SHAKESPEAREMARTINEAU
Legal advice for life and business

Community Energy ‘in a box’

1. Executive summary

Decarbonising housing will require significant overhaul of the way we heat our homes both in new developments and existing housing stock. We believe community energy projects will play a key role in transforming how our future energy demands are met. While we are not yet at a point of providing ‘community energy in a box’, we have addressed some key changes required in order to get there.

As we begin to enter a regulated market for heat networks aimed at consumer protection, see a growing number of electric vehicles on the road and as energy and petrol prices continue to soar as we come out of the Covid-19 pandemic and Russian gas exports are potentially halted or curtailed, now is exactly the right time to drive these projects forward.

Existing schemes will also need support in meeting net zero targets – and crucially, social housing schemes will need to ensure that energy is affordable and energy costs are transparent, i.e. separated from rent costs, thus enabling tenants to see the true cost of heating their homes.

In this report we look at what community energy is and identify some of the barriers and challenges facing community energy projects – including public and private sector buy-in, consumer knowledge and engagement, legislative and regulatory issues, technical expertise, and the value in green electrons for both funders and consumers.

Drawing on the expertise of an esteemed panel and evidencing public attitudes with a consumer research survey, we suggest recommendations for overcoming these hurdles.

We also provide useful resources for developers and local authorities looking to implement a community energy project, including case studies and a ‘how to’ checklist.

This report has been commissioned and produced by Shakespeare Martineau and is supported by Marrons Planning.

2. The problem

How do we solve a problem like carbon emissions?

Heating homes, workplaces and public buildings contributes almost a quarter[1] of all UK emissions.

Latest figures[2] from the Office for National Statistics (ONS) show that households are the highest contributors to overall UK greenhouse gas emissions. And analysis[3] of the current market shows that if the energy price cap rises in line with up to date wholesale prices, household spending on heat and power would rise to **6.8%** - the highest level since 1970.

The analysis also shows that lowest income families would be hit hardest; experiencing as much as **13%** of total spending on energy bills.

We need change and solutions - and fast.

In response to the crisis, the government has set up a Local Supply Working Group to explore the regulatory barriers to change and Ofgem has also published a discussion paper on Non-Traditional Business Models: Supporting transformative change in the energy market[4].

The government's Heat and Buildings Strategy[1] sets out plans to significantly cut carbon emissions from the UK's 30 million buildings, with a focus on swapping gas boilers for heat pumps.

But, in research conducted by Shakespeare Martineau, nearly **2 in 5 (37%)** consumers said that if their boiler needed replacing in the next six months they would replace it with a new gas boiler.

Just **12%** said a heat pump (6% opted for air source and **6%** selected ground source heat pump) and more than a third (36%) responded with 'don't know'. See Figure 1 for full results.

Figure 1. What I would replace my boiler with if it broke down in the next six months

Gas boiler	37%
Don't know	36%
Solar powered electric heating	8%
Air source heat pump	6%
Ground source heat pump	6%
Ambient loop heat network	4%
Other	3%

In 2019, transport produced **27%**[5] of the UK's total emissions, and of this, 91% came from road transport vehicles. In a bid to tackle this issue, the government's most prominent transport plan is focussing on electric vehicles, with more than £1.36 billion invested so far.

However, just **30%**[7] of people in the market for a new property felt that electric vehicle charging points were an important feature of a green home.

Despite significant investment aimed at decarbonising the heating and transport sectors, progress towards the UK's carbon reduction goals is still slow. In 2014, the government's community energy strategy imagined that one million homes would be powered by community energy schemes by 2020. By 2018, there were just 67,000[8] homes benefiting.

And, with **80%** of buildings expected to be present in 2050 already built[9], new developments need to be better than carbon neutral to compensate for legacy neighbourhoods that will take longer and need greater investment to reach their targets.

To move forward we need to consider, amongst other things, the application of increased on-site generation and storage and the deployment of smart technologies and, crucially, how these can be rolled-out at scale.

The Department for Business, Energy and Industrial Strategy (BEIS) committee report[10] underlined that the government must communicate clearly to households that decarbonising heating and reaching net zero emissions should result in a net saving for households and protect them from volatile gas prices. However, it's felt that the government is not doing enough. As a result, industry needs to step up for the greater good.

Community energy is just one piece of the puzzle, but has a significant part to play in minimising the energy needed to heat our homes, cook our dinners, warm our baths and meet our transport needs.

3. Background

What is a community energy scheme?

Community energy is an environmentally conscious renewable or reduced energy system that is delivered by communities – either a geographical community, or shared-purpose community – in partnership with public or private providers.

What is meant by 'community'?

When we say community this can mean communities within a set location such as a village or housing estate, or a group of people in the same or different locations who are invested in a shared renewable energy project, which could be located miles away from their home.

- Entry point for community energy
- Solar, battery, hydro, wind etc.
- Electric vehicle (EV) charging points
- Waste management – e.g. energy from waste and anaerobic digestion (AD) projects
- Energy efficiency
- Biomass/green gas
- Heat networks

What are the benefits of community energy?

Community energy involves people working together to reduce and manage energy use and influence and support local generation and supply. A community energy project, which optimises resources and makes efficient use of energy, can bring about much-needed net zero infrastructure, and promote the social and cultural changes required to reduce the impact of energy use on climate change and increase energy security.

Other benefits of community energy projects include:

- Enabling locally-owned generators to sell power directly to the local community without going through the wholesale market, therefore having more control over energy prices thus facilitating lower prices for customers, which in turn helps to reduce fuel poverty
- Enabling the economic benefits of energy supply to be maximised locally, through local job creation, consequently bolstering local economies
- Helping communities meet their net zero targets
- Avoiding grid connection barriers by facilitating local supply and balancing
- Receiving a revenue stream from selling excess electricity back to the grid or neighbouring customers etc, which can be used to reinvest into the local community.

What's worked, what hasn't?

There are some very successful examples of community energy schemes. These are set out in section 6.

However, these often take a long time to deliver, due to many of the barriers. These are set out in section 4.

These challenges ought to be carefully considered by the government and barriers removed so as to facilitate the roll out of such schemes at scale – especially given the failure of recent government initiatives to support the development, retrofitting and adoption of green homes.

One example of a failed initiative is the Green Homes Grant[11] voucher scheme, under which homeowners and residential landowners in England could have applied for a voucher towards the cost of making energy efficient improvements to their property. However, applicants only had six months to apply and if they were successful in getting a voucher, it expired after three months. The BEIS closed the scheme on 31 March 2021. The BEIS had initially anticipated that the Green Homes Grant voucher scheme, through its £1.5 billion budget, would deliver home energy efficiency improvements to 600,000 homes. A report[12] published 1 December 2021 indicated that by the time all remaining vouchers are processed and paid, the scheme will have upgraded only 47,500 homes (less than 8% than predicted) and spent £256 million on the work, with the department spending £50.5 million administering the scheme.

The UK Green Deal[13], which the government introduced in 2011 aimed at improving energy efficiency in buildings by removing the upfront cost of such measures was also deemed a failure[14] by the National Audit Office. The scheme, which cost £240 million, did not generate additional energy savings as it failed to persuade householders that energy efficiency measures were worth paying for. Since 2015, the Green Deal has been effectively closed to new entrants, due to its complexity and poor take up.

Recently, the government:

- published its Net Zero Strategy: Build Back Greener[15], which sets out its policies and proposals for decarbonising all sectors of the UK economy to meet our net zero target by 2050

- published its Heat and Buildings Strategy[1] which sets out how the UK will decarbonise homes, commercial, industrial and public sector buildings as part of setting a path to net zero by 2050 – with emphasis on phasing out natural gas boilers and installing heat pumps. This includes a £5,000 grant to homeowners to upgrade their boiler to a heat pump

- established the Public Sector Decarbonisation Scheme[16] (£1 billion in Phase 1, £75 million in Phase 2 and £1.425 billion in Phase 3 to cover the period 2022 to 2025), which provides grants for public sector bodies to fund heat decarbonisation (e.g. installation of heat pumps, solar panels etc.) and energy efficiency measures (e.g. LED lighting and building management system upgrades). So far, grants have been awarded to 461 projects[17] in Phase 1 and 5418 in Phase 2; applications for Phase 3 closed in November 2021 and will see £1.45 billion of funding granted up to 2025

- announced the establishment, in April 2022, of its Green Heat Network Fund[19], a £270 million capital grant fund open to public and private applicants to help new and existing heat networks move to low and zero carbon technologies like heat pumps, solar and geothermal technology

- announced it was allocating an additional £300 million to local authorities under the Green Homes Grant Local Authority Delivery Scheme[20] aimed at raising the energy efficiency of low income and low energy performance homes with a focus on Energy Performance Certificates (EPC) of E, F or G

- established the Social Housing Decarbonisation Fund[21] of up to £800 million, which registered providers of social housing (including private and local authority providers) can apply for to improve the energy performance of their social homes (via upgraded insulation, installation of heat pumps etc). It is aimed at upgrading a significant amount of social housing stock to an EPC rating of C and above

- launched the Home Upgrade Grant (HUG)[22] to support low-income homes to upgrade insulation and install lower carbon heating. The BEIS has stated that up to 4,300 homes will benefit from the initial £67 million funding round under HUG. All upgrades should be delivered within a year, and will be offered, in the first instance, to low-income houses that are not currently connected to the gas grid and are ranked as EPC band D or lower. Through to 2025, £950 million will be allocated through the HUG scheme. 22 local authorities will receive funding

- removed VAT on energy-saving products[23] such as solar panels, heat pumps and insulation for the next five years

- published an 'energy security strategy'[24] in response to the invasion of Ukraine and a need to reduce reliance on Russian gas, with a strong focus on offshore wind, nuclear power, low carbon heating and clean hydrogen.

Even with all of this, there is still a huge gap to get to net zero. The latest Intergovernmental Panel on Climate Change (IPCC) report[25] paints a bleak picture of the global crisis and while it points out that cities are hotspots for climate impact, it also recognises the opportunity to push for renewable energy, greener transport and buildings – so facilitating the roll out at scale of community energy schemes that will play a key part in closing this gap.

4. What are the barriers (and solutions)?

Buy-in

On the face of it, we're all bought into a greener planet that benefits us and generations to come. But, in reality, energy can be placed on the 'too hard to do' pile for a number of reasons:

- Lack of understanding or knowledge
- The task at hand seems too large
- There is little consistency e.g. some regions or cities impose targets that are more stringent than the national targets
- The technology is not available
- The expertise is not available
- The costs are too high
- The notion that it's 'someone else's responsibility'
- Lack of any central forum that consolidates project owners, service providers and potential funders.

Buy-in at local authority level

The UK Climate Change Risk Assessment 2022[26] states: The evidence shows that we must do more to build climate change into any decisions that have long-term effects, such as in new housing or infrastructure, to avoid often costly remedial actions in the future.

Experts on our panel said that dedicated teams for sustainability within local authorities were grossly under-resourced. More resource is needed and furthermore, sustainability must become a golden thread through every department strategy, making all teams accountable for reducing carbon emissions. This must be evidenced publically, with successes and – crucially – failures shared to improve the learning of all.

Every project is different, so rather than starting with the tech or solution and then asking what the problem or objective is, local authorities should be taking an outcome-based approach to housing. For example, instead of tasking contractors to use heat pumps in a development, challenge them to meet a specific carbon objective by a certain time-frame and empower them to find the best community energy solution.

Local authorities should become the owners of their strategic plans for new and brownfield developments in a way that holds housebuilders accountable for meeting carbon targets – this will also encourage greater innovation and investment into novel energy efficient solutions that are also cost efficient.

- *Ensure sustainability is part of every department strategy and these results are tested*
- *Take an outcomes approach to projects, recognising each one is different.*

Housebuilder buy-in

The construction sector is always hankering after simplicity and short-term profits – but lately, supply chain issues and staff shortages are making things complex and costly for housebuilders.

Community energy and green homes add yet another layer of cost and complexity to projects and while we are seeing an increasing number of SME housebuilders developing reduced carbon projects that go above and beyond current requirements, it is unlikely to be a high priority for the bigger players in the sector. So it is important that community energy is driven by changes to legislation and client demand – as this will, in turn, lead to commitment and innovation from housebuilders. The energy security strategy hints at a legislative change in regards to design performance standards to 'make installation of renewables, including solar PV, the presumption in new homes and buildings', but detail is yet to be provided.

Furthermore, if major land owners, like local authorities, are setting outcomes-based targets for projects as outlined above, this will force the hand of major contractors to consider overall objectives and apply the appropriate energy and technical solutions in order to ensure their developments are energy efficient – rather than starting with the tech and working backwards.

Schemes can also up their commercial viability by selling their excess energy to subsidise the cost of smart technology, offsetting many developers' fears that renewables will lead to increased costs for residents, which will make it more difficult for them to be competitive against non-renewable schemes.

- *Push down to developers the outcomes approach to projects (and in turn to contractors), which will lead to investment in cost competitive and energy efficient solutions for their developments and lower energy spend for residents/customers.*

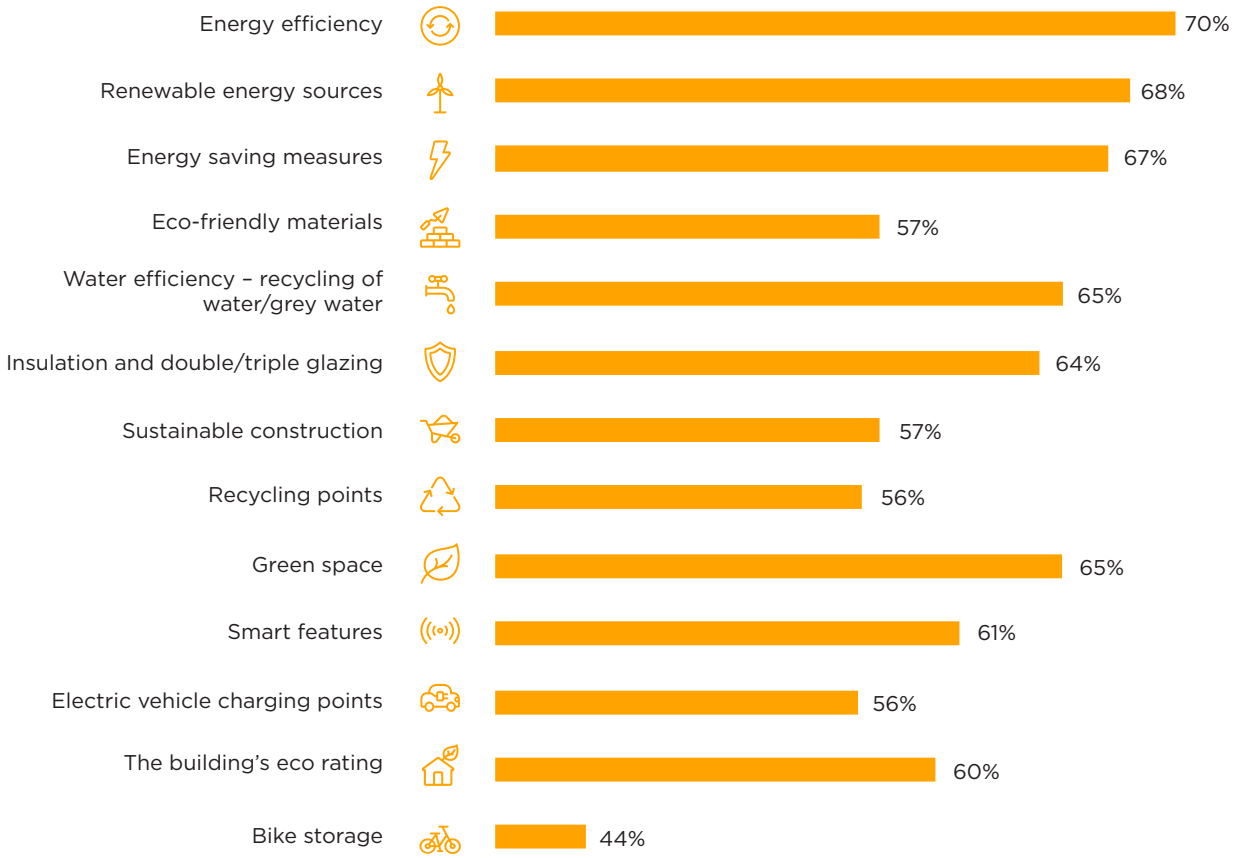
Customer buy-in that will drive supply chain

What housebuilders build will inevitably be driven by what purchasers want – and this will, in turn, steer the supply chain.

Shakespeare Martineau's 'Green Homes: What Buyers Want'[7] report showed that more than **2 in 3 people** who have recently or are looking to purchase a home in the next **12 months** are willing to pay more for 'better energy efficiency' (70%), 'to have renewable energy sources (such as solar panels, heat pumps)' (68%), and 'to have energy saving measures' (67%).

65% of first and second time buyers are happy to pay more for better water efficiency and **64%** would pay more for double/triple glazing. See Figure 2 for full results.

Figure 2. Which energy efficiency features homebuyers are willing to pay more for



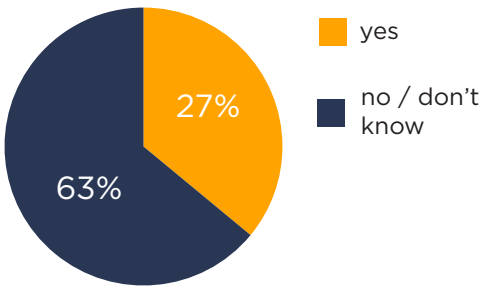
Public engagement and education will be key to achieving customer buy-in.

Our research indicated that almost two thirds (64% - combined percentage answering 'no' or 'don't know') of the population do not feel they confidently understand what a heat pump is, how it works and how they go about getting one. See Figure 3.

It's clear from our public perception research that consumers are not fully confident in what community energy is, with less than **1 in 4 (24%)** people saying they felt they had a good understanding of it.

After being provided with the Community Energy England[27] definition of what community energy is, just **35%** of people said they would be likely to consider a community energy project, while **41%** said they were neither likely nor unlikely.

Figure 3. I understand what a heat pump is

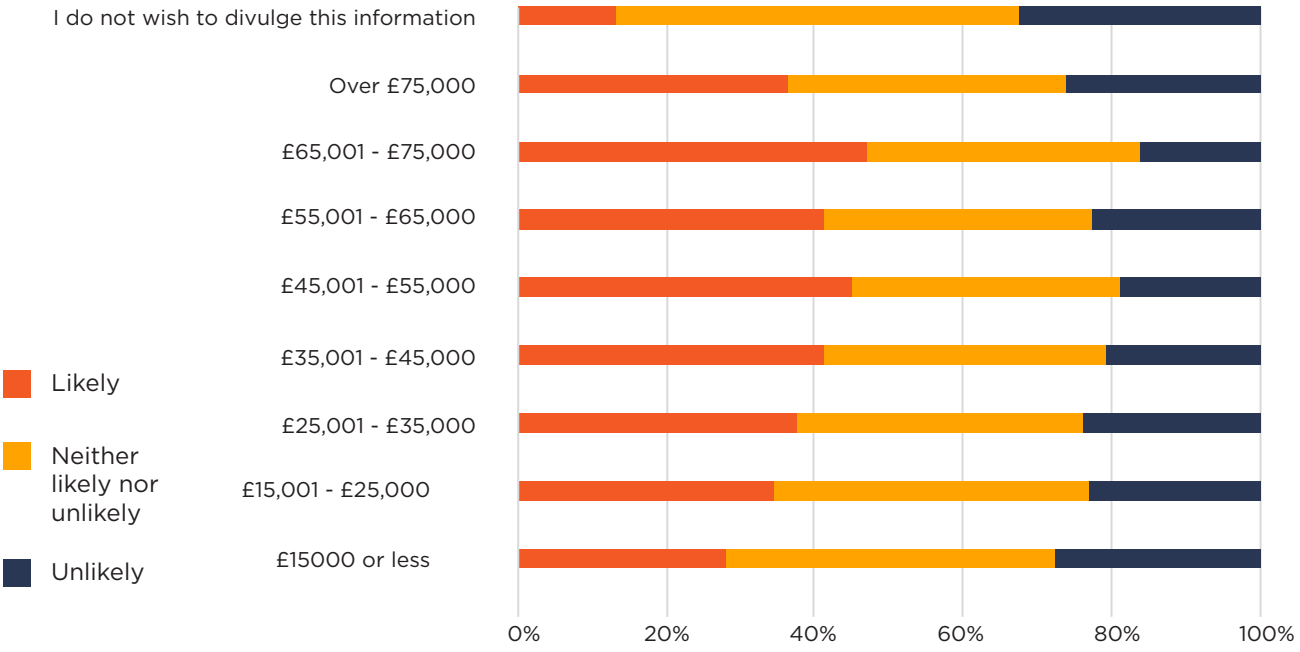


Community energy refers to the delivery of community-led renewable energy, energy demand reduction and energy supply projects, whether wholly owned and/or controlled by communities or through a partnership with commercial or public sector partners.

– Community Energy England

Interestingly, respondents with the highest and lowest incomes were the least likely to adopt community energy. Those most likely (47%) had a household income of £65,001 - £75,000. See Figure 4.

Figure 4. How likely are you to consider a community energy project?



However, there is research that shows there is an appetite for 'green homes' – as 77%[7] of people in the market to buy their first home or their next property would consider purchasing a green home.

Lack of understanding and the almost thirty-year timeframe to get to 'Net Zero by 2050' is a challenge to consumer buy-in. Given the scale of the change required and the significant influence of consumers, more must be done to improve understanding and change consumer behaviour, so they feel empowered and compelled to act.

It is therefore imperative that the government, local authorities, funders, regulators and energy industry participants (e.g. generators, suppliers, electricity distribution network operators and asset managers) work in concert to deliver an easy to understand, integrated "community energy in a box" packaged solution to housebuilders and social housing providers, which can, in turn, sell green homes on to consumers.

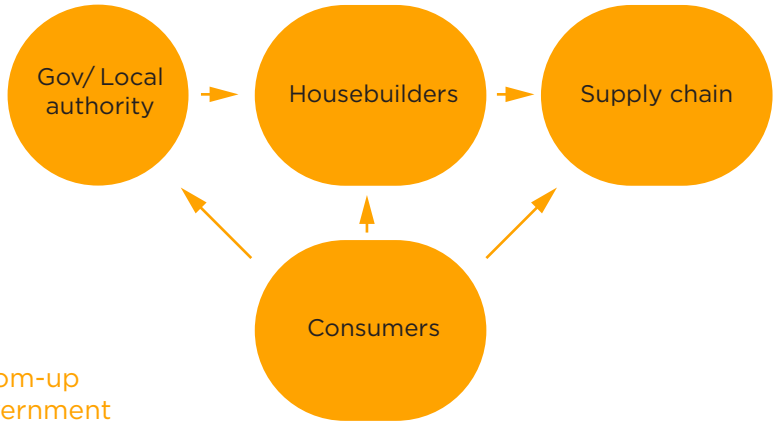


Figure 5. The flow of demand, both bottom-up from consumers and top-down from government to supply chain.

Our experts agreed that of the general public, those who are 'able to pay' should be targeted first. Other groups either cannot afford to make the changes or will be in housing where they are not responsible for maintaining energy delivery e.g. social housing.

Able to pay: consumers who have the means to pay for their own energy efficiency updates, rather than full reliance on subsidy.

The Energy Saving Trust estimates that the cost of an air-to-water heat pump is around £7,000 to £13,000[28] depending on the size of heat pump, the size of the property, whether it's a new build or an existing property and whether you need to change the way heat is distributed around a property.

Providing the above information, we then asked consumers if they thought heat pumps were an affordable option for them; just 18% said yes.

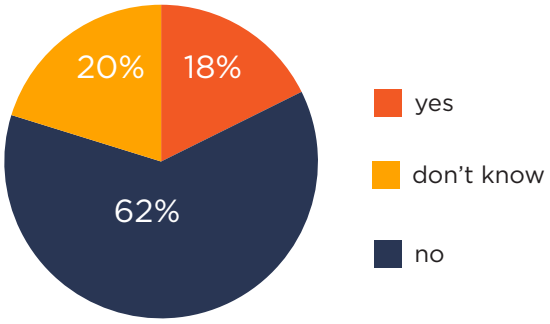
Nearly two thirds (62%) said no, and 20% were unsure. See Figure 6.

Respondents on the lowest incomes were least likely to say that it was an affordable option, with just 11% opting yes in household incomes under £15,000 and 13% of those earning £15,001 - £25,000.

According to the Office for National Statistics, the median household income in the UK was £29,900[29] in the financial year ending 2020. Respondents closest to this middle figure (those with a household income between £25,001 and £35,000) had one of the highest counts of undecided individuals; almost two thirds (65%) were neither likely nor unlikely and just 17% said it was an affordable option. Of this same household income group (£25,001 and £35,000), only 1 in 4 (25%) said they had a good understanding of what community energy was.

With the 'average' household having little understanding of community energy and only a minority of this group considering

Figure 6. Are heat pumps an affordable option for you?



low carbon technology (heat pumps) as an affordable option, more must be done to educate and financially support this group.

As part of the Home Upgrade Grant (HUG)[22], 4,300 low-income households in England will receive energy efficiency upgrades to cut bills, but little is available for the able to pay market. More could be done by the government to provide interest-free loans for technology in addition to grants available. Even with a £5,000 grant as part of the Heating and Building Strategy, consumers will still have to foot a hefty bill for installation and upgrades to their homes.

- *Increase buy-in from consumers to spur innovation*
- *Prioritise the middle 'able to pay' market and improve education*
- *Offer interest free loans for consumers as well as grants.*

Technical expertise

The government is adding more pressure on local authorities without providing them with technical expertise to deliver green energy projects. While there has been significant investment in BEIS Local Energy Hubs, our panel of experts agreed that these did not go far enough, as competition for support from regional and national services was high between local authorities, which are already under-resourced.

Local authorities do not have the resource to research novel practices and be innovation leaders. With this in mind, funding for schemes needs to be streamlined and have a revenue element or capitalisation funding attached to capital grant to support delivery. This would help in securing external support or short term interim support internally to help with development and delivery of schemes.

The government should also be providing support, guidance and best practice for local authorities along with better funding packages to enable the delivery of community energy schemes, in particular gap funding for infrastructure upgrades and connection costs.

Procurement support i.e. access to suitable frameworks, involving the relevant service providers, would also be helpful in streamlining the process, minimising impact on internal resources by reducing the amount of work required to develop technical documents without in-house expertise.

Knowledge sharing with the various stakeholders such as developers and planners who are delivering reduced or zero carbon projects is critical for their success. Both successes and failures should be shared – without blame – so that all can benefit from the learnings (good and bad) of others.

As well as lacking technical expertise and access to resource at central and local government level, there are also concerns about the delivery of projects on the ground. In order to meet the government's target of 600,000 heat pump installations every year by 2028[30], greater investment is required to recruit new installers and retrain existing heating installers with the skills they need to fit heat pumps.

Research[31] shows the current attitude of installers is that 'given the financial cost of retraining, it would not be prudent – or for some, even viable – to invest in reskilling when the prospect of heat pump work is currently low', so there should be subsidised training available to new and existing workforces.

A centralised space of consumer-friendly hubs, drawing together trusted information from local authorities, developers, service providers and funders, would also make a huge difference to those on the ground trying to garner interest in community energy projects.

- *Greater investment in the BEIS Local Energy Hubs as an interim support for local authorities*
- *Grants should cover resource, training and staffing as well as capital*
- *Provide more training for heating engineers*
- *Create a centralised service with information and educational materials that can be distributed across organisations generally and with consumers in communities.*

Create value in green energy

> Value is defined as: 'the regard that something is held to deserve; the importance, worth, or usefulness of something'.

While there is significant moral and environmental value in green energy, current building regulations fail to take into account the wider benefit of green schemes within the community and this is putting both consumers and developers off embarking on community energy projects.

In order to change this, we would suggest the following:

- **Improve SAP methodology**

A Standard Assessment Procedure (SAP) calculation is required by Building Regulations in England and Wales and is the official government-approved system for assessing the energy rating for a new home. A SAP calculation is required for all new homes and some conversions and extensions. It determines a SAP rating based on the construction of the home, its heating system, internal lighting and any renewable technologies installed, resulting in a figure between 1 and 100.

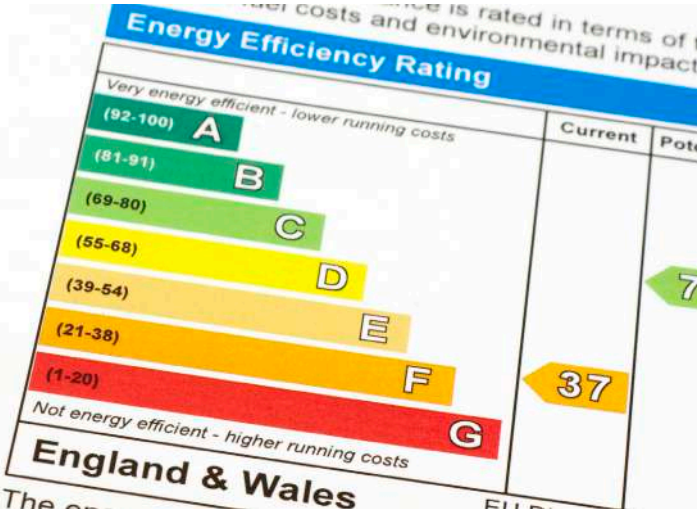
The higher the SAP rating, the lower the fuel costs and the lower the associated emissions of carbon dioxide. Housebuilders need to get a "pass" on their SAP calculations – without it, building control will not sign off on the development and the property will not be able to be marketed or sold. In addition, the SAP rating gives the energy performance of the property and informs the EPC for the property, which all buyers and tenants see.

Currently, the SAP calculation methodology does not encourage developers to deploy effective community energy schemes, as the properties do not receive the EPC rating benefit. In addition, the self-supply of the resulting energy is unregulated and does not provide a clear path for exploitation to developers.

A positive step would be to consider a consolidated grid connection for all the homes in a holistic development, rather than individual properties or units. This would also estimate whether the final development (once properties have been delivered, sold, and occupied) will be net-zero positive or negative, by calculating its grid dependency versus its onsite renewable generation.

Plus, our research showed that selling excess energy back to the grid was an incentive to retrofitting carbon-reducing technologies for 32% of homeowner* respondents.

Therefore, removing this barrier would facilitate the development of many more green homes.



- **Make EPC rating an influencing factor in the price of homes**

The perceived credibility of EPC ratings is mixed among the sector, but there is agreement that energy efficiency should factor higher in the valuation of homes. An EPC rating (from A/higher rating i.e. more energy efficient to G/least energy efficient) is a review of a property's energy efficiency – and each property needs to have a valid EPC before it is sold.

If a better EPC rating had a greater impact on the price of a home, or stamp-duty paid, more sellers would invest in a 'fabric-first' approach to include smart, energy efficient technology and buyers, in turn, would be more willing to pay a premium for such homes, knowing they would see the return in both energy bills and in its sale down the line.

The new energy security strategy[24] proposes that government will look to facilitate low-cost finance from consumer mortgage providers and double the innovation funding for green finance products, but detail is yet to be provided.

> Fabric-first: maximising the performance of the components and materials that make up the building fabric itself, such as better insulation, solar gain, natural ventilation etc.

We found that 35% of homeowners* would be incentivised to retrofit their home with carbon-reducing technology if it added value to their property.

The government should be incentivising the most economic models available. Solar PV panels, for example, can be installed as part of a community scheme by developers that attracts great economies of scale.

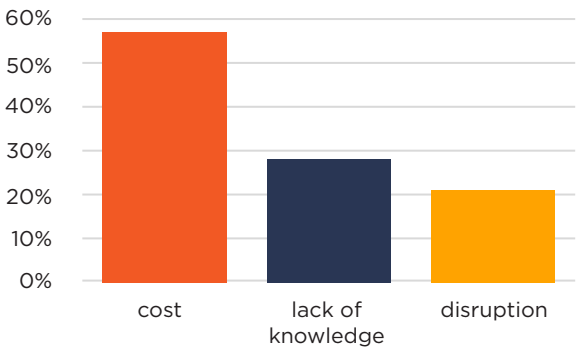
- **Greater incentives on retrofit technologies**

Our research shows that the top three reasons holding homeowners* back from retrofitting their homes are: cost (57%), lack of knowledge (28%) and disruption (21%).

In the spring mini budget it was announced that energy-saving technologies such as solar panels, heat pumps and insulation will be zero-rated for VAT for the next five years.

The Electrification of Heat Demonstration Project[32] has demonstrated that – with a relatively small sample - all housing types are suitable for heat pumps. However, our research shows that only 12% of consumers would consider a heat pump for their property. That being said, VAT exemption on products would incentivise 31% of homeowner* respondents to retrofit carbon-reducing technology, so this latest update from the government is a step in the right direction.

Figure 7. What is holding you back from retrofitting your home?



But there is criticism that cutting VAT doesn't go far enough, particularly given the rising costs of living and additional modifications needed to accommodate low carbon technology like heat pumps, so more could be done in way of grants and interest-free loans.

- **Subsidise renewables and improve education about grants**

There are currently very little subsidies paid to the renewable sector and therefore consumers are penalised with renewable contributions that sit on their domestic bills. This seems counter-intuitive to reaching a net zero goal, particularly when compared to other sectors like agriculture, aviation and fossil fuels.

Almost **2 in 5 (39%)** homeowners* stated that a government grant covering part of the cost would be an incentive for retrofitting their homes.

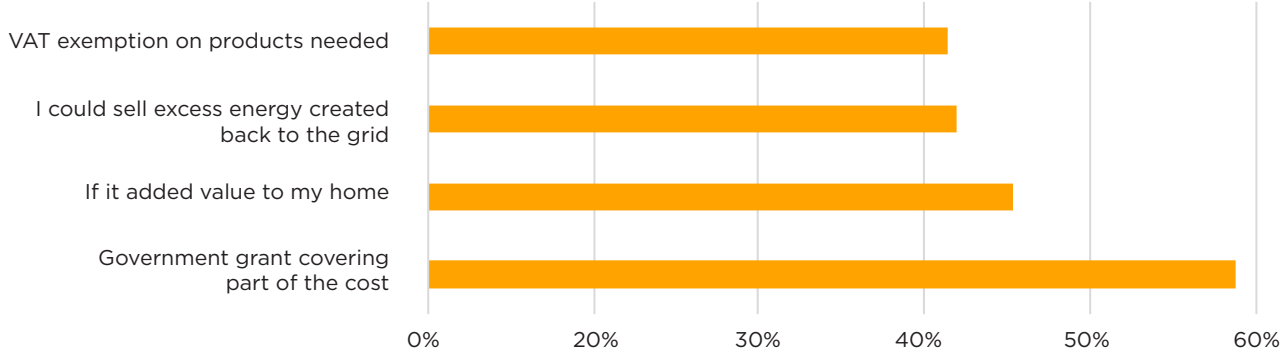
Interestingly, our consumer research showed that **60%** of all people were not aware of the Heat and Building Strategy **£5,000** heat pump installation grant. Of those people not aware, more than a third (34%) said the grant money would make them more likely to purchase a heat pump, indicating an urgent need for improved education.

However, it's widely considered[33] that this grant does not go far enough, as those not in low income brackets will have to fund the gap. With heat pump installation typically costing between **£7,000** and **£13,000**, depending on the size of the property, as well as causing significant disruption and additional costs to upgrade the overall EPC rating, there needs to be a commercial incentive for homeowners to adopt a change – as well as it being the right thing to do.

Another criticism of this scheme is that the overall **£450 million** grant scheme will only support **90,000 homes** out of the **UK's 29 million** properties that need upgrading.

- *Take a holistic view of green elections by removing cost-based model*
- *Make energy efficiency a factor in the value of properties*
- *Improve consumer incentives*
- *Subsidise the renewables sector*
- *Increase consumer awareness of grants available.*

Figure 8. What would incentivise you to retrofit your home?



Rules, regulation and risk

Some of the existing regulations are no longer fit for purpose; for example, some retrofitting 'behind the meter' projects require access to cables underground. Common sense would say to use the existing wire framework. However, current practice is that these cannot be transferred, despite the fact that existing cable and ducting has been paid for by public regulated money. As a result, new wires must be put in – causing unnecessary disruption, duplication, cost and carbon creation. To avoid this, new regulations should be imposed on distribution network operators (DNOs) to be more flexible and share the existing cable where possible, which would allow community energy projects to make use of the existing infrastructure.

- **Ensure policy keeps up with fast-changing advances in technology**

Unfortunately, the theoretical project model does not always go to plan and issues come up as developers deliver these projects. For example, a model may plan for a heat pump, but the reality is that this technology does not always work for the project, or is counterintuitive; for example the heat pump installation may require a significant transformer to power it, which makes the project unviable.

Government policy is firmly backing heat pumps as the silver bullet solution to decarbonisation of homes, but it's important to consider alternatives too, especially given manufacturing and installing new heat pumps comes with its own carbon footprint.

This is why it is important for policy to be outcomes-based as opposed to prescribing certain types of technology as the solution for all circumstances – especially given the time lags involved in their introduction of regulations to put certain policies in place – otherwise there is a risk that by the time the policy is in place, new technological advances have occurred and so the technology the policy was designed to bring becomes outdated or even obsolete.

Put simply; policy should be outcome-first, instead of tech-first. See Figure 9.

Figure 9. Methodology for choosing the right technology

1. Set objective	What are we trying to achieve with this project?
2. Fabric first	What fabric-first measures can be made to the property?
3. Heat supply	Assess which form of technology would be best
4. Longevity test	Will this chosen technology stand the test of time and still be viable in 5, 10 and 20 years' time?

- **Class exemptions for electricity licences**

Currently, two of the most prominent strategies for reducing carbon emissions are swapping petrol cars for electric vehicles and swapping gas boilers for heat pumps. Just these two initiatives will increase pressure on the electricity distribution grids and flexibility, smart technologies and transformer updates[34] will be required to ensure demand peaks and troughs are flattened to avoid overloads.

One of the best ways of providing flexibility is through numerous small generators rather than large industrial scale generators – thus creating a big opportunity for community energy projects to support this flexibility.

However, the electricity licensing regime needs to change in order to facilitate the innovation needed to achieve this.

The electricity licensing regime was set up years before heat pumps and electric vehicles. The Class Exemptions that allow onsite energy generation to be supplied to a site avoiding the complexities and costs of a supplier licence should be raised in order to facilitate the development of community energy projects, which utilise heat pumps and electric vehicles at scale – making it easy to sell and trade energy within a set location.

Currently only small suppliers, i.e. persons who only supply self-generated electricity up to 5MW (of which not more than 2.5 MW is supplied to domestic customers), are exempt from having to obtain an electricity supply licence. Additionally, a person who only supplies self-generated electricity or self-generated electricity with electricity supplied to them by a licensed supplier to certain categories of consumers, are also exempt.

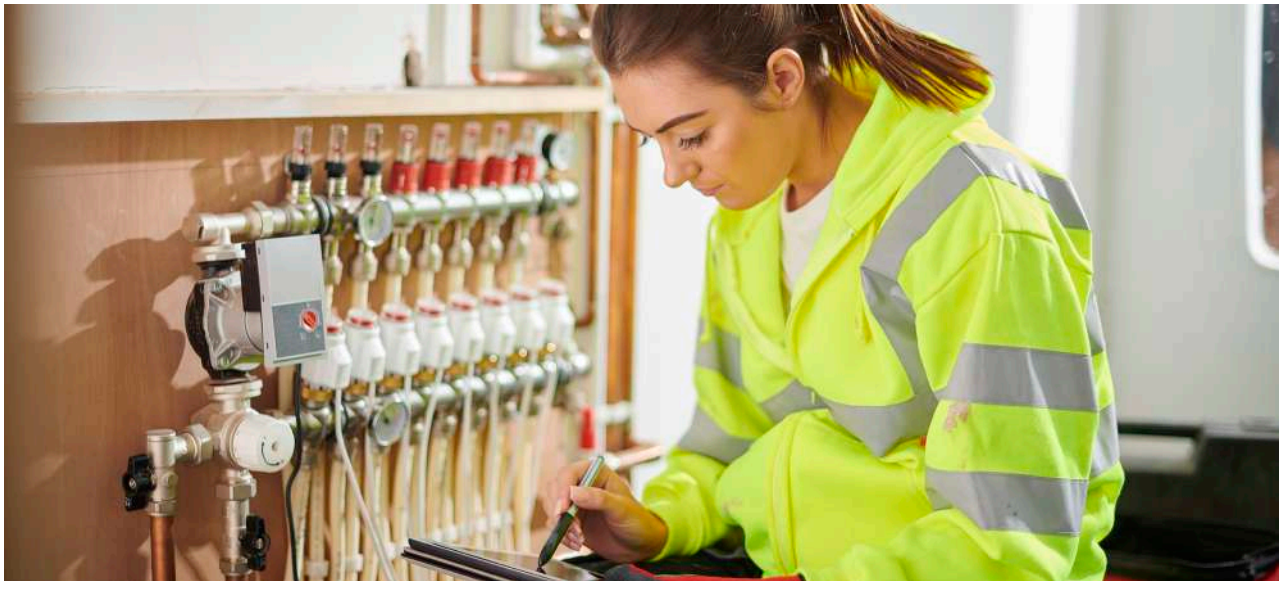
Allowing community energy developers to supply power directly to customers and also to buy excess power that is generated locally would reduce network losses and avoid costly grid reinforcement costs.

The BEIS is currently analysing feedback[35] following a call for evidence on electricity licence exemptions.

- **Establish a carbon review panel**

Greenwashing is a significant issue across multiple sectors – but in the housing sector the impact of greenwashing is proving costly not just for the environment but those responsible for the schemes. There are examples of housing schemes falling short on the targets they set out and having to retrofit in response. It is our recommendation that – similar to a 'design review panel' - a 'carbon review panel' is set up to test the claims of a scheme's designers before it is completed.

> Greenwashing: is the process of conveying a false impression or providing misleading information about how a company's products are more environmentally sound.



- **Facilitating planning**

The relationship between the planning and building regulations process has never been an easy one for net zero ambitions. Solar applications are currently provided for by Part J[36] and energy systems by Part L[37] of the building regulations. These set out the government position on schemes and are often behind the ambitions of climate commentators who encourage local planning authorities to do more through development plan policy.

Despite the energy security strategy[24] making promises to review practical planning barriers by end of 2022 in terms of solar panels and double glazing, the same report also states that there will not be a focus on wholesale changes to current planning regulations for onshore wind but instead the focus will be on local community partnerships.

With the planning system struggling to grapple with the competing aims of a government target of 300,000[37] homes a year and environmental protection focused on green belt, flood risk and biodiversity, it is no surprise that net zero remains a new area for many planners and knowledge of these schemes is limited. The result is a need for careful navigation of the system and a recognition that this process can be slow.

- **Risk and finance**

It's important that the risks of delivering community energy projects are properly identified.

Sometimes, when local authorities are looking to engage in energy projects, such as heat distribution networks, they are deemed low risk due to growing evidence of it working well across Europe. However, what isn't taken into consideration is the historic nature of the UK energy sector and whether consumers will buy into the schemes to make them commercially viable. So, while the technology is sound and low risk, there is a significant commercial risk to the project.

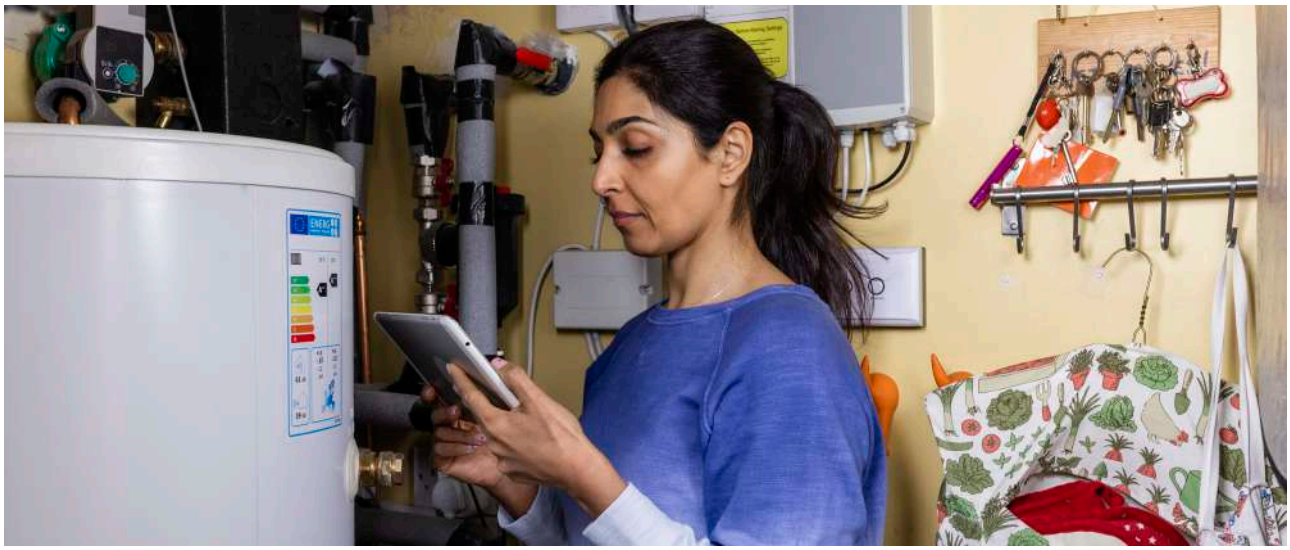
Issues arise when low cost, low risk finance is sought and a project fails – tarnishing the reputation and credit of that particular local authority or scheme type - or when projects are taken to financers who deem the project too high risk and are not awarded capital.

Misunderstanding of the risk being taken causes a real blocker, so it's important that the public and private sectors work together to agree appropriate risk level financing. Given the scale of the issue and dire need to address energy production, the public sector should be more willing to engage with the private sector to deliver projects.

If we start with the right level of risk attribution, we can then refinance with lower cost finance once the development is proven.

- *Enable the wider use of existing infrastructure and cables*
- *Make retrofitting easier*
- *Keep policies flexible and outcomes-based*
- *Simplify planning frameworks and heat metering*
- *Prevent greenwashing with a carbon review panel*
- *Apply appropriate levels of risk to finance.*

*| Research filtered by homeowners only, provided 1596 respondents



5. In summary

Change the project outlook

- *Take an outcomes approach to projects, recognising each one is different*
- *Fire a need for knowledge and innovation in the supply chain by taking a top-down outcomes approach to projects*
- *Stimulate demand with consumers to spur innovation*

Education

- *Ensure sustainability is part of every department strategy and these results are tested*
- *Prioritise the middle 'able to pay' market and improve education of available financial grants and incentives*
- *Create a centralised service with information and educational materials that can be distributed across organisations generally and with consumers in communities*
- *Provide centralised training and resources*

Support

- *Greater investment in the BEIS Local Energy Hubs as an interim support for local authorities*
- *Grants should cover resource, training and staffing, as well as capital*

Regulation

- *Make retrofitting easier with use of existing infrastructure and cables*
- *Keep policies flexible and outcomes-based*
- *Simplify planning frameworks and heat metering*
- *Prevent greenwashing with a carbon review panel*
- *Apply appropriate levels of risk to finance*

Incentives

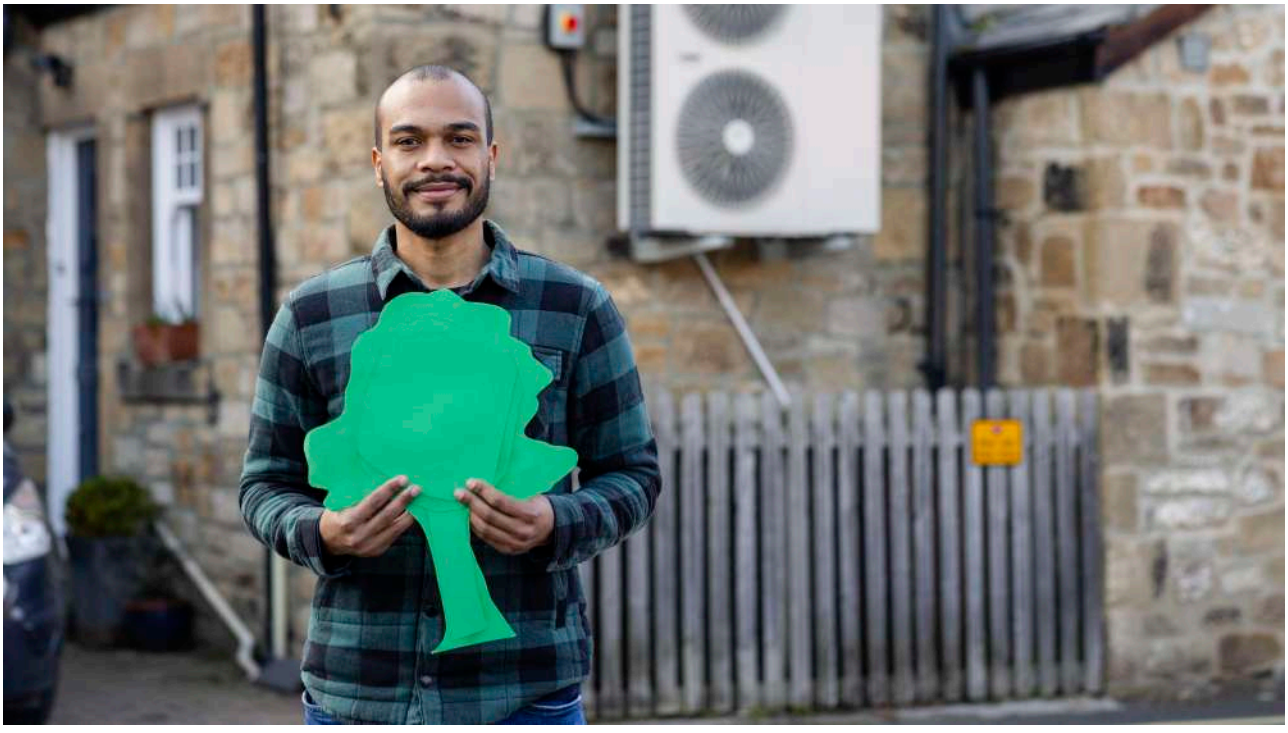
- *Take a holistic view of green electrons by considering excess energy sold back to the grid*
- *Make energy efficiency a factor in the value of properties*
- *Subsidise renewable projects that have a benefit to the relevant community.*

6. Case studies

Below we share just a few example community energy projects that are working well:

Trent Basin - Nottinghamshire	**500 new-build homes** Renewable energy, generated by solar panels located throughout the Trent Basin neighbourhood, is stored in Europe's largest community energy battery (supplied by Tesla) and then used by the National Grid. Trent Basin Energy Services Company (ESCO) Ltd - the company set up to run the project – generates income by selling energy to the National Grid. The ESCO is co-owned by Trent Basin residents, who are invited to get involved with project decision-making and entitled to an agreed share of any surplus income.
Congleton Hydro Project – Cheshire	**60 homes** Congleton Hydro is one of the first community-based generation schemes within Cheshire East. The project will produce enough clean, green energy to power the equivalent of 60 homes. The scheme will utilise the waterpower from the River Dane by installing a 65kW turbine. This installation will include a 2.5m diameter, 8m long Archimedes screw, which will drive the 75kW electrical generator. Once generated, the power will be transported through a 1000m cable to the Siemens factory.
Repowering London - Lambeth	**Two schools** Lambeth Community Solar (LCS) is a borough-wide initiative to install community-owned solar panels on schools and community buildings across Lambeth. In 2019, LCS was created after raising £137,000 through a community share offer to install solar panels on the Elmgreen and Norwood schools. 83 kWp of solar panels were installed on the Norwood school in October 2019 and 62 kWp of solar panels on the Elmgreen school in February 2020. Further funding was received from the Mayor of London to complete solar feasibility studies on additional schools in the Lambeth area. Michael Tippett School is currently undergoing a feasibility study.
District Heat Network - Leeds City Council	**1,983 homes** The initial phase will provide heat to 1,983 council homes as well as public sector and commercial customers. New internal heating systems and smart metering solutions will be provided to give customers greater control over their energy consumption, helping to tackle fuel poverty and further reducing the bills of vulnerable residents.

Orchard Community Energy – North Kent & Medway	**Commercial freezers** Orchard Community Energy was first set up with a 5 MW solar array outside of Sittingbourne, Kent – and it began generating energy in 2016. The Orchard Farm site is 100% community-owned and was part-funded by a community share offer. The society entered a partnership with COOK – a socially responsible frozen foods company – to install community solar panels on the roof of its new site at Sittingbourne. The food company buys the energy to power its freezers, which, in turn, covers the cost of funding and running the solar array. Orchard Community Energy is currently undertaking a share offer to refinance existing short-term bonds at Orchard Farm and fund new projects, and has raised nearly £1million to date from local and national investors. Orchard Community Energy pays interest to investors and uses profits to support local causes and charities.
Mobilising Local Energy Investment (MLEI) – Cambridge County Council	**53 schools** The MLEI provides loans to pay for energy-saving measures upfront, helping schools plan for the future, operate more efficiently and reduce emissions. 53 schools have reduced their heating costs while upgrading their often aged heating systems. **Seven council buildings** Thorough an extensive retrofit programme on seven council buildings, energy savings of £52,173 pa have been made.



7. Checklist for community energy projects

No.	Step	Considerations	New build	Retrofit	Useful links
1.	Establish strategy priorities (in line with corporate/ public sector body's sustainable strategy)	• Energy efficient buildings • Save money on energy bills • Reduce carbon footprint • Earn money from renewable generation • Meet prescribed community goals • Encourage behavioural change	✓	✓ Consider appoint-ing energy consultants to assess viability and costs	Energy Saving Trust Tools and Calculators Standard Assessment Procedure Community and local energy: Challenges and opportunities Institute for Public Policy Research. 2016
2.	Confirm ownership of project	• Local authority • Developer • ESCO	✓	✓	Centre for Sustainable Energy Community Energy England Community Energy Resource Hub Ripple Energy Carbon Co-op Registered Energy Providers
3.	Legal structures used	• A co-operative society • Community interest company (CIC) • Charitable incorporated organisation (CIO)	✓	✓	Legal Structures for Community Energy Projects Local Electricity Bil

No.	Step	Considerations	New build	Retrofit	Useful links
4.	Identify the best low carbon system to meet project priorities	• Changes in government policy • Fabric first • Technology • Onshore wind • Heat pumps • Solar PV • District heating scheme • Influencing factors: location, planned use, neighbouring communities, profit targets	✓ Consider appoint-ing energy consultants to assess viability and costs	✓	RPEC Energy UK AEEC
5.	Identify sources of funding	• Is the project eligible for government funding? • Other financial incentives • Produce a financial model • Some investors requesting ESG policies	✓	✓	Heat Networks Investment Project Green Heat Network Fund BHIVE Public Sector Decarbonisation Scheme REGO Woodland Carbon Code Smart Export Guarantee Domestic Renewable Heat Incentive Boiler Upgrade Scheme

No.	Step	Considerations	New build	Retrofit	Useful links
6.	Acquisition of land	• Negotiation of option and lease agreements with land owners to acquire necessary land rights • Consider any potential easements required	✓	~	RPEC Energy UK AEEC
7.	Environmental consents	• Environmental restrictions • Environmental impact • Assessment required • Decommissioning obligations	✓	✓	Environment Impact Assessment Regulations
8.	Planning	• Local authority restrictions • Planning law restrictions • Health and safety regulations • Planning permission	✓	✓	National Planning Policy Framework Renewable and low carbon energy Lawful Development Certificate
9.	Procurement	• Procurement regulations • Tender process	✓	✓	Public sector procurement policy
10.	Planning permission	• Landlord and Tenant Act • Electricity Licences	✓	✓	Electricity Licence Exemptions

No.	Step	Considerations	New build	Retrofit	Useful links
11.	Construction	• Appoint a competent contractor • Check required contractor standards	✓	✓	CIBSE CP1 Heat networks: Code of Practice for the UK (2020) Regulations: heat networks (metering and billing) MCS heat pump standards Heat Pump Association Heat Trust Scheme Heat Network Efficiency Scheme
12.	Contracts with service providers	• Equipment supply • Metering arrangements • Connection to local electricity grid • Concession agreements with ESCO • Operation and maintenance agreements • Asset optimisation agreements • Managed serviced agreements with electricity supplier	✓	✓	Utilities contracts regulations Public sector contracting authorities (Note: link correct at time of writing and may not include the most recent revisions)
13.	Revenue streams/ energy supply contracts	• Sale of excess energy to DNO • Sale to local consumers/ businesses • Sale to neighbouring sites via private wires	✓	✓	Introduction to power purchase agreements

No.	Step	Considerations	New build	Retrofit	Useful links
14.	Consumer protection and engagement	• Data protection policies and statements	✓	✓	ICO guidance for businesses Guide to UK GDPR A new Consumer Duty Heat Trust Scheme Heat networks: building a market framework Energy Ombudsman Ofgem

8. Contacts

LOUISE DREW

Head of building communities

louise.drew@shma.co.uk

ANDREW WHITEHEAD

Head of energy

andrew.whitehead@shma.co.uk

SUSHMA MAHARAJ

Energy partner

sushma.maharaj@shma.co.uk

MARK BARTHOLOMEW

Energy partner

mark.bartholomew@shma.co.uk

BRIAN MULLIN

Head of Marrons Planning

brian.mullin@marrons-planning.co.uk

SAT UBHI

Real estate partner

sat.ubhi@shma.co.uk

9. Acknowledgements

We would like to offer huge thanks to all of the people who attended our panel discussion, or supplied additional comment, support or references.

Alex Craggs - Architect & Head of Urban Design, Marrons Planning

Alia Al-Doori – MD, Pearl Comms

Andrew Cameron-Smith - Director, Social Net Zero at Social and Editorial Lead, Unlock Net Zero

Andrew Nolan - Development and Sustainability Director, The University of Nottingham

Charles Bradshaw-Smith - CEO, SmartKlub Ltd

Corall Tilling - Senior Energy Engineer, City of Wolverhampton Council

Dr Eldar Naghiyev - Research Fellow Buildings, Energy and Environment (BEE) Research Group Faculty of Engineering, University of Nottingham

Gail Scholes - Head of Public Sector and Housing, Zenergi

Mark Gillott - Chair in Sustainable Building Design at the Department of Architecture and Built Environment, University of Nottingham.

Mike Colechin - Founder and CEO, Cultivate Innovation Ltd

Oliver Thomas - Project Manager for Climate Change, City of Wolverhampton Council

Paula Hirst – Director, Disruptive Urbanism

Rosemary Coyne - SHAP Co-ordinator, Sustainable Housing Action Partnership West Midlands.

Sarah Daly - Associate Director, Sustainability, Turner & Townsend

Sarah Merrick - CEO and founder, Ripple Energy.

Simon Peltenburg - Chief Projects Officer, Ripple Energy

Toby Heysham – Managing Director, Pinnacle Power

10. References

1. https://www.gov.uk/government/publications/heat-and-buildings-strategy
2. https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/ukenvironmentalaccounts/2021
3. https://news.sky.com/story/energy-crisis-household-finances-face-worst-hit-from-surging-bills-since-1970-this-year-12519258
4. https://www.ofgem.gov.uk/publications/non-traditional-business-models-supporting-transformative-change-energy-market
5. https://www.gov.uk/government/statistics/transport-and-environment-statistics-autumn-2021/transport-and-environment-statistics-autumn-2021#:~:text=have%20higher%20occupancy.-,Greenhouse%20gas%20emissions%20from%20transport,2%25%20increase%20in%20vehicle%20miles
6. https://www.gov.uk/government/news/transport-secretary-encourages-uk-to-switch-to-electric-vehicles
7. https://www.shma.co.uk/our-thoughts/releasing-our-green-homes-report-what-buyers-want/
8. https://green-alliance-staging.onyx-sites.io/wp-content/uploads/2021/11/Community_Energy_2.0.pdf
9. https://www.ukgbc.org/climate-change-2/#:~:text=Newly%20constructed%20buildings%20are%20more,is%20decarbonising%20our%20existing%20stock.&text=Heating%20alone%20results%20in%2010,other%20building%20types%20put%20together.
10. https://committees.parliament.uk/work/645/decarbonising-heat-in-homes/publications/oral-evidence/
11. https://www.gov.uk/guidance/apply-for-the-green-homes-grant-scheme
12. https://publications.parliament.uk/pa/cm5802/cmselect/cmpubacc/635/report.html
13. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47978/1010-green-deal-summary-proposals.pdf
14. https://www.nao.org.uk/press-releases/green-deal-and-energy-company-obligation/
15. https://www.gov.uk/government/publications/net-zero-strategy
16. https://www.gov.uk/government/collections/public-sector-decarbonisation-scheme
17. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1051074/psds-phase-1-summary-report.pdf
18. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1051065/psds-phase-2-summary-report.pdf
19. https://www.gov.uk/government/publications/green-heat-network-fund-ghnf-transition-scheme
20. https://www.gov.uk/government/publications/green-homes-grant-local-authority-delivery-scheme-phase-2-funding-allocated-to-local-energy-hubs
21. https://www.gov.uk/government/publications/social-housing-decarbonisation-fund
22. https://www.gov.uk/government/news/households-save-200-on-bills-with-energy-efficiency-investment
23. https://www.mirror.co.uk/money/breaking-chancellor-axes-vat-solar-26537086

24. https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy

25. https://report.ipcc.ch/ar6wg2/pdf/IPCC_AR6_WGII_FinalDraft_FullReport.pdf

26. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1047003/climate-change-risk-assessment-2022.pdf

27. https://communityenergyengland.org/pages/what-is-community-energy

28. https://energysavingtrust.org.uk/advice/air-to-water-heat-pumps/

29. https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/bulletins/householddisposableincomeandinequality/financialyear2020

30. https://www.thermalearth.co.uk/blog/600000-heat-pumps-a-year

31. https://www.smf.co.uk/wp-content/uploads/2022/02/Installing-for-time-Jan-2022.pdf

32. https://es.catapult.org.uk/news/electrification-of-heat-trial-finds-heat-pumps-suitable-for-all-housing-types/

33. https://www.independent.co.uk/climate-change/news/green-revolution-homes-government-support-b1997788.html

34. https://orca.cardiff.ac.uk/146419/1/IMRJ_7308_20211230_V1.pdf

35. https://www.gov.uk/government/consultations/exemptions-from-the-requirement-for-an-electricity-licence-call-for-evidence

36. https://www.gov.uk/government/publications/combustion-appliances-and-fuel-storage-systems-approved-document-j

37. https://www.gov.uk/government/publications/conservation-of-fuel-and-power-approved-document-l

38. https://committees.parliament.uk/publications/8354/documents/85292/default/