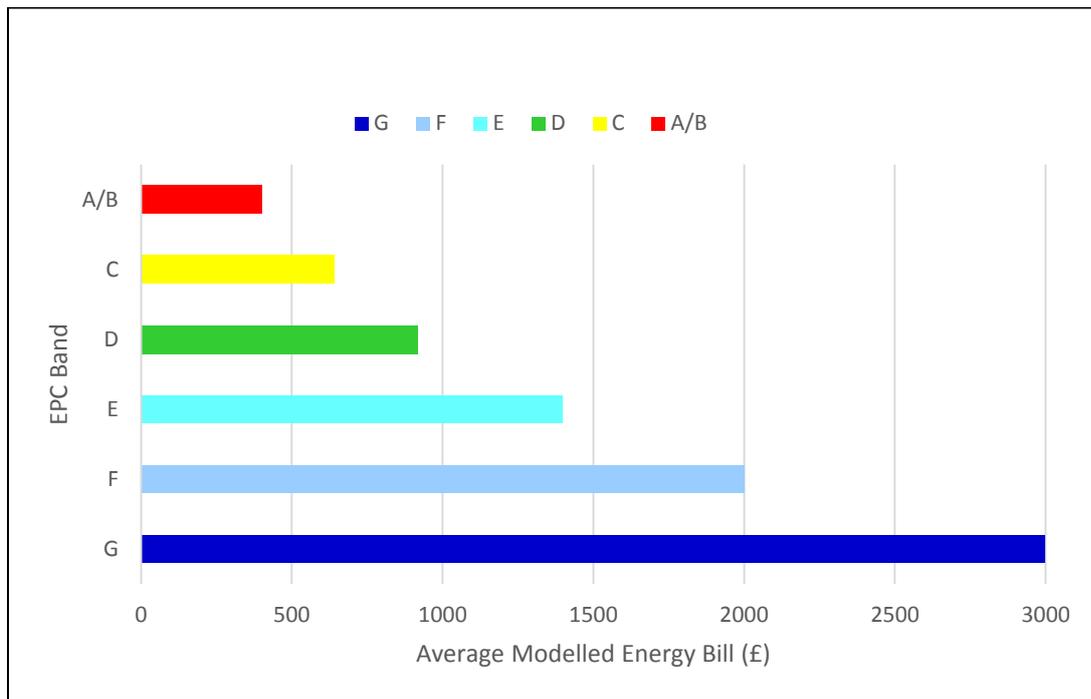
<b>BAND</b>	<b>Energy Efficiency (Running Costs) % of stock</b>	<b>Environmental Impact (Carbon) % of stock</b>
<b>A</b>	1%	2%
<b>B</b>	3%	6%
<b>C</b>	57%	42%
<b>D</b>	38%	41%
<b>E</b>	1%	8%
<b>F</b>	0%	1%
<b>G</b>	0%	0%

(Average Band C)

(Average Band D)

(Above figures as at January 2021)

Modelled annual energy bills by EPC banding (2018/19 English Housing survey )



## Insulation options, estimated costs and retro-fit impact

<b>Insulation Element</b>	<b>Est. works cost (3 BED S/D House)</b>	<b>Proportion in existing stock (Excl. New Builds)</b>	<b>Retro-fit impact on tenant</b>
External wall insulation (EWI)	£10/15,000	0%	Moderate
Internal wall insulation (IWI)	£ 5/10,000	<1%	Significant
Roof (loft) insulation (50mm+)	£ 200/£300	99%	Low
Floor insulation	£ 2/3,000	0%	Significant
Windows (new A+ rated)	£5,000	<1%	Low
External Doors (new A+ rated)	£600	<5%	Low

Heating Type - Estimated Capital/Revenue Costs

	<b>infrared panel heater</b>	<b>quantum</b>	<b>ashp</b>	<b>gas combi</b>	<b>gas system boiler</b>	<b>electric system boiler</b>
<b>TOTAL CAPITAL / INSTALL COST</b>	4290	5720	8193	4629	5347	5868
<b>ANNUAL 3* MAINT INCL SERVICE VISITS</b>	0	0	330	130	130	330
<b>WET SYSTEM / RADS</b>	0	0	2860	2860	2860	2860
<b>ROOM HEATERS</b>	2930	4541	0	0	0	0
<b>CYLINDER</b>	1010	669	1156	0	699	1010
<b>BOILER/CONTROLS/WIRING</b>	350	510	4177	1769	1788	1998
<b>BOILER/ HEAT SOURCE LIFESPAN (YEARS)</b>	20	30	15	15	15	20
<b>CYLINDER LIFESPAN (YEARS)</b>	15	15	15	0	15	15
<b>WET SYSTEM LIFESPAN (YEARS)</b>			40	40	40	40
<b>ANNUAL EQUIVALENT SYSTEM COST</b>	£231.33	£212.97	£757.03	£319.43	£367.30	£568.73

**Impact on Carbon & Running Costs by spending £1m per annum**

<b>(comparison against a 3-bed-gas heated property)</b>	<b>Carbon Saved (t)</b>	<b>Running Cost (est. % saving)</b>
(Fabric) Upgrade existing windows and doors (d/g)	22	3%
(Fabric) Upgrade existing windows and doors (t/g)	28	5%
(Fabric) Insulate ground floor	30	4%
(Fabric) External wall insulation	19	6%
All fabric	24	14%
Quantum heating	193	-33%
(Renewable energy) PV	57	19%
(Renewable energy) Solar water heating	76	6%
(Renewable energy) ASHP	228	-6%
(Renewable energy) GSHP	151	-17%
(Package) Windows + ASHP	152	-1%
(Package) Windows + ASHP + PV	135	19%
(Package) All fabric + ASHP + PV	75	32%

Energy funding

Scheme	Scope	Social Housing	Private rented tenants	Private Landlords	Owner-occupier	Non-domestic / Public sector buildings	Eligibility / Notes
LEAP (Local Energy Advice Partnership)	Energy advice service. Income / debt advice. Home visit by energy advisor. Can install simple measures. Refer on for heating / insulation requirements.	Yes	Yes	No	Yes	No	Low Income Health or Vulnerability
Warm Homes Discount	One-off £140 discount to electricity bill. (No impact on cold weather/winter payments).	Yes	Yes	No	Yes	No	Guarantee Credit element of Pension Credit). Low income.
ECO3	Funding for low income, fuel poor, or vulnerable households to help with measures to keep their homes warmer, reduce their energy bills, reduce carbon emissions.	Yes	Yes, with landlords permission	No (Eligibility based on tenant)	Yes	No	Extended from 2022 to 2026. For Social Housing, SAP Band E, F, G (Band D only for 'innovation' schemes) Private tenants and homeowners in receipt of eligible Benefit or Warm Homes Discount, Help To Heat Group. Identified as fuel poor or vulnerable to the cold under a Local Authority Flexible Eligibility Statement of Intent.
Domestic Renewable Heat Incentive (RHI)	BEIS / OFGEM financial scheme to promote the use of renewable technologies in domestic homes.	Yes	No	Yes	Yes	No	Specific eligible renewable technologies that only serves a single home, which has a domestic EPC. Payments are based on the lower of the annual heat demand figure on EPC, or the heat demand limit. Payments every 3 months for 7 years.

Scheme	Scope	Social Housing	Private rented tenants	Private Landlords	Owner-occupier	Non-domestic / Public sector buildings	Eligibility / Notes
							Currently extended to March 2022.
Non-Domestic Renewable Heat Incentive (RHI)	Financial incentives for the uptake of renewable heat by businesses, the public sector and non-profit organisations	Yes, potentially, if district heating serving multiple homes.	No	No	No	Yes	Specific eligible renewable systems in commercial, public or industrial premises, hospitals, schools and organisations with district heating schemes where one heating system serves multiple homes. Payments every 3 months for 20 years based on the amount of heat generated. Currently extended to March 2022.
BEIS - Green Homes Grant – Voucher / LAD (Local Authority Delivery scheme)	Funding towards the cost of installing energy efficiency and low-carbon heating improvements to eligible homes	Yes Max £5000, to 2/3 cost of works to eligible homes.	No (via landlord)	Yes. Max £5000, to 2/3 cost of works to eligible homes.	Yes. Max £10,000 / 100% of works if in receipt of eligible benefits.	No	Homeowner. Landlord – Local Authority or Housing Association Landlord – Private Sector Phase 1A – SAP Band E,F,G Low income household £30k Phase 1 B – SAP Band E, F, G, will be favoured (D subject to strategic fit, focus still on E-G). Low income £30k / £20k after housing. Phase 2 – (via local Energy Hubs), details tbc Expect SAP Band E, F, G – Band D to be included, possible cap at 50%. Low income £30k / £20k after housing.

Scheme	Scope	Social Housing	Private rented tenants	Private Landlords	Owner-occupier	Non-domestic / Public sector buildings	Eligibility / Notes
							Cannot exceed the de minimis state aid threshold of €200,000. Contractors must be Trustmark and PAS, MCS. Completion by March 2022. Delivery subject to November 2021 spending review.
Social Housing Decarbonisation Fund 'Demonstrator' (SHDF Demonstrator)	Scheme now closed. To demonstrate innovative approaches to retrofitting social housing at scale.	Yes	No	No	No	No.	Scheme applications closed. £50mill Demonstrator fund to catalyse innovation in retrofitting for the Social Housing Decarbonisation Fund, for which the manifesto committed £3.8 billion of new funding over 10yrs. Further details awaited.
BEIS - Salix - Public Sector Decarbonisation Scheme Grant Funding	Improve energy efficiency of eligible buildings by installation of low carbon heating or energy demand reduction measures	No	No	No	No	Yes	Scheme applications closed. Public sector non-domestic buildings. Applicant is utility bill payer and will benefit from savings. (For future rounds, landlord operated communal areas need to be clarified, could be deemed that residents rather than landlord benefit from savings via service charges).