

Fuel poverty and renewable technology Innovative approaches to balancing sustainability and cost



Andrew Eagles Managing Director, Sustainable Homes



Michael Craggs Asset Management Director, Severn Vale Housing



lain Bevan Southern Sales Manager, Daikin UK

Sponsored by



Hosted by Severnvale

INTRODUCTION

The Green Housing Forum is a platform for social housing professionals to learn, network and to share ideas and best practice in relation to sustainability.

Fuel Poverty

Delegates from housing associations in the South West, Midlands and Wales came together at Severn Vale Housing's headquarters in Tewkesbury to discuss the issue of fuel poverty, renewable technology and innovative approaches to balancing sustainability and cost.

Discussions included how organisations might work together to procure energy and / or renewable heating products and how investing in new hybrid heat pump technology can deliver a measurable return on investment for both landlords and residents.

Speaker and panel profiles

Andrew Eagles

Managing Director, Sustainable Homes

Andrew is a driving force for sustainability. He regularly contributes to Government technical steering groups and national conferences. At Sustainable Homes he established SHIFT, the sustainability standard for the housing sector and currently oversees award winning consultancy and national research into issues intersecting sustainability and business performance in the housing sector. Andrew was previously awarded the Social Housing Green Champion of the Year.

Michael Craggs

Asset Management Director, Severn Vale Housing

Michael has more than 25 years' experience in asset management and construction, working in both the social housing and private sectors. He has extensive knowledge of property management and the interplay between housing investment, customer and community needs. Michael is passionate about improving energy efficiency in homes ensuring that customers benefit from the results of good energy advice and the use of renewable technologies.

lain Bevan

Southern Sales Manager, Daikin UK

Passionate about sustainability, Iain has twenty years of experience in heating, working closely with house builders, local authorities and housing associations to support the implementation of energy efficient solutions. Iain has years of experience of air source heat pumps and solar thermal products, ensuring that Daikin UK remains at the forefront of renewable heating technology in the UK.

Ciaran Cronnelly

South West Project Development Co-ordinator, National Energy Action

Ciaran is responsible for delivering National Energy Action's fuel poverty projects across the South West. Ciaran works closely with community groups, housing associations, voluntary organisations and local authorities to improve energy efficiency in the community and support households in fuel poverty. He is also the co-chair of the South West Fuel Poverty Forum.

Tim Knight

Chief Executive, Severn Vale Housing

Tim is a CIPFA qualified accountant who started his career at Grant Thornton, moving in to housing as part of a stock transfer in Worcestershire, following which he moved to Severn Vale Housing. Tim was appointed interim Chief Executive of Severn Vale in December 2013 and became permanent in July 2014.

Darren Sweet

Culture Change Facilitator, Severn Vale Housing

Darren joined Severn Vale Housing in 2011, working first in income management before moving into a business change role. He now supports the leadership team in the delivery of the change management aspect of Severn Vale's Transformation Programme.

Sponsored by

Hosted by





Andrew Eagles Managing Director, Sustainable Homes



Sustainable Homes is a leading not for profit consultancy and research body providing advice and assistance to the housing sector. Working with affordable housing providers, suppliers and government it represents one million homes and its mission is for every home to encourage more sustainable lives. Sustainable Homes' work includes research, independent benchmarking, training and assistance with improvement.

The sustainability challenge

When thinking about the nature of the change we need to see, it's useful to think about another sector altogether. Take Google's driverless cars as an example. Just as our children's children will one day turn to us in disbelief that we ever had to drive our own cars, in the future it will seem strange that houses were ever on gas. Carbon free futures are a future reality and because homes account for a significant proportion of overall emissions, housing plays a large part in that.

There are twenty six million homes in the UK. In order to ensure that global temperatures don't rise by more than two degrees, there needs to be a dramatic shift to prioritise renewable technology. The current scenario the world will face once we get above two degrees is extremely worrying and would lead to mass migration to higher or cooler land, poverty for millions and more. It is at this point that we risk the effects of global warming becoming irreversible. The challenge is very real - and we need to do something about it. The government's target is to cut UK carbon emissions by 95% by 2050. To meet the target, 625,000 homes per year need to generate 95% fewer carbon emissions. That's 14,000 homes per week that need to be more energy efficient - but so far only 1000 homes have been done - we are nowhere near where we need to be.





Fuel poverty and renewable technology Innovative approaches to balancing sustainability and cost Social landlords clearly have an appetite to do more, but the financial constraints of the 1% reduction in rent, right to buy, benefit changes and the removal or reduction of green incentives are hampering these efforts.

Despite this, the sector is still taking steps to support sustainability - so even though retrofit funding has been reduced by 66%, we know landlords who still have some funding, Green Deal Eco funding for SWI is available - and there are still eight million solid wall homes to complete. Some local authorities are also providing low interest grants and loans for retrofit - and at Sustainable Homes we are still being approached to provide investment plans in this area. But we recognise the challenge - it's getting harder and harder for the sector to do more than the bare minimum at a time when we need to be making a real difference.

On top of this, three to five million people still live in fuel poverty. Fuel poverty has a real impact on people's lives causing between twenty to thirty thousand excess winter deaths per year and twice the risk of respiratory disease.

In the UK we also spend the highest percentage of household spend in Europe on energy and SAP ratings don't take into account the measurement of drafts which can have a big impact on the energy efficiency of the home.

The Swanson Effect



The graph shows that the price of Solar PV reduced significantly as demand increased. If other technologies were procured at scale, the same effect could be expected.

Innovation

If you consider the cost of solar PV back in the seventies and compare it to now, you will see that there was a 99% drop in price as a result of increased demand. This is known as the 'Swanson effect' - the theory that the more you buy, the lower the cost becomes.

Doing things at scale is key to making sustainable solutions affordable and without central government co-ordination, collaboration between providers becomes ever more important.

Sustainable Homes has also been talking to the government about the possibility of flexible rents where investment in green technology that saves money for residents might be offset by a small increase in rent for those properties.

With around three quarters of all stock, the private sector also needs to do more. While EPC G-rated homes won't be able to be privately rented from 2018, the volume of homes that are privately owned means that they will be an area of focus.

A strategic approach

A number of landlords are taking steps to look at their stock strategically using Carbon Reduction Options for Housing Managers (CROHM). This housing stock assessment allows you to cost model your SAP targets so that you can better understand fuel poverty and carbon emissions and then take the most cost-effective steps to improve.

More widely housing associations are also asking how they can innovate - so how they can generate energy directly for example. As 60% of residents never switch their energy provider, there is potential win win here. Not only would residents potentially see lower costs, this approach could generate income for landlords and could also ensure that the resident gets an energy visit as part of the sign up process.

Severn Vale and other landlords have also looked towards renewable technologies - air source heat source pumps and new hybrids for example and we have more than 80 landlords signed up to SHIFT - the sustainability standard for the housing sector. SHIFT is an independent assessment and accreditation scheme that demonstrates organisations are delivering against challenging energy efficiency targets. It is recognised by the HCA and backed by Government.

Sustainable Homes is also exploring the potential link between energy inefficient homes and lost income around voids and arrears. A study exploring this will be published in 2016.

To find out more, visit www.sustainablehomes.co.uk

Sponsored by



@GreenHForum www.daikin.co.uk/greenhousingforum



Michael Craggs Director of Asset Management, Severn Vale Housing



Severn Vale Housing is a non-profit making organisation, created in April 1998 following a large scale voluntary transfer from Tewkesbury Borough Council. Severn Vale Housing manages in excess of 3,500 properties and provides services to over 5,000 customers.

Severn Vale Housing making a difference

Severn Vale Housing has just under four thousand homes, ranging from social and affordable rent to university accommodation and market rent stock. Altogether there are around 130 different archetypes across the stock base. We are fortunate to manage properties for other organisations too - and we also have a healthy new build development programme.

In recent years, we have focused heavily on data driven decision making - and the asset management system has been key to this. We implemented our asset management system Keystone and it has made a significant difference, allowing us to report effectively on stock condition and to understand the overall make up of our assets, including energy performance. Since 2008, we have improved SAP ratings considerably - and more than 65% of our properties now fall into the B and C bandings. While we have never employed a dedicated energy officer, we have focused on sustainability as a core part of what we do. We are part of a consortium of Registered Providers in the area and use this forum to share information including what has worked and what hasn't so that we learn from one another. This has been immensely beneficial.

We have also been proactive in seeking funding. While we've not been successful every time, we got Hard to Insulate funding and used this to insulate some of our more challenging properties. As we're in an area that floods, we've also learnt that fibre in cavity walls is not ideal where there is a flood risk.

Severn Vale SAP Ratings:

- 2015 average SAP rating 68.5
 2007 average SAP rating 57
- → 4% 'off gas' properties 2015 12% 'off gas' properties 2005





To achieve our improved ratings, we've taken a wide ranging approach. Since 2009, we have fitted solar PV panels on 73 buildings, including our own offices, installed 33 Daikin air source heat pumps and added a 9kw Daikin Altherma at one of our sheltered schemes.

We've also made good strides with insulation to improve the thermal comfort of our homes for residents. This includes some post war properties made from aluminium where we had to put in place a timber frame in order to insulate effectively.

We are also taking some smaller, but no less important measures including putting in place LED lighting in sheltered schemes and installing energy saving light bulbs in void properties for example.





We're not cash rich as an organisation, but we are customer focused and we have also made efforts to lobby government to get some money off the amount our residents pay when on prepayment meters where tariffs are generally higher - and we have worked closely with residents on energy switching too.

But, like all housing associations, we are facing a huge financial challenge. With the 1% rent cut it is not clear if we will survive as a standalone entity and with the government removing or reducing incentives for renewable technologies it is making it harder and harder for us to justify the spend on anything that is above minimum standards.

Despite the challenges, there are also opportunities. I have no doubt that there must be thousands of solar PV panels sat in warehouse somewhere as a result of the tariff changes. Maybe we could club together and buy these in bulk?

We could also create our own energy company - contributing to the surplus for us as landlords and helping our customers to have energy at an affordable price. Working together is going to be key to achieving the pricing that makes sustainable solutions more affordable.

I also want us to think about new build. Retrofit is important, but as we are building new properties, we need to think about what is needed to avoid having to go back and retrofit in the future. They key is collaboration - if we work together and adapt, we will have the scale to make a difference.

For more information about Severn Vale Housing, visit www.svhs.org.uk

Sponsored by

DAIKIN

@GreenHForum www.daikin.co.uk/greenhousingforum



lain Bevan Southern Sales Manager, Daikin UK



Daikin UK, sponsor of the Green Housing Forum, is a leading supplier of renewable heating systems to the social housing sector. Its products include air source heat pumps and hybrid heat pump technologies that are designed to significantly reduce carbon emissions and to help residents to save money as well as maximising the potential RHI returns for landlords.

Rethinking heating

Shelter and warmth are basic human needs - but with fuel poverty growing and with the need to simultaneously reduce carbon emissions, it's clear that more needs to be done to embed sustainable solutions. Traditionally social landlords have been amongst the early adopters of renewable technologies and while there's always an appetite to do more, we recognise the increasing financial constraints that organisations are facing. We're keen to be involved in the Green Housing Forum because it gives us a chance to listen to a wide range of views and issues and to work together on solutions.

From a supplier perspective, the heating market can be broadly split into two segments - new build and renovation or retrofit. Traditionally, when we have talked about renewables we have tended to focus on those properties that are off gas. Yet gas boiler replacement represents about 70% of the renovation that is undertaken - so it's an area where we could and should be having an impact. Only four million properties are off gas in the UK compared to twenty one million that are on gas - so heating solutions which reduce gas usage are where we can provide assistance and have significant impact. Up until recently this has been difficult for us, but by working with Registered Providers and listening carefully to what they and their customers want, we're starting to make inroads into more traditional heating.

Daikin has developed the Daikin Altherma Hybrid Heat Pump in response to resident needs for a product that is both cost effective and familiar, and the landlords' need for technologies that improve SAP ratings and that are value for money. The Daikin Altherma Hybrid Heat Pump works with existing radiators, which means that we can start introducing renewables to those people who wouldn't ordinarily think about them. Because heat emitters don't need to be replaced for landlords, the hybrid can reduce the capital cost of installation, and since the hybrid uses a heat pump, it is eligible for RHI income to help off-set the investment cost.



Fuel poverty and renewable technology Innovative approaches to balancing sustainability and cost

The Daikin Altherma Hybrid

So how does it work? We've simply combined our latest most efficient low temperature heat pump with a new condensing gas boiler. The two can run together, or can run separately. The heat pump provides heating most of the time with the boiler as a back up, and the boiler provides the hot water. The hybrid combines two existing and well tested technologies together. This is a heat pump we know and love and that we've been manufacturing for many years, combined with a leading gas condensing boiler - the clever bit is how we combine the two.

The household demand for energy can be plotted as a curve. The bulk of heating is required when the outdoor temperature is between plus 5°C or 6°C down to -3°C or -4°C. The heat pump can comfortably look after heating for property at these temperatures. If it gets colder, both the heat pump and the boiler run together - and at even colder temperatures the boiler takes over.

The hybrid looks at the electricity price, the gas price, the temperature outside and the temperature that's wanted inside the building - and then works out the most cost effective way to deliver that heat. You manually enter the prices to allow it to be intelligent - it's simple to do and can be reviewed once a year as part of servicing, or more frequently if tariffs change in the interim.

Switching logic - an example

In this example, we will use a gas boiler. Let's say you need 1kW of heat from it and that the boiler is 90% efficient. At 90% efficient let's assume we pay 5p per kWh for gas.

In reality, to get 1 kW per hour, we have to put a bit more in because it only runs at 90% efficiency. So the truth is that it actually costs 5.5 to 6p per kWh because you have to put that bit more in to get the 1 kW out.

With a heat pump it works slightly differently. At higher ambient temperatures, the heat pump can be up to 400% efficient. So let's assume you want the same 1 kW of useful heat output, but are paying 15p kWh for electricity. However because the product is more efficient, we only have to put a quarter of a kilowatt in. This then costs 4p, giving an immediate saving against gas of 2p per KW hour.

However, unlike boilers that maintain constant efficiency at all ambient conditions, the heat pump's efficiency varies with external temperature. It becomes less efficient in colder temperatures as it has to work harder to scrub the heat out of the air. Even in the lower outdoor temperatures the heat pump works at 200 - 250% efficiency and at this level it is comparable in cost to gas.

Because the balance point of the most efficient technology moves all the time depending on the ambient conditions, the hybrid recognises which is the most efficient heat source and will ultimately be more efficient - and save the user money.

From a usability perspective, the householder uses the hybrid in the same way as a normal heating system. It is serviced and maintained in the same way as a normal heat pump and boiler.

Additional RHI benefits

The other benefit of hybrid that it is eligible for the domestic RHI on the portion of renewable energy generated by the heat pump. Daikin supplies a meter and installation instructions to enable this to be measured so that information can be submitted quarterly to Ofgem. The hybrid is treated like an air source hest pump so the current heat pump tariff rate applies of 7.42p p/kWh.

Example:

Let's assume 11,500 kWh are needed to heat our first house which is on natural gas. The efficiency of the hybrid heat pump is about 350% and the RHI is paid over 7 years. In this example house you would get an income of about £2100 over seven years based on the heat pump delivering about 50% of the heat load. If we make radiators bigger, the heat pump can cover more of the heat load, increasing the RHI payment.

Independent evidence

The following table sets out an example of the independent monitoring of Daikin's Altherma Hybrid carried out by Leeds Beckett University.

Monitoring period: 1st April 2014 - 31st March 2015

Original - Night storage heaters:

- Heat load: 5kW
- Comparable cost: £178

Now – Radiators:

- Heat pump: 340% average efficiency
- Coverage: 63% of heating demand
- RHI payment to Severn Vale: £113 per quarter
- Actual cost: £144
- Saving to resident: £34

New build

Using the hybrid in new build homes can have impact on your dwelling emission rate against your target emission rate in SAP. The Building Research Establishment (BRE) modelled the hybrid using SAP in various homes, ranging from a 60m² flat up to 400m² detached houses. The boiler for the flat showed only 8% improvement, whilst the hybrid showed a 16% improvement. For the 100 metre square detached house, the hybrid showed an 11% improvement and for the largest house the improvement was 15% - against just 4% with a boiler alone.

To find out more, visit www.daikin.co.uk/hybrid

Sponsored by





Roundtable One

Facilitated by Iain Bevan Southern Sales Manager, Daikin UK



With funding becoming more limited and direct incentives for the implementation of green technologies being less certain, what are you doing within your organisation to make the case for continued investment in sustainable solutions? What additional support or input do you need to do this?

The main focus of our discussion was the capital costs of renewable technology compared to traditional fossil fuels. Social landlords are very willing to engage in sustainable solutions, in fact most are eager to explore what can be done, but there is always the balance between initial outlay versus longer term return. We all agreed that this is often a barrier and that the best way to overcome it is to look at economies of scale which in turn could help suppliers and installers to reduce costs.

We then started talking about whole life costs, and the greater help that suppliers could give to enable organisations to look at more than just the initial investment and to derive comparative whole life costs. We can definitely do more here and that's something I will be taking away to look at. Procurement approaches were discussed and we started to think about consortia to achieve greater efficiencies from increased scale.

There were a few examples around the table - the consensus was that when this is done well, it can work brilliantly, but there were also examples of it not being done so well. From a supplier perspective, we are always going to be more cautious with pricing the framework with several other suppliers.

Ultimately, if manufacturers and installers can supply in bulk, they can then pass on the economies of scale.

Another benefit of a larger scale approach is that it allows suppliers to focus heavily on supporting installers in the area and on ensuring that customer support is there if needed.

Where we are able to work with social landlords on a specific project, we will work closely with residents to show them how the technology works and how to use it, providing both information and reassurance that ultimately will enable greater energy efficiency - and will reduce the time burden to the landlords themselves.



Roundtable Two Facilitated by Michael Craggs Director of Asset Management, Severn Vale Housing

To what extent have the pressures on housing sector finance overall had an impact on your organisation's plans for sustainability? How can suppliers and other partners best support you to achieve your targets?

We kind of took the Dad's Army approach, starting with the phrase 'we're all doomed!'

Seriously though, some colleagues around the table are affected by tens of millions of pounds of cuts as a result of the rent decrease, which inevitably means that we all need to do things differently - and we need to think carefully about what we stop doing. While we all have links to neighbouring organisations, what we are missing is scale and co-ordination. We all agree that the only affordable way of investing in green technologies without government support is to scale up - and there's nothing to stop us setting up our own consortia. The issue is having the capacity to get it done - we considered whether suppliers and partners might be able to help with that. We also asked whether all suppliers are really aware of what is happening in the sector. At times of financial pressure, it may be necessary for associations to pull back from this agenda a little. We've all pushed forward for ten to fifteen years, but that has been with some support and in a very different operating environment. Given the financial constraints that the sector faces, everyone is looking at all aspects of their business - and it may be that this is an area where we need to take a step back. It's not what we want to do - it's purely about the affordability of doing more than the minimum when we consider sustainability against our other priorities.

At a local level, it would be beneficial for planners to stipulate stronger, above standard, planning requirements as this would force all of us to be smarter about this, to give us an absolute imperative. Equally we need to work closely with local authorities to maximise opportunities and to look outwards to the private sector as the social rented sector on its own is not going to resolve the issue.



Sponsored by

DAIKIN



@GreenHForum www.daikin.co.uk/greenhousingforum

Roundtable Three

Facilitated by Martyn Ford Renewables Solutions Consultant, Daikin UK



Do residents see rising fuel costs as a problem and does this have an impact on how they heat their properties?

There was consensus that tenants see rising fuel costs as a problem, however there were mixed opinions as to how much tenants were aware of what is in their own control and also their understanding of the impact of improvements.

There was a feeling that the energy efficiency improvements completed by housing associations around the table hadn't really been seen to be as beneficial as they actually have been by residents - mainly as a result of the simultaneous increase in fuel prices - so the positive impacts are less noticeable given the wider factors.

The other thing that the table discussed is that typically residents don't really understand their energy bills - and despite changes that have been made to how they are laid out they remain complicated. This in turn makes comparison quite difficult and switching still isn't straightforward either. More support for residents in relation to their bills and switching would be helpful, particularly if this enabled them to save money which in turn could have an impact on reducing fuel poverty but also potentially on arrears. We were all worried that one of the impacts of rising fuel costs might mean that residents only heat the room that they are in - which in turn inhibits thermal comfort and may impact on health.

There's no question that the health of residents is affected by fuel poverty - winter deaths and respiratory diseases are just a couple of the problems. Given the links between housing and health there is the potential to deliver some innovative work in this space with our NHS colleagues and it's something that is under exploited. Some housing associations are proactively pursuing these links but there is no national or regionally consistent approach at present.

Finally, higher fuel prices and poorly heated homes will also mean that there is an impact on the quality of the property too. As landlords we all know that mould is a common problem and very often it's down to resident lifestyle factors rather than other causes. The cost of redecoration is an issue, as is the cost of managing contacts from customers in relation to issues that should be avoidable with the right information and behaviours at the outset.



Roundtable Four Facilitated by Tim Knight Chief Executive, Severn Vale Housing

To what extent is the impact of fuel poverty understood across the different roles in your organisation and how does support for sustainability manifest itself to your tenants? What more could be done?

The simple answer is that we don't know. If people are in rent arrears we know that they are likely to be in fuel poverty. But would our operatives out in the field recognise fuel poverty day to day? Would they know what to do? The answer is almost certainly no. But if we are serious about being customer centric then they should do. There are definitely opportunities around staff training and education.

More widely it's interesting that the education system at the moment is predicated on academic success, but youngsters also need to know about how to run a home. Not only that, what was right for this generation might not be what they want for the future - young people are much more engaged and bought into the sustainability agenda than older generations - we need to involve our tenants of tomorrow in the decisions we are taking now. This is their future and they should be involved in the conversations - down to the basics like are we putting in baths when they want showers, do they want gardens or hard standing? We've got to engage with schools - but that's not an easy task - and brokering that conversation might be difficult - and also takes time, which again is a cost.

Then we have the other end of the spectrum - we looked at the fact that the government wants us to downsize older people into smaller homes, both to make it more manageable as people get older, but also to release much needed stock to ease the housing shortage. Our collective experience is that this is easier said than done and the tipping point for the change typically comes at about age 70 and as a result of circumstances - maybe a partner dying, or a fall, or, for some, the need to release equity. Downsizing might seem like common sense, but customers don't necessarily see it that way and are very emotionally attached to their homes and communities. In the context of energy efficiency and fuel poverty, the linkage between high energy bills and size of property is very often overlooked.

The final thing we shouldn't lose sight of is that we only manage 25% of stock. We must remember that 75% of stock is in the private sector - could we - and should we work more closely with private landlords to raise standards and to achieve economies of scale overall? How might we do this? There are no easy answers here and it is going to take a leap of faith to achieve the scale of the change needed.



Sponsored by









Revolutionise the energy efficiency of your housing stock and reduce tenants' fuel bills by partnering with Daikin UK.

The Daikin UK renewable heating team offers everything you need to upgrade tenants' heating systems, reduce running costs and carbon emissions from homes:

- > Market-leading, MCS accredited Daikin Altherma heat pump solutions
- > Full range of renewables for new build and refurbishment programmes
- > Advice on designing and selecting high efficiency, low temperature systems
- > Tenant presentations and consultations
- > Guidance on RHI funding applications and advice on RHI metering requirements
- > All-in-one heat pumps for easy installation

Find out more on www.daikin.co.uk/domestic or email heating@daikin.co.uk