

CREATING A RETROFIT TASK FORCE TO DELIVER ZERO CARBON SOLUTIONS

Project Proposal

University of Brighton & Lewes District Council



1. Proposal Summary

The zero-carbon retrofit challenge is immense and before we each commit to an asset management investment plan to tackle this, we need to have better certainty on how well our HRA resources will be used, ensuring that whatever we spend over the next 8 years actually makes the impact we want. There have been past programmes of decarbonising which have had varied degrees of success, with national initiatives starting and stopping. However, building on local commitments to be zero-carbon, there appears to be a new national impetus to decarbonise homes, with some new funds to support it

This proposal seeks to set up a task force that will short-list practically focussed zero-carbon solutions that will be suitable for our housing – doing what is right for our stock and what is affordable. It will also put GBEB in a good position to maximise any additional funding streams and fast track the green revolution, future proofing our local supply chains and built environment.

Greater Brighton has always been a leader in developing cross-authority initiatives and this proposal would put the region ahead of other public-sector consortia both in terms of maximising economic benefits from early development of the decarbonisation market and in contributing to the Government’s wider green agenda.

Collaboration across authorities, academic institutions and other bodies would also facilitate a holistic approach. Management of this through a working group, established with appropriate terms of reference, and following established project management principles would ensure the most efficient use of resources.

The key questions that will be asked by the task force in developing the short list of asset solutions are:

- 1) What can we use from the current menu of solutions and research?
- 2) If we were to use these off the shelf solutions, can we afford it, do they promote zero-embedded carbon, and will the supply chain be able to meet the 2030 target?
- 3) If we can’t afford it, or the supply chain has capacity or carbon issues, what alternative, innovative and more cost-effective solutions can we develop?
- 4) What support will the Government offer to reduce the burden, either through grants or taking responsibility for developing regional infrastructure (either heat or hydrogen networks)
- 5) Whatever the final outcomes are for our housing stock, how can they contribute to mass scale decarbonisation across our region, including private sector housing and commercial buildings, and how does it support the long term transition to green-jobs and low-carbon industries¹

¹ The Institute for Public Policy Research (IPPR) produced a key document in July 2020 which sets out that, by 2035, up to 275,000 jobs could be created in England by decarbonising social housing stock.

To highlight the potential scale of opportunity locally, the Greater Brighton City Region has an estimated 1.34% of all construction jobs in England. If we apply that proportion to the IPPR’s analysis, then it suggests that up to 3,678 additional direct jobs could be created in Greater Brighton by 2035

Bringing the work into a single place and partnering with the University of Brighton, instead of each council contracting it out individually to other consultants, puts it on an impartial footing seeking out objective, collective, evidence-based solutions.

This work will last 12 months, although we expect to see tangible outcomes that will shape the future asset plans within the first 6 months.

Outputs:

An underlying key assumption is that the case for decarbonising housing has already been made, with partners committed to following this path and is one of the initial GBEB 10 pledges. Therefore, this project focuses on the how and **what** rather than the **why**. This is a project focussed on practical solutions which will also consider the local supply chain and suggest how to address current local limitations as well as what skills and training are needed through engaging strategically with key stakeholders. Depending on the outcome of the evidence-based options analysis, possible practical suggestions could be:

- Double up fabric renovations and space improvements with thermal efficiency improvements e.g. wrapping flats with a new glazing layer to trap heat and provide additional covered balcony space.
- Challenge the pricing of Air Source Heat Pumps with the size of our combined stock – seeing it drop to a level that that makes them an affordable solution for much of estate.
- Challenge the need to invest in local authority led green heat if a regional investment in hydrogen will be more cost effective.
- Change the way we re-wire our lighting, going from a double switch to a single switch. It's a small change for the tenant but a significant change for us and could halve the amount of copper we use, saving on costs and environmental impacts.

Some of the key outputs are listed below and with a full list provided in Section 8. The final result will be a Zero Carbon Asset Management Plan (tool-kit) which will be a practical guide for each Local Authority on how to deliver a retrofit programme tailored to their own stock.

- Identify what could be the range of fabric improvements for building stock of the local councils, based on archetypes and best practice.²
- Identify all technically possible heating and power configurations and solutions, based on archetypes and best practice. This will include local energy systems.
- Provide detailed working method statements/ performance benchmarks/ ways of doing for contractors based on above best practice and optimum solutions from the modelling.
- Suggest future construction method statements that can be improved to save costs and wastage – for greatest impact there could be agreed common methods across the GBEB local authorities.
- Provide an assessment of installing solar PV to meet power and/or heating demands as a possible 'offset' solution.

² Demolishing existing and building new homes, is not feasible due to financial, political and logistical challenges. Construction activity also results in carbon emissions - with approximately 11% of global carbon emissions being created from the manufacture and installation of the materials used to create our buildings. Therefore a programme of retrofitting housing stocks is required.

- Provide an assessment of upgrading infrastructure to enable hydrogen to be used for heating – to enable cost benefit analysis of central Government intervention v local government intervention.
- Define objectives for new green skills training, apprenticeships, undergraduate & post-graduate learning across the region.
- Suggest benchmarks for low carbon performance of retrofitted housing stock.
- Define requirements for green, Climate Literate industry and supply chain.
- Review of best practice including literature review for best practice and cost of retrofit in UK and Europe including levels of thermal insulation upgrade, fabric air tightness, renewable technologies, and internal air quality.
- Summary and analysis of Government policy on zero-carbon retrofit and hydrogen and how this will affect any Local Authority roll-out.
- Tenant surveys

Overview of programme elements:

1	Mobilisation, contracts and appointment
2	Knowledge transfer and best practice review
3	Define fabric and energy options for onsite, local and regional needs
4	Define construction method statements and options for efficiencies
5	Cost benefit analysis of 2 to 4
6	Investment readiness of tenants, Councils and supply chain (inc OEMs)
7	Ability of regional supply chain and training sector to contribute to low carbon solution
8	Define training and supply chain needs to gear up
9	Zero Carbon Asset Management Plan

The programme would start in June 2021 (to start some of the mobilisation work) with an estimated total GBEB budget of £304k.

The work is essentially built around a core team of two posts that will do most of the programme’s heavy-lifting – one from the University of Brighton and the other from the Lewes District Council. This will be supported by officers from each of the Council’s asset management teams and other specialists – this reflects the practical nature of the research and that the outputs are directly transferable to each Council’s asset management plans

Lewes District Council is providing project, administrative, and legal support at no cost to GBEB partners.

This work will also compliment, promote, and accelerate any research work that is currently being carried out by GBEB local authorities e.g. Net Zero Collective, Solarise, Clean Growth UK, Carbon Hub.

Changes made since the March submissions are summarised in Annex 4.

2. Why collaborate?

To do this research properly requires a significant investment and it will be difficult for any authority to do it on its own. Also by working as collaborative block we can:

- better exchange of knowledge and expertise
- not duplicate effort
- make better use of our limited HRA resources
- have a greater influence the supply chain, industry, and Government policy
- potentially increase our purchasing power
- maximise any grant funding opportunities
- create the opportunity to provide solutions for the rest of the UK

3. Why the University of Brighton?

Whilst the University of Brighton is not alone in developing solutions for the zero carbon retrofit market, it is one the UK's leading establishments in this sector and has a proven track record in delivering commercial ready solutions through its Clean Growth UK.

The University of Brighton has knowledge of the latest retrofit research, working methods, training & best practice, and it is also central to the GBEB area.

One of the programme's core team is Duncan Baker Brown a leading UK sustainability architect based in the area and also a senior lecturer in the University's School of Architecture.

4. Who else will be involved?

This is very much a collaborative programme, bringing in leading people and organisations across the country to solve the fundamental issue of what is it we can do and what it will cost.

The programme will have two knowledge streams:

- 1) Core team of the two posts, Council staff and specialists, listed in Annex 1
- 2) Other specialists as part of a 'Knowledge Transfer Network' –listed in Annex 2 and will include could include representatives from local and regional agencies, national government, social landlords, building authorities, research expertise, education and skills providers, energy suppliers and industry experts.

The 'Knowledge Transfer Network' will be important as it will enable the sharing of detailed research that Local Authorities and other organisations are carrying out and no-cost data sharing agreements will be pursued as this will be mutually beneficial for all parties to get to zero carbon as quickly as possible. The mobilisation period will ensure the 'Knowledge Transfer Network' is properly defined and all parties are in agreement on expectations and consequences e.g. protection of any IP or commercially sensitive information.

The number of supporting organisations may grow as a result of the initial best practice scoping in workstream 2.

The proposed research programme could still succeed with a small number of knowledge transfer partners.

5. What is being sought from GBEB partners?

For each GBEB partner we are seeking a financial contribution relative to their housing stock and staff resource to attend officer technical groups over the next 12 months. This cost could be reduced if we were able to invite other local authorities from across Sussex.

It is proposed that Lewes District Council is the project administrator for GBEB and in addition to providing its financial contribution, it will be providing a dedicated staff resource of £61k (not being charged to GBEB partners).

This budget may not be called upon if project gateways do not recommend the programme continues.

6. What are the timings & cost?

The table below summarises the works streams and costs, more detailed tables are given in Annex 3 including a breakdown by workstream, month, and organisation.

It is proposed that Lewes District Council hosts this work and is the project administrator for GBEB. With this arrangement Lewes District Council would provide project, meeting and legal support and all procurement would be covered by its Contract Procurement Rules.

Lewes District Council would seek to procure separately each of organisations that support this work. The majority would be subject to competitive tender however a few would be appointed directly as it is the individual's expertise that the project is seeking to acquire – a key direct appointment would be the University of Brighton who would be the lead research organisation for the project and be represented by Duncan Baker Brown.

Breakdown of costs and workstreams

Workstream		Cost
1	Mobilisation, contracts and appointment	13,140
2	Knowledge transfer and best practice review	46,100
3	Define fabric and energy options for onsite, local and regional needs	144,647
4	Define construction method statements and options for efficiencies	21,800
5	Cost benefit analysis of 2 to 4	22,750
6	Investment readiness of tenants, Councils and supply chain (inc OEMs)	23,700
7	Ability of regional supply chain and training sector to contribute to low carbon solution	10,950
8	Define training and supply chain needs to gear up	10,300
9	Zero Carbon Asset Management Plan	10,100
Project Management - included in above as sunk cost		0
Total		303,487
LDC costs		60,500
Excluding LDC costs		242,987

Potential financial ontributions per LA based on 2019/20 housing stock

GBEB Only

	Nr Homes	% of total	Project sliding scale contribution
Adur	2,542	8.8%	21,449
Arun	3,380	11.7%	28,520
BHCC	11,573	40.2%	97,652
Crawley	8,072	28.0%	68,111
Lewes	3,199	11.1%	26,993
Mid-Sussex	31	0.1%	262
Worthing	0	0.0%	0

28,797	100%	242,987
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Flat rate	34,712
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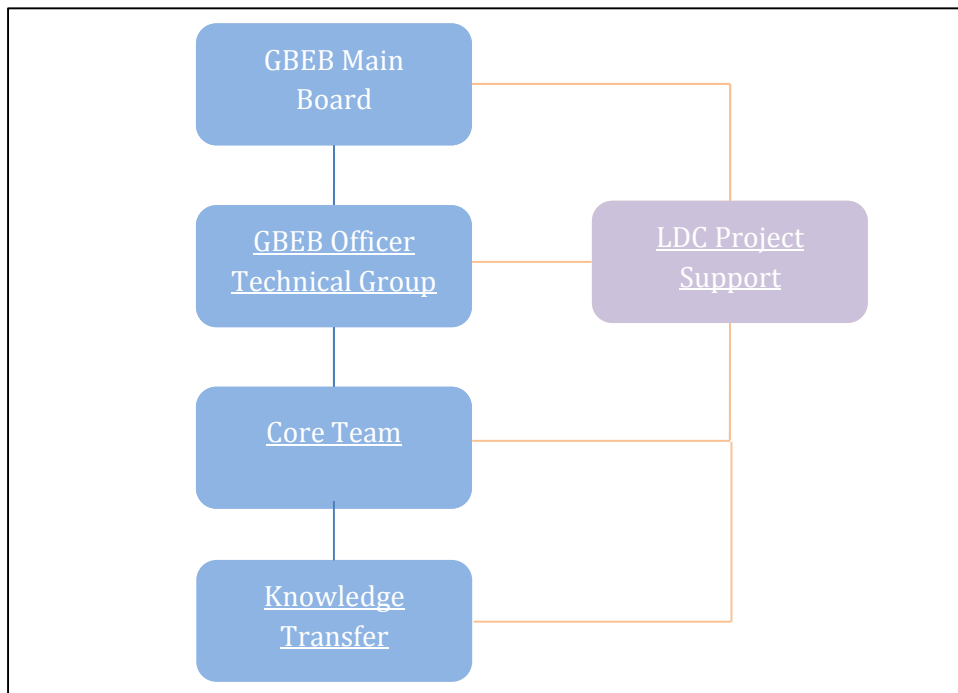
Wider Sussex

	Nr Homes	% of total	Project sliding scale contribution
Adur	2,542	7.2%	17,560
Arun	3,380	9.6%	23,349
BHCC	11,573	32.9%	79,946
Crawley	8,072	22.9%	55,761
Lewes	3,199	9.1%	22,099
Mid-Sussex	31	0.1%	214
Worthing	0	0.0%	0
Eastbourne	3,437	9.8%	23,743
Wealden	2,941	8.4%	20,316

35,175	100%	242,987
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Flat rate	26,999
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7. Governance



A new GEBB Officer Technical Group would be set up and have representatives from each participating Local Authority. This group would oversee the programme work and provide updates to the main GEBB board.

The programme would be led by the core team supported by the resources and specialists set out in Annexes 1 & 2.

Lewes District Council would provide administrative support for this work.

8. What are the key work packages and outputs?

There are nine work packages, listed below together with the expected outputs. Annex 3 identifies in more detail who will be involved in each work package, when it will be delivered and the costs.

1. Mobilisation, contracts and appointment
 - a. Draft the detailed specifications of works
 - b. Put in place contracts for all external appointments
 - c. Set up the programme Governance
 - d. Purchase any required software and licences
 - e. Initial knowledge transfer agreements
2. Knowledge transfer and best practice review
 - a. Undertake literature search for best practice and cost of retrofit in UK and Europe including levels of thermal insulation upgrade, fabric air tightness, renewable technologies and internal air quality.

- b. Ascertain Government policy on zero-carbon retrofit and hydrogen and how this will affect any Local Authority roll-out
 - c. Undertake detailed research into relevant retrofit best practice projects
 - d. Undertake detailed research of low to zero embedded carbon materials
 - e. Understand current housing stock data tenant make-up
 - f. Identify a common set of architypes across the stock
 - g. Capture potential challenges associated with Planning Regulations, Building Regulations, Highways, Environment Agency, Ecology, Heritage and Conservation
 - h. Capture emerging TRL technologies that could accelerate zero carbon solutions
 - i. Capture procurement solutions for Local Authorities
 - j. Capture market solutions for stock energy assessments
 - k. Continue knowledge transfer agreements
3. Define energy options for onsite, local and regional needs
- a. Identify what could be the range of fabric improvements for our building stock, based on architypes and best practice
 - b. Identify all technically possible heating and power configurations and solutions, based on architypes and best practice. This will include local energy systems.
 - c. Carry out an energy modelling options analysis of above variations, using the dynamic energy modelling solutions found in 2.g and leading ones currently available including EnergyPlus, IES, & Poweriver. This will ascertain which software can be trusted as a benchmark and what solutions will be viable for future zero-carbon roll out
 - d. Benchmark modelling to SAP, Building Regulations, EPCs and w/m2
 - e. Benchmark private sector housing and commercial buildings and see how the conclusions from a-d can help private sector housing and commercial buildings with decarbonisation ³
 - f. Assess cost of installing solar PV to meet power and/or heating demands as a possible 'offset' solution
 - g. Assess cost of upgrading infrastructure to enable hydrogen to be used for heating – to enable cost benefit analysis of central Government intervention v local government intervention
4. Define construction method statements and options for efficiencies
- a. Defines detailed working method statements/ performance benchmarks/ ways of doing based on above best practice and optimum solutions from the modelling
 - b. Identify future construction method statements that can be improved to save costs and wastage?
 - c. Cost out current and future retrofit solutions
5. Cost benefit analysis of 2 to 4
- a. Detailed cost benefit analysis of different retrofit solutions and associated costs, based on findings of work streams 2 to 4. To include capex and opex and utilise current asset management software e.g. Keystone.
 - b. Identify impact on carbon based on current budgets and any shortfalls on reaching zero-carbon

³ Private homes, commercial property all have their part to play in the decarbonisation agenda. This has not been addressed by GBEB at present. There is a gap which isn't easily addressed at this point in time.

- c. Comparison of local v national intervention e.g. development of hydrogen network which can spread costs up to 60 years.
6. Investment readiness of tenants, Councils and supply chain (inc OEMs)
 - a. Research what behavioural change is required in tenants, contractors & supply chain and 'clients' to enable successful future roll-out.
 - b. What are the regulatory issues and Government policies that could be a barrier or opportunity for any deployment of the solutions?
 - c. Tenant surveys of measures that have already been installed, what their benefits were and how this can be applied to future programmes
 - d. Tenant surveys of climate change and paying more towards building improvements to lower the bills
 - e. Tenant attitudes to other sustainability items such as cleaner transport, food growing and consumerism
 7. Ability of regional supply chain and training sector to contribute to low carbon solution
 - a. What businesses are in Sussex that can practically be part of the supply chain – cross check above outputs to Sussex businesses?
 - b. Identify the gaps and the impact this could have on any roll-out
 - c. What are the best procurement options for GBEB (and wider Sussex LAs) and contractors
 8. Define training and supply chain needs to gear up
 - a. Defines objectives for new green skills training, apprenticeships, undergraduate & post-graduate learning across the region
 - b. Defines benchmarks for low carbon performance of retrofitted housing stock
 - c. Defines requirements for green, Climate Literate industry and supply chain
 9. Low Carbon Retrofit Roadmap
 - a. Report on how GBEB and other Sussex Local Authorities can practically take forward a zero-carbon roll out, identifying any gaps in how full zero-carbon can be achieved

Annex 1 – Core Programme Group

Organisation Key	
A	UoB, Duncan Baker Brown, Project partner
B	LDC, Nick Adlam, Project manager and researcher
C	University of Chester, John Counsell, Lead energy modeller and local energy systems
D	University of Brighton & Green Growth Platform, Marco Picco, Building and innovative fabric solutions
E	To be tendered, XXX, Quantity surveyor and building costs
F	University of Brighton, Jo Havers, Supply chain skills and circular economy development
G	LDC, Jo Wunch, Tenant and technology research own stock
H	LDC, Celia Cullen & James White, Procurement solutions
I	Other LA support, XXX, TBC

Annex 2- Stakeholders and Industry Experts

- BEIS
- Community Energy South
- ESCC
- External consultants and businesses
- Green Growth Platform
- Innovate UK
- LEAP – home energy visits
- LEPs
- Liverpool John Moores University
- National Grid
- Net Zero Collective
- SGN
- South East Energy Hub
- UKPN
- University of Southampton
- University of Durham
- University of Portsmouth
- Warmer Sussex (Retrofit Works)

Annex 3- Detailed Costings & Timings

Workstream		May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Cost	
1	Mobilisation, contracts and appointment		A,B,H																13,140	
2	Knowledge transfer and best practice review			A,B,C,D,E,F, G,H,I															46,100	
3	Define fabric and energy options for onsite, local and regional needs				A,B,C,D,E														144,647	
4	Define construction method statements and options for efficiencies					A, B, D, E, F													21,800	
5	Cost benefit analysis of 2 to 4							A,B,C,D, E											22,750	
6	Investment readiness of tenants, Councils and supply chain (inc OEMs)					A, B, F, G													23,700	
7	Ability of regional supply chain and training sector to contribute to low carbon solution									A, B, F H									10,950	
8	Define training and supply chain needs to gear up										A, B, F, H								10,300	
9	Zero Carbon Asset Management Plan												A, B						10,100	
																			Total	303,487
																			LDC costs	60,500
																			Excluding LDC costs	242,987

	Person	Organisation	Specialism	1 Mobilisation, contracts and appointment	2 Knowledge transfer and best practice review	3 Define fabric and energy options for onsite, local and regional needs	4 Define construction method statements and options for efficiencies	5 Cost benefit analysis of 2 to 4	6 Investment readiness of tenants, Councils and supply chain (inc OEMs)	7 Ability of regional supply chain and training sector to contribute to low carbon solution	8 Define training and supply chain needs to gear up	9 Zero Carbon Asset Management Plan
A	Duncan Baker Brown	UoB	Project partner	8	5	5	15	5	5	5	5	10
B	Nick Adlam	LDC	Project manager and researcher	15	25	25	15	15	10	15	20	15
C	John Counsell	University of Chester	Lead energy modeller and local energy systems		15	30		5				0
D	Marco Picco	University of Brighton & Green Growth Platform	Building and innovative fabric solutions		10	10	10	5				
E	XXX	To be tendered	Quantity surveyor and building costs		10	10	5	25				
F	Jo Havers	University of Brighton	Supply chain skills and circular economy development		25		5		20	10	5	
G	Jo Wunch	LDC	Tenant and technology research own stock		30				90			
H	Celia Cullen & James White	LDC	Procurement solutions	16	20							
I	XXX	Other LA support	TBC									
			Sub-totals	13,140	44,600	33,350	20,300	21,250	22,200	9,450	8,800	8,600

Project management & support	Days	Unit Rate	Total
	63	530	33,390
	155	220	34,100
	50	530	26,500
	35	530	18,550
	50	400	20,000
	65	350	22,750
	120	115	13,800
	36	350	12,600
			181,690

Solar PV potential for buildings				28,797								
Contribution to SEEH for H2 assessment				50,000								
Software purchase and licensing				31,000								
Expenses			1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Workstream Totals			13,140	46,100	144,647	21,800	22,750	23,700	10,950	10,300	10,100	

			28,797
			50,000
			31,000
			12,000
0			303,487

LDC costs	60,500
Excluding LDC costs	242,987

Change tracker between original GBEB proposal and revised proposal

Original Item	Revised Item	Why
Research assistant to be recruited for the project	LDC to provide research assistant (Nick Adlam). Will also be project manager	Already in place and up to speed with requirements.
Assess cost for introducing hydrogen infrastructure	Deleted as programme item and asking BEIS/SEEH instead to assess this – budget still needed	Require wider analysis
University of Sussex Supply Chain Support	No longer appropriate. Will use existing network to host workshops and learning events.	Save budget and use front line practitioners
National policies, barriers and regulations	Absorbed by the main team	Save budget and use existing resources
N/A	Solar Energy assessment – Absolar	Cost-effective way of obtaining potential for roof solar
Innovative energy solutions	Absorbed by the main team	Save budget and use existing resources
GBEB project support	Deleted and absorbed by the main team	Save budget and use existing resources
Supply chain assessment	Now includes investigating potential for circular economy solutions and led by Jo Havers team at UoB. Will crossover with Fabric work carried out by UoB Marco Picco	Clarity of scope
Zero Carbon Roadmap	Changed name to Asset Management Delivery Plan	Clarity of scope
National policy and barriers	Absorbed into energy modelling (now includes local energy systems) and LDC post	Clarity of scope, making better use of resources

