Kick-starting the decarbonisation of heat

A report from Energy UK
Spring 2018
In order for the UK to transition to a low carbon economy and enable the country to meet emission reduction targets, there is a need to coordinate the various policy strands of government into a coordinated decarbonisation effort, and to develop the groundwork for decisions to be made in the early 2020s.

Throughout 2017, Energy UK consulted members and engaged a wide range of stakeholders across industry on the options to decarbonise Great Britain's provision of heat. This paper highlights tactical decisions and actions that are required by industry, Government and Ofgem in the short term, in particular in relation to the Renewable Heat Incentive. Later this year Energy UK will publish a paper on strategic low carbon heat decisions, containing recommendations for the long-term decarbonisation of heat, and initial views in this area are summarised below.

It is vital that a “whole-system approach” is adopted to decarbonise heat, and that it is integrated into a wider strategy covering transport, energy, and industry, that will give enhanced clarity to investors, industry, and consumers alike. Delivering a stable, long-term, holistic policy and regulatory framework for heat will provide industry with the confidence necessary to develop and invest in low carbon solutions. Creating markets for low carbon heat, in addition to energy efficiency, will encourage and enable consumers to take more active control over their own emissions and their energy bills, as well as advancing the decarbonisation of another segment of the UK’s economy.

About Energy UK

Energy UK is the trade association for the GB energy industry with a membership of over 100 suppliers, generators, and stakeholders with a business interest in the production and supply of electricity and gas for domestic and business consumers. Our membership encompasses the truly diverse nature of the UK’s energy industry – from established FTSE 100 companies right through to new, growing suppliers and generators, which now make up over half of our membership.

Our members turn renewable energy sources as well as nuclear, gas and coal into electricity for over 26 million homes and every business in Britain. Over 730,000 people in every corner of the country rely on the sector for their jobs, with many of our members providing long-term employment as well as quality apprenticeships and training for those starting their careers. The energy industry invests over £11bn annually, delivers £88bn in economic activity through its supply chain and interaction with other sectors, and pays £6bn in tax to HMT.
Conduct a review of the regulatory framework for heat to identify how to maintain and improve upon existing policies.

Reintroduce zero-carbon or net-zero-carbon housing policies as part of a national energy efficiency strategy.

Ensure the inclusion of heat across government and regulatory workstreams to develop a smart flexible energy system.

Undertake a review by the end of 2018 on the future of the Renewable Heat Incentive, Heat Network Innovation Project, and other initiatives that are due to close in the early 2020s, to provide clarity on the long-term framework for funding, enabling investors and customers to understand the opportunities that lower carbon heating solutions provide.

Reintroduce zero-carbon or net-zero-carbon housing policies as part of a national energy efficiency campaign, integrating this with changes to building standards requiring low carbon heating and a regulatory framework for district heating.

Conduct a review of the regulatory framework for heat to identify how to maintain and improve upon existing policies.

Initiate and drive forward large-scale trials, incorporating a range of technologies including low carbon heating and green gas solutions, to develop available resources and an evidence base for low carbon heat in the UK.

Ensure the inclusion of heat across government and regulatory workstreams to develop a smart flexible energy system, recognising the potential value of heat resources within flexibility markets, and the impact of this revenue stream on capital costs to consumers in decarbonising heat; and,

Proceed with areas of heat which are no/low regret by laying out a plan by the end of this Parliament to deploy low carbon heat solutions in, for example, off gas grid properties, comprising between 15-20% of UK households.

Industry is ready to pick up the baton to deliver innovative solutions to the heat challenge and will take action where practicable. For industry to successfully deliver in decarbonisation efforts, government must act as a market enabler, particularly in the next 5 years pursuing technology neutral policies which, where possible, provide long-term certainties. To this end, government should:

- Undertake a review by the end of 2018 on the future of the Renewable Heat Incentive, Heat Network Innovation Project, and other initiatives that are due to close in the early 2020s, to provide clarity on the long-term framework for funding, enabling investors and customers to understand the opportunities that lower carbon heating solutions provide;

- Reintroduce zero-carbon or net-zero-carbon housing policies as part of a national energy efficiency campaign, integrating this with changes to building standards requiring low carbon heating and a regulatory framework for district heating;

- Conduct a review of the regulatory framework for heat to identify how to maintain and improve upon existing policies;

- Initiate and drive forward large-scale trials, incorporating a range of technologies including low carbon heating and green gas solutions, to develop available resources and an evidence base for low carbon heat in the UK;

- Ensure the inclusion of heat across government and regulatory workstreams to develop a smart flexible energy system, recognising the potential value of heat resources within flexibility markets, and the impact of this revenue stream on capital costs to consumers in decarbonising heat; and,

- Proceed with areas of heat which are no/low regret by laying out a plan by the end of this Parliament to deploy low carbon heat solutions in, for example, off gas grid properties, comprising between 15-20% of UK households.

Executive summary

Provision of heat currently contributes around a quarter of all UK greenhouse gas emissions and will take a concerted effort from government, regulator and industry to decarbonise. The focus of policy makers to date has been on taking action to reduce the carbon emissions in the power sector, but urgent action is needed to lay the groundwork for a regulatory and policy framework that can support the decarbonisation of heat over the next two decades. There are a number of low carbon technologies which can be utilised as sources of heat at present, but there is a considerable amount of information lacking on how these technologies can be integrated with each other at a large scale. There is also a significant gap in existing focus on ensuring that the customer experience and consumer costs of decarbonisation are addressed, including existing barriers of cost and availability of low carbon heat solutions.

The UK power sector continues to make significant contributions to emissions reduction, achieving a 19% reduction in greenhouse gas emissions from the supply of energy between 2015 and 2016. A holistic approach to decarbonisation will enable the integration of increasingly low carbon power sources into decarbonisation efforts through electrification of heat and transport. The decarbonisation of heat will have a range of impacts, and work done by UKERC and the University of Exeter has been useful in determining some of these, as well as mapping out visions for decarbonising industry. The integration of assets across a range of industries will enable an efficient transition which meets carbon reduction targets at lowest cost to consumers.

This paper highlights a number of decisions which should be made on the decarbonisation of heat, with a focus in two main areas. The paper examines a series of changes to the Renewable Heat Incentive (RHI) which can be enacted by this government to affect change and smooth the way for the transition to low carbon heat. The paper also takes a broader look at how government and industry can work collaboratively in the development and rollout of large-scale trials for decarbonised heat.

In parallel to this work, it is essential that government and the energy industry work to give clarity to industry and consumers on the direction of travel. This should be achieved by undertaking a full-scale review of the policy and regulatory framework for heat, focussing specifically on how to improve the customer experience of heat services, utilising appropriate best practice from the UK and other countries. This review should assess how to create an attractive investment climate for heat as a service business model.

The recommendations of the Heat Networks Task Force should also be integrated into the framework, as resolving the concerns raised by Citizen’s Advice and BEIS, and currently under Investigation by the CMA, is a priority for improving consumer and investor confidence. Finally, this review should ensure that best practice is encouraged and carried forward into the UK framework.

It should be noted that heat has a role to play in the developing framework for a smart flexible energy system as defined by BEIS and Ofgem. Increasing levels of electrification and the deployment of multi-source heat networks mean that a larger number of heat assets will provide value to the system by shifting their demand at times of strain. Trials across the UK, including the FREEDOM project and Smart Electric Heating Retrofits project noted in this paper, have begun to demonstrate the value of heat as a flexibility resource. The developing evidence shows that not only can heating become an asset to the UK energy system, but that by implementing business models and market structures which recognise the value of flexibility, we can reduce the capital costs to consumers of decarbonising heat.

A number of decisions concerning heat need to be made during this Parliament, as they cannot be delayed without causing further uncertainty and endangering the UK’s ability to meet its greenhouse gas emissions targets. Energy UK supports the principle laid out by the Committee on Climate Change for a framework to be implemented by 2020 in order to meet the requirements set out in the 4th Carbon Budget. Trials for integrated low carbon heat solutions, energy efficiency measures and incremental improvements to the efficiency of gas should be rolled out to develop a comprehensive evidence base and establishing supply chains for Carbon Capture, Utilisation and Storage (CCUS) and a range of technologies. These should be integrated into regional low carbon heat frameworks which play on existing strengths across the UK.

Many of the actions to be taken from this paper are the responsibility of government, but the energy industry stands ready to support in information gathering, decision-making and rollout wherever appropriate. Following the publication of this paper, Energy UK is gathering information to set out energy industry opinions on the longer-term strategic decisions for heat and will explore this in a paper on the future of decarbonised heat later in 2018.
In 2017, OVO’s Smart Heat division worked with several housing associations including Newcastle City Council, Glasgow Housing Association and others to retrofit VCharge Dynamos to existing storage heaters predominantly in tower blocks. The project aimed to improve operability, comfort and reduce the cost of space and electric water heating. The customers addressed were mainly in social housing with higher than average levels of fuel poverty.

The Dynamo product is retrofitted to the mains supply of existing storage and water heaters. It connects and sends telemetry back to OVO’s VNet platform where learning algorithms develop a model of each room in the home and use weather, energy price data and other revenue opportunities from grid balancing to calculate the optimal charging pattern for each asset. Customers can use a mobile app to set the temperature and comfort periods of each room in their home.

The project had installed over 1000 units by the end of 2017, providing over 2.5MW of controllable, highly distributed electrical heat load. The roll-out of installations is continuing into 2018. Thus far, data collected from initial customers has shown savings of up to 25% on energy bills. Perhaps more importantly, customers are reporting that the heating of their homes has been transformed and they can for the first time be warm when they want to be.

The project has shown that with a little piece of smart technology it’s possible to transform electric storage heaters into something more like a central heating system, bringing new levels of comfort, saving money and delivering services to balance the electricity grid.

Source: OVO

Case study: Smart Electric Heating

The Renewable Heat Incentive

As set out by Frontier Economics, on behalf of BEIS, in the September 2017 paper entitled ‘RHI Evaluation: Synthesis and by the National Audit Office’s recent report on low carbon heat and the RHI, there are a number of issues created by the existing structure of the RHI, which should be addressed without delay.

Issues which should be addressed as a matter of urgency include:

- Ensuring assignment of rights are implemented as scheduled to enable third party investment in low carbon heat and examining an extension of this to the non-domestic strand of the scheme for small to medium enterprises;
- Examination of a wider range of options including funding for low carbon heat rather than only renewables;
- Better targeting, particularly towards construction companies and housing associations to encourage adoption at a larger scale than single properties.

The RHI has, to date, failed to address the high upfront capital costs found in many low carbon heat installations, resulting in a disproportionate number of higher income businesses and customers. There would also be some related benefit in the RHI being available for new build, in the same way that the Feed-in Tariff is, in order to support, in the short-term, the deployment of heat pumps.

The RHI is inherently problematic for technology neutrality given the rising number of low carbon heat options available, compared to the small number of options eligible for the RHI.

At current, domestic RHI applications are primarily focussed on Air Source Heat Pumps (ASHP), and 86% of non-domestic RHI payments are awarded to Biomass installations. The Committee on Climate Change (CCC) recently recommended that government retarget the RHI towards heat pumps and biomethane, a suggestion which has its merits.

Issues which should be addressed as a matter of urgency include:

- The RHI is inherently problematic for technology neutrality given the rising number of low carbon heat options available, compared to the small number of options eligible for the RHI.

It is important that a domestic RHI should not attempt to target a specific policy area by, for example, only targeting those in fuel poverty or those off the gas grid, but should rather be as widely available as possible in order to enable the development of supply chains for low carbon heat technologies. The introduction of assignment of rights will be key to making the RHI more accessible to low income households and businesses. The RHI is best utilised as a low carbon market development tool, not as a social policy initiative. It is also important that government learn from the successes and failures of the Feed-in Tariff, given the impact of a sudden reduction of subsidy for solar installations.

Whilst there are a number of differences between the domestic and non-domestic schemes, Energy UK believes that both streams of the RHI should undergo a review of successes and failures, and be compared to a range of options for financing or regulating change. Applications for the RHI will be accepted until 2021, resulting in payments totalling £23bn out to 2040. As such it is vital that the RHI is reviewed in 2018 to ensure that it delivers value for money over its final years. The review should include a focus on addressing the upfront cost barrier of many low carbon heating technologies, and examine the trialing of low interest loans, financial tax incentives, and incremental changes to building regulations and standards.

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- The RHI is inherently problematic for technology neutrality given the rising number of low carbon heat options available, compared to the small number of options eligible for the RHI.
Case study: Blackburn Meadows

E.ON’s Blackburn Meadows biomass Combined Heat and Power (CHP) plant in Sheffield uses 200,000 tonnes of local, recycled waste wood each year, which would otherwise go to landfill. It’s one of nine E.ON CHP plants nationwide and part of their investment in this efficient energy source.

Blackburn Meadows powers 40,000 local homes and provides 30 local jobs. The district heat network also provides heat as hot water to local businesses, including Sheffield Forgemasters, Sheffield Arena and Ice Sheffield.

In 2017, E.ON added one of the first commercial battery systems installed in the UK, as part of an innovative 10MW scheme. The system will respond to frequency fluctuations within a second, absorbing or discharging power equivalent to half a million mobile phone batteries into the local distribution network, to maintain the power supply and quality.

Source: E.ON

Non-Domestic Renewable Heat Incentive

The primary function of the RHI should be on developing supply chains, and this should be done with a technology neutral approach. The non-domestic focus should, therefore, be in creating a business case for investment in low carbon heating. Government should consider ways in which the incentive can target small to medium enterprises (SMEs), as the RHI is currently primarily utilised by larger businesses. In order to increase uptake, there should be a method for communicating options available, and a set of guidance resources for SMEs and others.

As with the domestic RHI, local authorities have the potential to become leaders in the transition to low carbon, heat and the non-domestic RHI should enable this role to develop. This means that, again, the existing issue of poorly targeted funding for local authorities, due to traditional high carbon heating systems being the cheaper option, should be addressed to clearly encourage the use of low carbon solutions.

The Domestic Renewable Heat Incentive

In the transition to decarbonised heat, much of the coordination activity has been taken on by local authorities, given regional variations in housing stock and available resources, resulting in increasing difficulty in controlling the transition centrally. The domestic RHI must, therefore, be aligned with other available funding streams for local authorities, enabling the rollout of low carbon heat to council-owned housing. It is important that the drive to decarbonise domestic heat also include a focus on property developers, to ensure that low carbon heating is seen as an attractive option for both new build development and renovation work. Property developers are already able to receive a Feed-in Tariff for small scale generation assets, and the RHI should be extended to be utilised in a similar way. The incentive should also be targeted towards housing associations and other organisations or individuals which own a range of domestic properties.

Attempts to retarget the RHI to better appeal to those who own a number of domestic properties should be accompanied by educational resources to help organisations identify how the RHI can fit into financial planning. This will ultimately aid in the decision to invest in a low carbon heat technology, and potentially enhance the business case for third-party investors.

There is a high level of interdependency between energy efficiency and heat, and any move to reform the RHI should be aligned with efforts to increase energy efficiency measures. To address the high upfront costs of both energy efficiency and low carbon heating, Green Finance (e.g. Green Mortgages) could support regulatory changes. Government is already looking at how to develop a market for energy efficiency\(^2\), and should expand this conversation to include considerations of how heat, energy efficiency, and other low carbon technologies can be integrated into appealing options for customers and investors.

Government should look at how energy efficiency and heat initiatives, which should be funded through general taxation, could be used to aid lower-income households with the upfront costs associated with installation of low carbon heating assets. There is a need for fair recovery of cost of these incentives, and any policy which results in additional costs being added to consumer bills, would be unacceptable to consumers and industry alike. We note that recovering the costs associated with the decarbonisation of heat and energy efficiency measures through general taxation would be significantly less regressive than the current arrangements for the Energy Company Obligation (ECO) and Warm Home Discount, where costs are recovered from all customers energy bills, regardless of their ability to pay.
A Longer-Term Policy Environment for Decarbonisation

There is a need for greater certainty to be established ahead of the early 2020s to give certainty where possible on revenue streams and timelines for decarbonisation. In order to achieve this, government should conduct a full review of the regulatory and policy framework for low carbon heat and initiate and drive forward large-scale trials. Whilst it would be unfair to expect Government to know what mixture of low carbon heat solutions will be deployed over the coming decades, it is important to ensure that the policy framework set out delivers long term stability and certainty, providing consistent and clear messaging on direction to householders, businesses and industry stakeholders.

Energy UK and its members welcomed the publication of the Clean Growth Strategy, which showed a commitment from government to decarbonisation, encouraging industry, investors, and consumers to transition towards low carbon heat, energy, and transport. This being said, Energy UK found the lack of direction provided on the decarbonisation of heat to be concerning. It is important that, if we are to use the 2020s as a transformative period, as suggested in the strategy, the groundwork is laid over the next few years.

Over the past 20 years, a range of technology trials have resulted in the development of a range of low carbon heat technologies. This has resulted in a range of options for decarbonisation, each of which has its advantages and disadvantages.

Because of these differentiations and the nature of local differentiation, it is widely accepted that there is no silver bullet for heat, and that a mixture of a number of technical solutions will need to be used across the country. For the successful deployment of this patchwork method, it is vital that pilots and large-scale deployment trials are utilised to develop a comprehensive evidence base for future policy decisions and investment.

It is important that government approach the issue of decarbonising heat with a holistic view. This is not only in terms of the coordination of policies on energy efficiency and fuel poverty, although these will play an important role in the decarbonisation strategy. Policy coordination will also be needed in the form of greater recognition of the importance of the continuing integration of heat, transport, power and industry. Decarbonised heat should be a core focus of the UK’s Industrial Strategy in the 2020s and will be an important aspect of the ongoing work to establish a smart flexible energy system. For the UK to meet its emissions targets, government must approach decarbonisation with a whole-systems view.

Energy UK will publish a low carbon heat paper later in the year, laying out strategic decisions that need to be made to decarbonise heat out to 2050. Below are some initial considerations, which will be built upon in that work.

Enhancing Regulations and Standards

Funding and incentives offer an attractive option for encouraging change across industry and consumers but will always result in a level of uncertainty in the duration of central funding, given changing government priorities and unforeseen economic constraints. The implementation of a timeframe for regulatory changes and increasing standards, particularly for new build and major renovation projects, would complement any support scheme and give greater certainty to investors, and potentially result in change at a greater scale.

In light of the different regulatory frameworks in place across devolved governments and regional authorities, UK Government has an important role to play in ensuring that a coordinated approach is taken, enabling consumers, supply chain organisations and the energy industry to navigate the differing sets of rules and standards effectively. This coordination role needs to be carefully managed to avoid negatively impacting the ability of local and devolved governments to tailor their approach based on local circumstances.

Energy UK has consistently asked that government promote energy efficiency measures to a national infrastructure priority and continues to see this as a priority for enabling decarbonisation of the UK’s provision of heat. For this national programme to be successful, a number of regulations and standards will need to be developed as time goes on, and one option is that this process begins to integrate standards for low carbon heating as well.

In simple terms, the UK will see two to three boiler replacement cycles between now and 2050, based on a 10-15-year lifespan for the average boiler, allowing for targeted standards to be applied to phase out boilers as we know them today. These standards can be further reinforced with financing options like Green Mortgages, such as those being trialled as part of the Energy Efficient Mortgages Action Plan (EeMAP) or as explored as part of the Lenders project, and targeted tax incentives rewarding low carbon investment.

There will also be a role for government in encouraging and supporting improvements to the efficiency of gas, in terms of changes to the type of gas on the system, as well as in ensuring the network is efficiently transporting these gasses. Natural gas will continue to play a large role in heat for a number of years and, as such, efficient use of existing infrastructure should be maximised.

It is important that government approach the issue of decarbonising heat with a holistic view. This is not only in terms of the coordination of policies on energy efficiency and fuel poverty, although these will play an important role in the decarbonisation strategy. Policy coordination will also be needed in the form of greater recognition of the importance of the continuing integration of heat, transport, power and industry.

Outside of traditional heating systems, there is potential for the uptake of low carbon heating assets to be further encouraged by utilising building regulations and standards for new build which encourage long-term sustainability. This extends to the regulation of assets and district heating to ensure consumer protections are in place, improving upon the existing consumer experience of these schemes. Heat network regulation should also touch upon maintenance, efficiency, and the development of engineering specifications enabling for future expansion or integration of multiple sources of heat into a single district heating scheme. Standards and regulation should build upon the work being taken forward by the Heat Trust and the ongoing workstreams of the Each Home Counts Review.

Regulation also has a role to play in ensuring that markets for flexibility are technology neutral and accessible, as this will enable the flexibility resources associated with heat to be integrated into the energy system. Enabling these changes will establish an additional revenue stream for heat, making a range of emerging business models fiscally viable and addressing or reversing some of the capital costs of the transition to low carbon heating.
A Low Carbon Heat Incentive

Building on the NAO’s recent report, a comprehensive review of the successes and failures of the RHI should take place, and, dependent on those findings, a new, longer-term Low Carbon Heat Incentive (LCHI) running out to 2030 should be considered, alongside the introduction of enhanced regulations and standards. An important factor in the successful transition to low carbon heat is in government providing long-term certainty on incentive levels and long-term goals for the programme.

The timeframe for the scheme would depend on what it was designed to achieve, and it is, therefore, important to set out a series of measurable criteria for success. Success for any potential successor to the RHI should be measured in a number of ways, the first of which is in increased uptake of low carbon heat solutions and the development of sustainable supply chains for a range of low carbon heat systems in the UK. A successful scheme should deliver a clear set of fiscally viable options for the decarbonisation of heat. This would mean being sustainable for government and for the incentive to represent an attractive proposition for the consumer in their purchase of low carbon heating systems.

Success would also be seen in the development of competitive markets across heat, not only for customers, but in terms of competitive supply chain markets for technologies and fuels. Success would, in simplified terms, be seen in the removal of the need for an incentive.

There is a need for an evidence-based approach to be examined, particularly if the incentive targets a specific section of the population. The introduction of a longer-term evidence requirement may encourage better maintenance and an increased focus on ensuring certain levels of efficiency. This method will allow for the incentive to be modified based on emissions ratings.

Increased Support for Innovation, Research and Development

For government to make decisions on the future of heat in the 2020s, as stated in the Clean Growth Strategy, more trials at scale are needed in different regions across the UK to identify their impact on local energy networks. These trials must include aspects of energy efficiency measures, low carbon gas and a range of alternative heating assets if they are to be representative of the likely future heat mix in GB. The Clean Growth Strategy allocated a low amount of resource to the decarbonisation of heat (£277m in confirmed funding compared to the £3.5bn allocated to transport), showing an apparent lack of commitment to solving the issue.

There are a number of regions and cities across the UK which are prime targets for investment due to the potential for decarbonisation alongside relatively high potential for improvement to consumer’s quality of life, as seen for instance in the Wyndford Estate district heating case study below.

Research by IPPR has highlighted the potential for trials across the North of England, with a range of existing assets, including key Hydrogen production and CCUS facilities in Teesside and Liverpool, boosting the argument for large-scale deployment of solutions in the region16. A high number of fuel poor households and low energy efficiency standards also mean that trials in this area, particularly North Yorkshire and the Humber, would affect a social change as well as enabling decarbonisation. Trials for heat will need to be integrated into wider decarbonisation strategies, including for power and transport, and will need to include experts from a range of industries to make the best of the opportunity.

Energy UK members hold a range of experts and a broad knowledge base, some of which can be seen in case studies included in this paper.

The usage of waste heat could be a critical enabler for integrated decarbonisation efforts and further work is required to assess how to ensure this is efficiently deployed. Energy UK welcomes the Industrial Heat Recovery Support Programme and surrounding work to better integrate the wide range of sources of waste heat into the wider offering for consumers.

Work is needed to map out identified sources of heat against demand, and this will take a high level of coordination across sectors and across various levels of government.

Given the number of trials and initiatives being undertaken across the UK, it is important that improved information sharing is required from ongoing and future initiatives in order to aid in the creation of larger scale trials and inform policy and regulatory decisions.

Case study: The Freedom Project

The Freedom Project is a 27-month project programme looking at the opportunities and the implications for the consumer, network and energy system of multi-vector heating solutions. The project is seeking to build up a valuable evidence base on the potential for hybrid heat systems to improve the operation of the electricity distribution system and gas network as the UK decarbonises the heat supply.

Based in Bridgend, South Wales, the project has installed 75 hybrid heating systems, primarily air source heat pumps alongside conventional gas boilers, along with smart controls, in a mix of private and social housing. Optimised hybrid heating systems, making use of aggregated demand response controls, are used to provide fuel arbitrage and derive value from demand flexibility.

The Freedom Project will continue to gather and analyse data throughout 2018 and has already delivered valuable learnings, including that hybrid heating systems have considerable potential to help manage peak heat load and cut emissions in domestic heating; control strategy design is vital for efficiency and that once explained to consumers, over 90% find hybrid heating systems to be an attractive proposition.

Source: PassivSystems
The two-year project involved installing a 1.2 MW Combined Heat and Power engine, three 4.5 MW gas boilers, a 120,000-litre thermal store and 5km of underground insulated pipes as well as making a number of energy efficiency improvements. The new system resulted in a dramatic increase in user satisfaction, increasing from 27% to 70% for tenants and from 38% to 90% for owners. Thanks to the improvements, 8 out of 10 tenants and 9 out of 10 owners now feel warmer in their homes and report having to resort to extreme measures (such as going to bed early to stay warm) far less.

The project delivered important learnings, showing that it is not only possible to retrofit district heating systems, but that doing so can deliver significantly improved outcomes for residents. With heating emissions being cut by 62%, the project also highlights the important contribution that retrofitting district heating systems in combination with external cladding and other building fabric improvements can make to decarbonisation efforts.

Case study: Wyndford Estate district heating project

In 2012, Cube Housing Association partnered with SSE to retrofit a district heating system on the Wyndford Estate in Glasgow. The project aimed to improve comfort levels and the energy efficiency of almost 1,800 homes; mainly social housing with a small number of privately owned houses in an area with higher than average levels of economic deprivation.

The project delivered important learnings, showing that it is not only possible to retrofit district heating systems, but that doing so can deliver significantly improved outcomes for residents. With heating emissions being cut by 62%, the project also highlights the important contribution that retrofitting district heating systems in combination with external cladding and other building fabric improvements can make to decarbonisation efforts.

Conclusion

In order to encourage the higher uptake and acceptance of low carbon heat installations, it is important that government and industry work to educate customers on the options available and on how these affect energy bills and carbon emissions. Policy and regulatory decisions should reflect these targets and should be integrated across a range of sectors in a collaborative decarbonisation strategy. Whilst the Clean Growth Strategy goes some way towards showing government’s commitment to decarbonisation, it is important that this be followed by action.

Integrating policy goals on heat, power, transport, and industry will result in greater simplicity for businesses and consumers across the UK. Government should utilise the next three years to gather information by moving to resolve areas of no/low regret, building upon measures detailed in the Clean Growth Strategy. Energy UK recommends that a review of the regulatory framework for heat be conducted, and that this review include a focus on identifying methods to maintain and improve upon user experiences of heat, utilising appropriate best practice from the UK and other countries.

Energy UK recommends that government move past the development of technologies, recognising the efforts of industry and successful rollout of small-scale trials for low carbon technologies, and set out parameters for a series of large-scale trials. A high number of local authorities have taken strides towards decarbonisation, but central government support is required in terms of acting as a coordinator and aiding in the sourcing of funding.

Energy UK recommends that government move past the development of technologies, recognising the efforts of industry and successful rollout of small-scale trials for low carbon technologies, and set out parameters for a series of large-scale trials. A high number of local authorities have taken strides towards decarbonisation, but central government support is required in terms of acting as a coordinator and aiding in the sourcing of funding.

The Renewable Heat Incentive should be modified to allow for a greater range of technologies to be accessible to consumers, and fiscal support in the form of third party investment should be introduced by Spring 2018, as planned. This should be done as part of a wider review of incentives and funding available for all heating technologies and energy efficiency measures. Given the uncertainty as to what funding will be available for heat following the end of existing schemes, alternative solutions need to be investigated, modelled, and trialled across the UK. Energy UK and its members do not expect subsidy to continue in perpetuity, but would like to see consistent fiscal and regulatory policy continuing into the 2020s with measurable criteria for success. This would aid industry in overcoming existing barriers to consumer take up in terms of the availability and cost of low carbon heating solutions.

Energy UK is collaborating with BEAMA and the Energy Systems Catapult to examine potential business models for financing investment in energy efficiency and low carbon technologies on behalf of the consumer. We invite government and regulator to engage with this work as it progresses to explore methods for offsetting the capital costs of decarbonisation for consumers. Unlocking private investment in heat, energy efficiency, transport and smart appliances will encourage uptake and allow for government measures to make more of an impact.

Throughout the process of addressing the concerns outlined in this paper, it is important that the approach is coordinated across government and industry and that information is shared in open forums. The decarbonisation of heat is a momentous task for the UK, but the opportunities and benefits outweigh the challenges. For effective progress to be made in the 2020s, and for the UK to meet our carbon budgets, we must lay the foundations for this change now.