



Green Homes

The new centre of residential energy services



The 'Green Homes' opportunity

The Climate Change Committee puts the cost of transitioning the UK's 29 million homes to net zero at £250bn¹. This represents an unprecedented opportunity for service providers involved in the energy infrastructure and home life-cycle.

Decarbonising residential homes, which account for about a fifth of the UK's greenhouse gas emissions, is one of the most challenging and important frontiers in the battle to limit climate change. In addition to helping the UK meet its net zero target, reducing our dependence on gas has also recently come into focus for another reason: rising geopolitical tensions between Russia and Europe. So, with gas prices at current highs, there is added incentive for both policymakers, market participants and homeowners to ramp up efforts to decarbonise our domestic energy use.

 Supply chain innovation is needed



Green homes will span new opportunities and ecosystems

Greening the UK housing stock will require mass replacement of traditional fossil-fuelled boilers, retrofitting double glazing, insulation, solar and heat pumps, which will give rise to new market opportunities for would-be providers of these technologies and the electricity they consume. Customer needs are evolving to reflect this and success in these new markets will require organisations to develop new capabilities and innovative strategies to translate complex supply chains into simple customer propositions. This is leading to disruption across more than just the traditional energy industry, giving rise to new business models and increasing cross-sector collaboration.

Decarbonising UK homes will lead to significant new value pools in the near future, totalling £12bn per annum by 2030. This is not simply an energy market problem for energy utilities to solve – this challenge will touch virtually every sector, with various roles to play across the green home value-chain. Companies from a range of sectors, from the energy retailers, to financial institutions, to technology companies and even car manufacturers, should be setting their strategies now to capture future opportunities. Much of this will be driven by a combination of government policy, changing consumer preferences and improved market collaboration.

 £250bn cost to bring 29 million UK homes to net zero

Time horizons to de-carbonisation

The market is evolving. We believe there will be three distinct time horizons to home decarbonisation, each with distinct value drivers:

Horizon 1 – early 2020s

- Publicly funded energy-efficiency projects for the social rental sector and low-income households is a 'here and now' opportunity that will also help reduce fuel poverty.
- The focus should be on building fabric upgrades to meet EPC 'C' in rental sector.

Horizon 2 – mid- to late-2020s

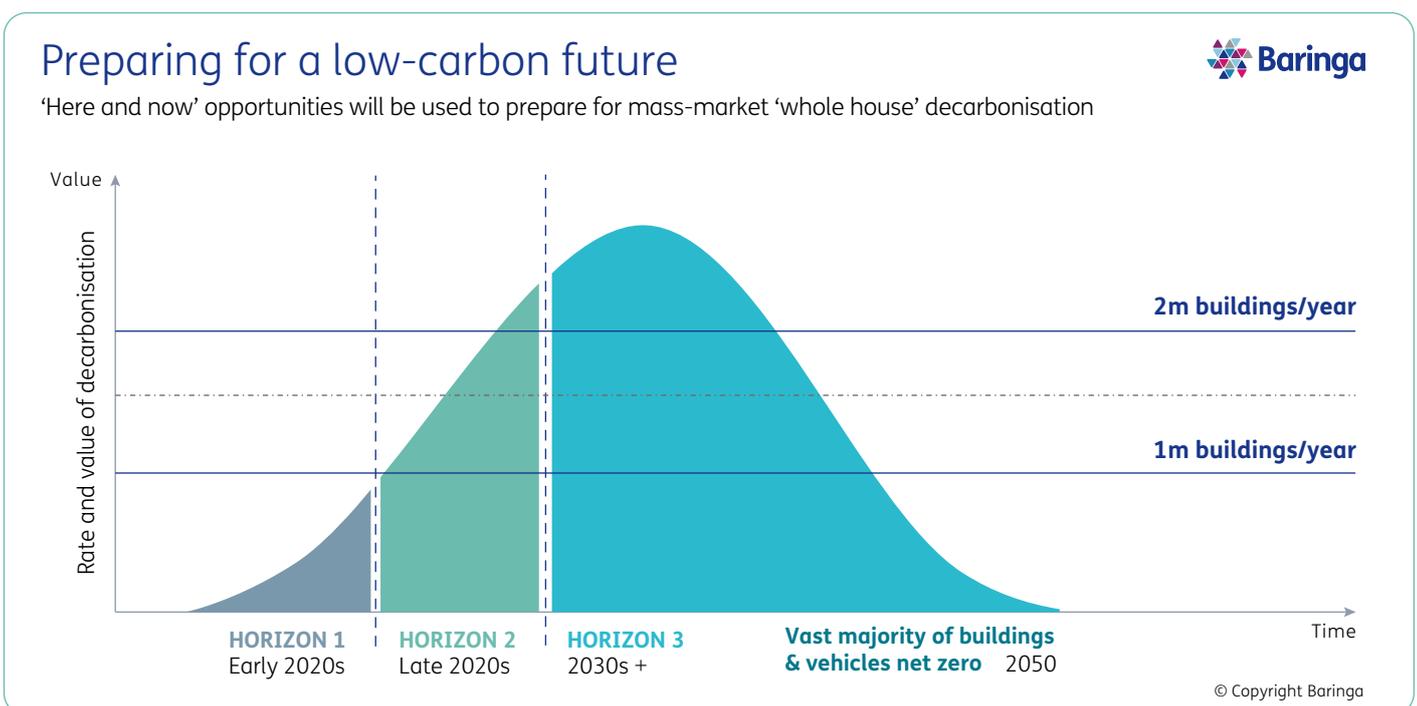
- New-build housing market, early adopters from the owner-occupied segment and off-gas grid properties, for whom, it is intended new fossil fuel heating systems will be prohibited (e.g. no more oil boilers).
- Heat pump supply chains are improved as demand increases significantly, from about 200,000 new-build properties per year that cannot install gas boilers from 2025. However, gas boilers likely to still be dominant choice overall.
- Building fabric upgrades to meet EPC standards remains key.

Horizon 3 – 2030s onwards

- Greening homes becomes mass market with greater penetration into the owner-occupied housing stock, as energy efficiency regulations and increasing public awareness of the challenge, combined with falling costs of new technology drives ever-quicken pace of the transition to a greener future.
- Gas boiler replacement ban in place or imminent.
- Mortgage lenders will provide more green finance support and incentives to this sector as they seek to de-risk their mortgage books.

The three horizons show the pathway to transitioning to a green home future and by the end of the decade we will see significant revenue potential. The work must begin urgently today. There are near term opportunities that must be grasped, and medium to longer term strategies to prepare for.

Organisations should be looking at developing the capabilities they need to maximise their opportunity. Horizon one offers the opportunity to 'test and learn' to be ready for this growing market. There is money to be made now, but more importantly, there is the chance to better understand what is needed to successfully compete in the future when the size of the prize is bigger. Building a successful supply chain, creating tailored customer propositions that the customer values, testing partnership opportunities and refining operating models will all be needed.



Industry discussions on supply chains, finance and the customer

Baringa recently hosted a series of 'Green Homes' roundtables to discuss approaches to decarbonising domestic energy consumption in owner-occupied homes and how to accelerate the transition through the three market horizons. Participants were leading players from a wide range of supply chain actors including energy retailers, mortgage lenders, market investors, installer bodies and hardware manufacturers.

There were three events with the following themes: Supply Chain, Financing the Transition and the Customer Proposition. This paper presents some of the key ideas discussed during the roundtables, before overlaying Baringa analysis of future home decarbonisation value pools and the implications of this on various sectors (primarily by way of call to action!).



>£5,000 – average cost per home to reach EPC 'C'

The Green Homes challenge

It's no secret that decarbonising 29 million poorly insulated British homes is a daunting challenge, and one that will take a mammoth effort from both the public and private sector. While the government's 2020 Energy White Paper states a target of achieving an Energy Performance Certificate (EPC) of at least C by 2035, at present there is no regulation in place which compels homeowners to improve the energy efficiency of their homes. (While there are currently some support schemes available, these are primarily targeted at the social rental and low-income household market.)

This represents a high capital cost to homeowners. Various estimates suggest a minimum average cost of £5,000 per household to upgrade all homes to EPC C by 2035, with currently about 60% of homes not meeting that requirement².

However, given a lack of regulatory requirement, it's no surprise that our roundtable discussions highlighted more market challenges than solutions. However, outlining the current state of the market is a useful exercise in setting the context and backdrop from which solutions can arise.



The current challenges can be broadly grouped into supply chain, finance and customer proposition.



Supply chain

- **Lack of clear policy incentives to mobilise supply chain.** Added uncertainty resulting from bold but unsuccessful early schemes such as the Green Deal and Green Homes Grant for homeowners.
- **Skills gap.** The heat pump industry is thought to support 2,000 installation jobs, according to the BEIS. However, OVO Energy estimates that 200,000 installers would be required to achieve net zero³.
- **Insufficient clarity or certainty in technology pathways.** Installation firms therefore hesitant to retrain staff to install specific low-carbon technologies such as heat pumps.
- **Lack of customer demand.** For reasons including lack of policy incentives, high capital costs, a lack of attractive financing solutions or low awareness, low demand is an added deterrent to investment.
- **Low-carbon technologies can be more complex to install and operate.** The length of the instruction manual for a heat pump is much longer than that of a gas boiler, making it less customer friendly.
- **Technology costs and supply chain risks** are currently prohibitive to both individual consumers and lenders to invest in low-carbon retrofits.



Finance

Greening the UK's housing stock is a critical activity for financial services providers to enable them to meet their net-zero commitments. UK mortgage providers have on average around 60% of their housing stock which is EPC D and below.

- **Technology finance risk.** Lenders voiced concerns over financing new or less common low-carbon technologies such as heat pumps due to their complexity, high cost to consumers, and potential obsolescence risk due to changing regulations and potential technology improvements.

- **Liability risk.** The disaggregated nature of the installer market creates lots of risks to lenders, due to the possibility of poorly conducted works. Having a bank provide a £25,000 loan for a home retrofit that is poorly carried out creates a large liability risk – who is responsible for the resulting losses (not to mention the damage to the brand)? It is likely this liability falls with the lender under the current Consumer Credit Act (S75). Indeed, Barclays faced a £38.5m bill to compensate households over solar panel loan mis-selling and other failings by businesses that brokered its finance deals, brought under the S75 regulation.
- **Product development.** The jury is out on the optimal debt product to help facilitate mass-market residential energy efficiency retrofits – many questions still need to be answered to assess consumer preferences and lender risk appetite.



Customer proposition

- **Consumer awareness.** Consumers can be sceptical of the need for change or in many cases unaware that they need to act, not always associating their 'leaky' home with climate change. The market needs to better help consumers on their journey. Gas boilers are well understood and considered easy to use, a challenge that must be overcome if this market is going to be successful.
- **Simplicity.** The market lacks a truly compelling proposition which removes the barriers faced by homeowners, provides clear information on how to reduce a home's emissions and minimises hidden transaction costs associated with a multi-step customer journey. Customers need a simple, engaging service that delivers value.
- **Demand stimulation.** The cost of greening homes is still currently too high to be an attractive capital investment for homeowners, and consumer demand will need to grow to stimulate the supply chain and solutions providers to reduce costs through efficiencies. With electricity and gas prices currently at record highs, investing in energy efficiency measures suddenly looks far more attractive both as a way of reducing energy bills and exposure to volatile energy markets.

³ <https://committees.parliament.uk/writtenevidence/18529/html>

The opportunity will be significant for those that can navigate the challenges

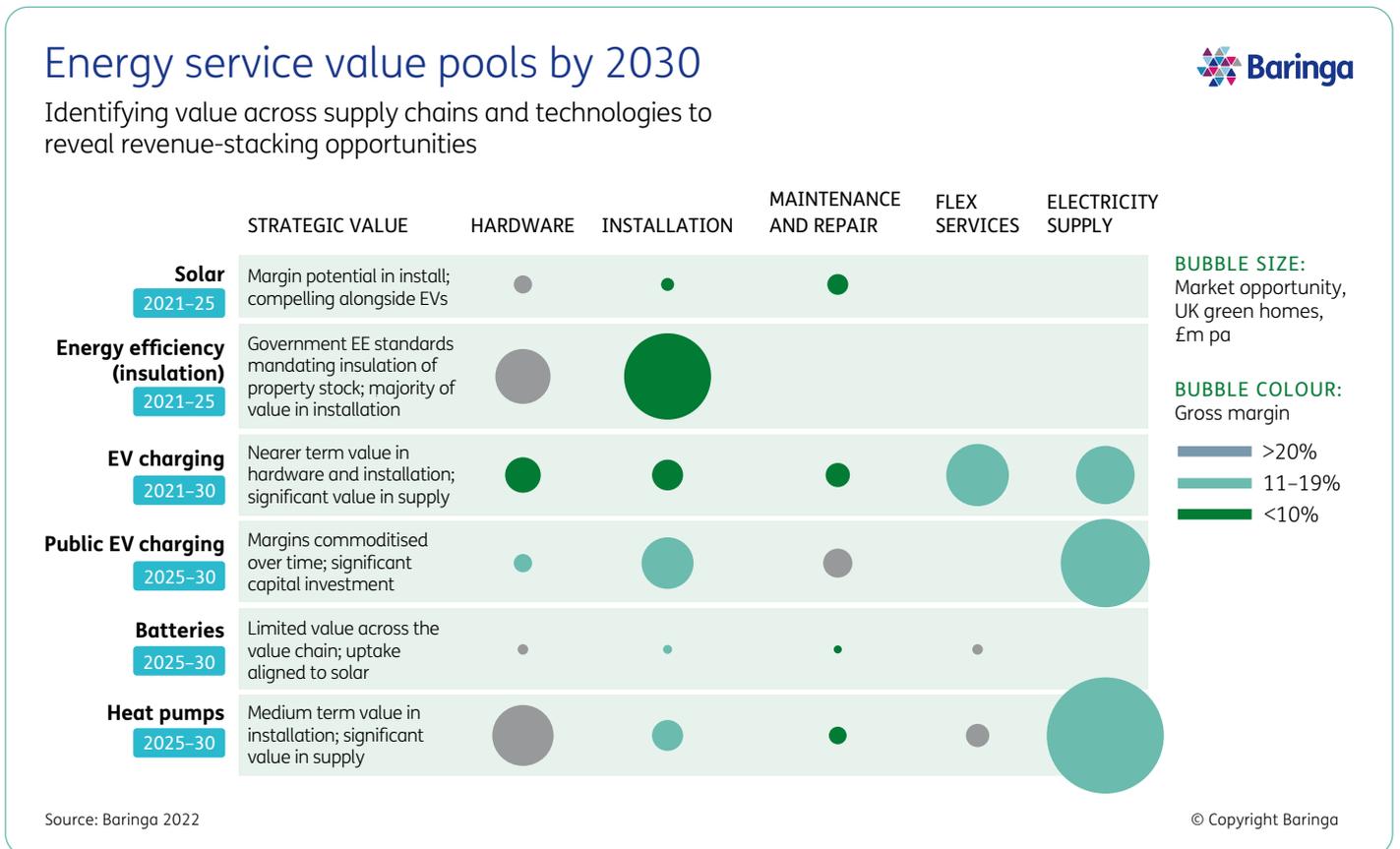
While there are various challenges in the market, fast-forwarding to 2030 (the start of Horizon 3: mass-market) we see a very different value picture to today – our analysis estimates total additional value from home energy services and additional electricity supply of £12bn per year. 2030 will be a tipping point for home decarbonisation as the deadline for all private and social rental homes to reach minimum EPC C will have passed, and the government’s attention will likely have switched to supporting the owner-occupied sector to meet the same target by 2035 (if it hasn’t already been moved forward to 2030).

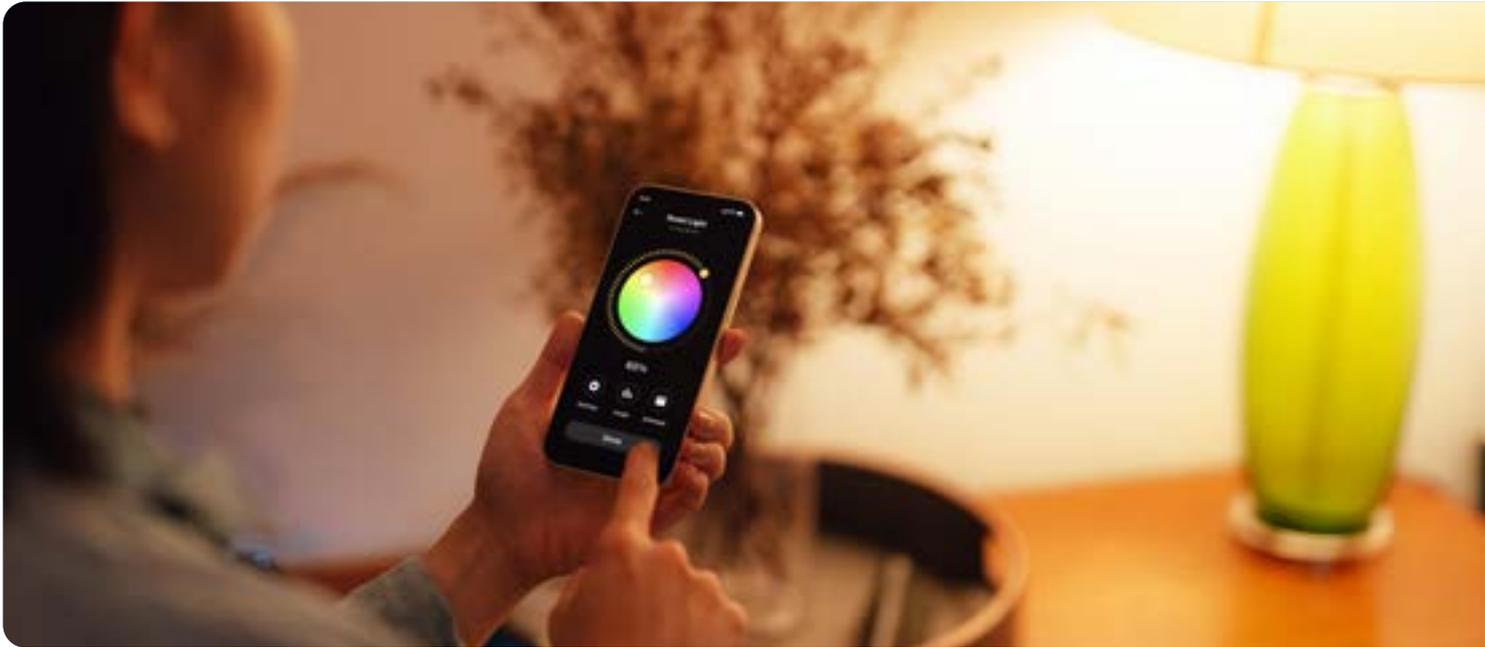
Policy clarity will also increase over the next decade, with the government stating its intent to announce a position in 2026 on the role hydrogen will play in domestic heating, giving the industry more confidence on where to invest and making it more likely that sales of new gas boilers will be banned from 2035.

This value will be split across five types of services required by customers: provision of hardware, installation, maintenance, as well as the additional supply and time-of-use optimisation services to new electric heat pumps. The heat pump market will be significantly larger than today, boosted by subsidy support into the social housing sector, the banning of gas boilers for the roughly 200,000 homes build each year, and expected ramping up of further policy support for the owner-occupied segment.

The greatest pool of recurring value will be the additional electricity supply that will be required to run the heat pumps (as this value accrues, as opposed to installation values which are one-off investments).

While this total 2030 market size is significant, it is still driven primarily by growth in the rental and new-build sectors as they are the current focus of government policy. Once attention switches and more support is offered to the owner-occupied market, value will grow further. Companies that can provide homeowners with the simplest and most hassle-free solution will be able to capture most value.





Will EV adoption drive us towards a greener lifestyle?

Many view electric cars as the 'here and now' opportunity as it's clear that they're here to stay and adoption will only increase, driven by a clear regulatory framework and near cost-parity of EVs. An EV is also likely the first serious step homeowners are taking on their journey to net zero. Once they have an electric vehicle, installing solar, and eventually a heat pump will seem like natural progression. This is causing both car manufacturers and oil and gas companies, among others, to explore new business models and think about electricity supply, data and analytics in new ways – if they supply the EV charger, why not the solar and battery or even the energy supply?

Businesses should consider the following critical questions:

1. How do you **monetise the immediate opportunity** to create propositions that are engaging to the customer and drive the decarbonisation agenda?
2. In addition, how do you **prepare for the medium and long term horizons**?
3. **Where are your competitive advantages** across the different horizons and markets?
4. **How do you create a compelling route to market** that will enable you to successfully deliver the propositions?

Creating customer demand by driving change in the eco-system – how to make it easier for homeowners to act?

A commonly cited barrier to market growth is that consumers lack information and guidance on how to reduce the carbon footprint of their homes. Consumer attitudes towards energy efficiency and green heating especially is a major barrier. The market needs to persuade consumers that the disruption and intrusion in their home is necessary and will ultimately be to their benefit. More attention needs to be given to where consumers are on their journey to improve their homes.

Currently the home energy efficiency market is very fragmented and local (there are very few providers with national coverage, and 90% of boiler installation firms assessed in a Baringa study were found to have less than 10 employees).



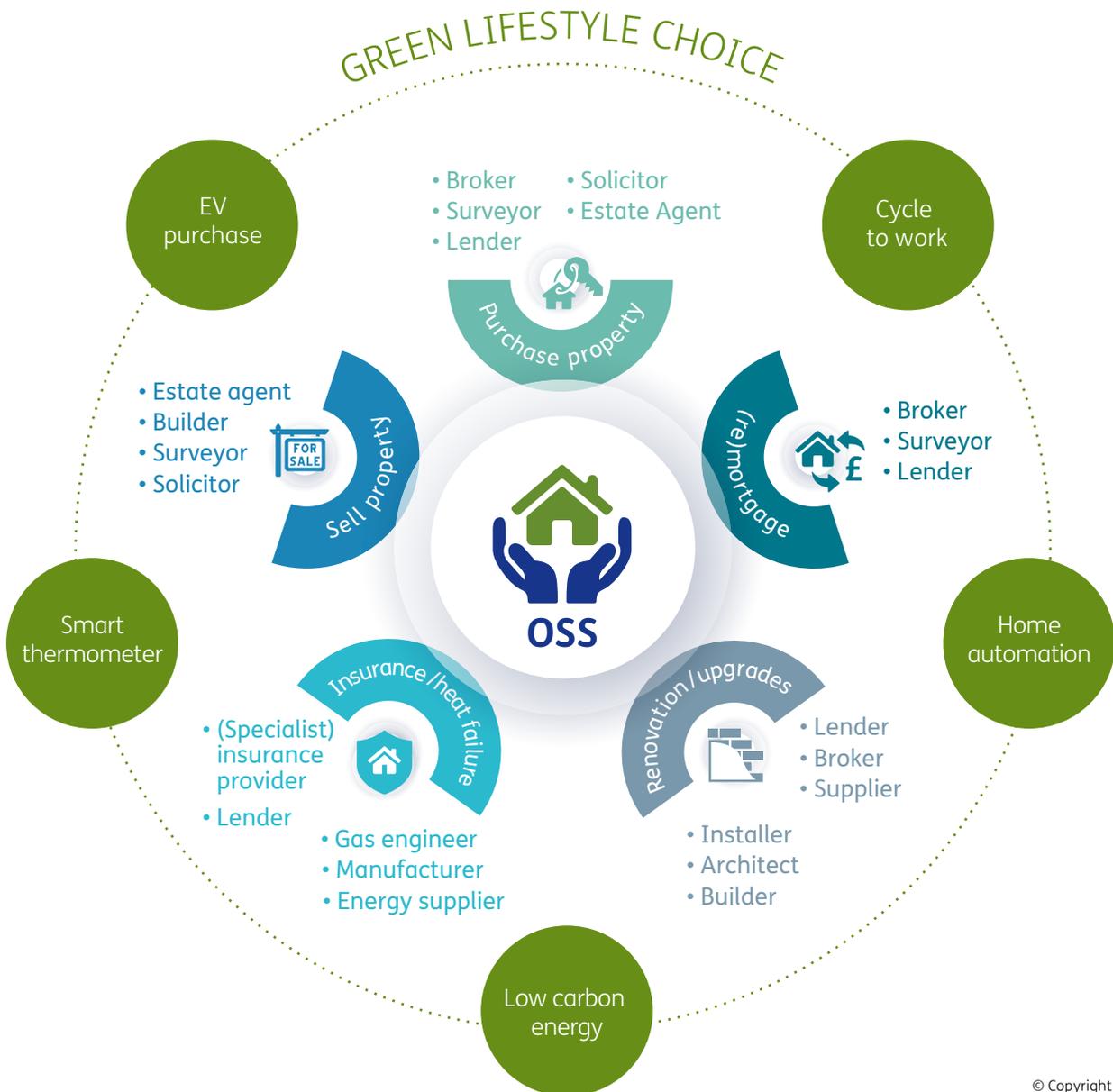
We estimate £12bn in additional value from home energy services and extra electricity, each year

Mobilising the supply chain

Transforming this industry into something large enough for the task-at-hand, within the necessary timeframes, will require participants from across the housing value-chain to co-ordinate and work collaboratively to develop new business models, partnerships and tailored customer propositions.

Traditional customer touchpoints can be used to pass on information and make energy efficiency front-and-centre. For example, at point-of-sale, more is needed to emphasise the benefit of energy-saving measures so that consumers start to value decarbonisation. There is a role to share information and provide clear advice to homeowners on the benefits of green home measures. This role doesn't simply fall to the energy supplier or

The ecosystem and life-cycle of a Green Home



mortgage provider, but needs to include the estate agent, the surveyor, even the local authority setting the council tax bill – all the parties that the consumer interacts with on the house. The market needs the customer to value a green home.

Trigger-points can be used to educate homeowners about the carbon impact of their homes and increase awareness of the benefits of low-carbon alternatives. When a customer is making a change in their house, every effort needs to be taken to associate this with an opportunity to green the property. This is vital as increasing customer demand will provide confidence to supply chains to upgrade its training and installation capacity.

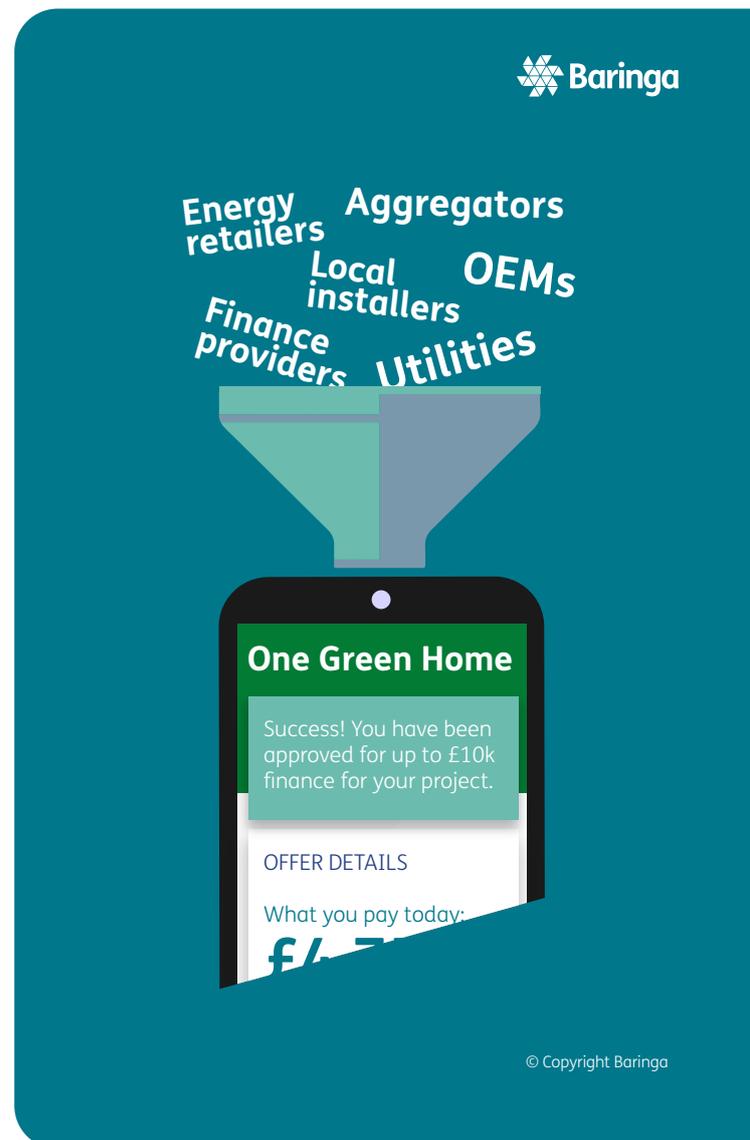
The illustration below summaries a number of the key touchpoints in the lifecycle of a home that can be used to create new propositions and relationships in the market, as well as all the different market actors that have a role to play in generating customer pull.

The One-Stop-Shop: simplicity is key!

Personalised, seamless and intuitive customer experience is a must-have. Baringa's view is that a One-Stop-Shop (OSS) platform, which provides customers with a single point of contact for home energy services products, will be the most successful. The barriers faced by consumers need to be removed.

Creating a smooth customer journey which helps customers understand what needs to be done to their homes, make informed choices, manages a smooth installation process, and even integrates a simple finance solution to alleviate the cost burden, will fill a major gap in the market. This is where previous schemes have failed, such as the UK's Green Deal (2012–2015), which was a government policy initiative that provided loans for energy efficiency upgrades.

It is widely believed (according to a National Audit Office report) to have been unsuccessful due to its narrow focus on financing solutions, without creating a simple customer journey. Homeowners were still faced with the hassle and costs associated with managing a multi-step process from finding installers and arranging surveys and finance.



A One-Stop-Shop platform would offer most or all of the following:

- Data-driven energy and carbon insights which can produce a tailored pathway to net zero for individual properties;
- Survey and guidance as to the changes required;
- Embedded financing options;
- Coordinated installation and post-installation processes;
- Equipment maintenance and aftercare service;
- Energy supply & time-of-use tariff optimisation.

Who will win the race to be the net-zero partner of choice for homeowners?

The OSS, whether it be a green mortgage provider, fintech company, green technology services provider or energy supplier, won't be the only role. Creating a compelling proposition will require strong data analytics capability to truly know the customer and their home, artificial intelligence and asset control to enable time-of-use flexibility for heat pumps and EVs, energy supply and billing, installation and maintenance of equipment, and financing.

Various organisations from multiple industries are considering their role in this future market, and how they can best capture value in supporting the country's decarbonisation.

Using capital as a platform for green home services

Financiers are also exploring the possibility of expanding their role in the value-chain for three reasons:

- Firstly, to expedite the deployment of capital into the green homes market.
- Second, to de-risk their mortgage portfolios as energy-efficiency regulations will equally impact mortgage lenders as house prices may suffer as a result of non-compliance.
- Thirdly, because the growth trajectory of this market makes it attractive to take a leading role and directly deliver installations into customer homes. While a shift away from 'business as usual' working with a partner offers the ability to enter this market and capture value right across the value chain.

Virtually every type of finance provider is under increasing pressure from shareholders to invest in ESG-backed projects, and they're exploring innovative ways to find the most efficient way to do so. Whether that means taking a stake in different parts of the value chain or developing new apps which help create a marketplace for energy efficiency by linking up supply and demand, there is a range of options to explore for those seeking to lend into this market.

Targeted use of customer data will improve sales conversion rates

A key component of a One-Stop-Shop solution will be clear, accurate and consistent information which will help homeowners make informed decisions about how to decarbonise their homes.

How energy is used within people's homes is fundamental to unlocking these options – but it's not the only source needed. When combined with other data across the whole supply chain – such as property data and socio-economic data – truly tailored propositions can be built for individual customers. This will ultimately lead to better conversion rates and customer satisfaction.



Companies should act now to position themselves for the next green industrial revolution.

For the UK to reach net zero emissions by 2050, 1.5 homes will need upgrading every minute on average, according to a recent Nesta survey (2021)⁴. Decarbonising the UK's domestic energy use and transitioning to an electric future will create new, multi-billion pounds a year value pools which require a broader set of supply chains from more industry sectors than today.

This isn't a market just for the energy suppliers, or just for the financiers. Right across the value chain there are important roles to play, and most importantly there are those organisations that can knit the different roles together to make it seamless for the customer.

As we electrify road transport, electricity supply, either from large-scale renewables on the grid or personal solar and storage systems, becomes integral to the road transport sector, therefore giving traditional automobile and oil and gas companies a stake in the power sector where they didn't have one before.

Data management is front-and-centre as we integrate our electric cars and heating into our Smart Home ecosystems. Companies which can successfully navigate this new sophistication and help customers on their net zero journey by creating simple, yet robust propositions to package up these capabilities will be successful.

To unlock the value in the transition, organisations must use available data to understand how consumers behave to tailor the Green Homes journey. The company that understands what the customer needs will be able to create a compelling proposition that can change consumer attitudes and persuade them of the need to change.

All organisations which have a role in the Green Homes supply chain should set out their stalls early. They need to rapidly define the business they want to be and begin trailing new business models to ensure they are best prepared for when the challenge of greening our homes becomes mass-market and can offer robust, properly considered and proven solutions. The market today is very fragmented. Investments will support the development of the wider supply chain, which in turn will support the reduction in costs and improvement in consumer information, helping to accelerate market growth.

What do you want to be: a leader or a follower? For those that sit idle risk missing out on this multi-billion pound opportunity. Plan early, plan well and, critically, make it simple for the customer.



Electricity supply, from large-scale renewables on the grid or personal solar and storage systems, is now integral to road transport and therefore both the automobile and oil and gas sectors.

⁴Decarbonising Homes: Consumer attitudes towards energy efficiency and green heating in the UK, June 2021. Nesta.org.uk



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