The conducting agency Customer Plus is an independent customer experience consultancy specialising in research, strategy, communications and training. Customer Plus is a Market Research Society (MRS) company partner and strictly adheres to the MRS code of conduct.

National Energy Foundation (NEF) is an independent charity that has been at the forefront of improving the use of energy in buildings since 1988. NEF aims to give people, organisations and Government the knowledge, support and inspiration they need to understand and improve the use of energy in buildings.

**CAPITA**

Our Property and Infrastructure (P&I) business delivers design, infrastructure, management, real estate and outsourcing solutions on a local, national and international scale.

Our footprint in the energy sector is extensive and we have a strong track record in enabling and delivering domestic energy efficiency schemes.

We are the lead delivery partner for RE:NEW – the Greater London Authorities flagship domestic energy efficiency programme. To date, we have helped over 70 organisations in London to deliver over £120m of retrofit projects.

The Applied Buildings and Energy Research Group has been established at the University of Salford to address issues of energy use in buildings. The focus is practical and as such covers issues ranging from monitoring energy demand, people and designing and delivering effective solutions to improve the performance of our buildings, as well as wider industry studies.

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To put it mildly, 2016 was a year of political change – on many levels! The housing sector is no exception and Registered Providers have had to contend with some challenging policy changes - not least the reduction of rents by 1% per year for the next four years. These changes have resulted in a mix of financial pressures and an increasingly complex operating environment.

At the same time, the drive to increase property development rates, diversify commercial services and deliver substantial savings across operating costs have also contributed to the challenging context. However, we all know that fuel poverty, health and environmental concerns make retrofitting our housing stock imperative.

The State of the Nation report, now in its third iteration has tracked the attitudes of the UK’s housing sector towards energy saving retrofits, the opportunities and barriers. Between them, respondents to our latest survey on retrofit represent over 50% of the UK’s housing stock and our leading theme within this summary report describes how the sector is willing and increasingly able to deliver.

Despite the contextual challenges, the survey shows that Registered Providers continue to take retrofit seriously and its impact on tenant welfare. There is a clear recognition that providing residents with warm, affordable homes is now vital as energy prices and the general cost of living look set to rise.

We are seeing the sector do more of what it can do very well – innovate to overcome challenges. We have found that organisations are innovating in three key ways: through collaboration with other partners and service providers, through engaging with technological innovations and through using keen data analysis to hone their investment planning.

The use of data analytics to underpin intelligent asset management, driving efficiency through work programme optimisation and exploiting new technologies and business models such as Energiesprong are all helping to re-write the business case for retrofit.

The scale and the benefits of the retrofit challenge are significant – we will need all of the effort, collaboration and commitment suggested in our report to make it happen.

Richard McCarthy
Executive Director at Capita Property and Infrastructure
In a follow-up to studies undertaken in 2010, 2013 and 2015, this survey sought views on opportunities, challenges and progress within energy efficiency retrofit in the UK social housing sector.

The survey was undertaken in September 2016 and was carried out via an online survey portal. We estimate that between them, respondents manage approximately 2 million properties, 50% of the total social housing stock.

The report identifies a series of insights that align to the following key themes.

- **Theme 1** – Registered Social Housing Providers willing and able to deliver.
- **Theme 2** – The importance of good data and making the business case for retrofit.
- **Theme 3** – Technology adoption and performance monitoring and evaluation.

We consider each of these themes not only as a means to structure findings but also as topics which the sector must focus on when considering retrofit or indeed sharing best practice. The social housing sector has done considerably more than any other sector in the built environment when it comes to energy efficiency and sustainability, yet findings detailed here illustrate that considerable opportunities remain.

The sector faces a number of growing challenges, just some of these include; the need to cut social rents by 1% per annum to 2020, combined with Welfare Reform (Universal Credit, benefit cap changes, Pay to Stay, under occupancy), reduced local authority funding for supported living, Right to Buy, and pressures to simultaneously increase new supply. In the context of these challenges, energy efficiency retrofit ranks as the 5th toughest facing the sector.

Whilst we have seen retrofit rank more highly as a challenge in previous years, this perhaps highlights that rather than retrofit being less of a priority, there is simply increasing pressure for Registered Providers to do more with less. This, in our view, highlights an opportunity for innovation in enabling the interrelationships between many of these challenges to be identified and addressed in a more holistic manner.

For example:

- Energy efficiency and wider stock investment serving as a means to mitigate the risks posed by the introduction of universal credit and wider social instability/vulnerability.
- Clear organisational data strategies and stock investment/divestment plans that enable the optimal social and financial investments to be made.
- Joint strategic asset management and development plans that intertwine new-build development with investment into existing assets.

Only 40% of social landlords feel retrofit is actively championed at board level. This is a disappointing decline from last year’s survey result of 60%. This drop is likely due to the other pressing challenges outlined above and is compounded by a lack of funding and an unproven business case which social landlords (79%) cite as the main barrier to retrofit. If silos can be broken down and investment looked at more holistically, energy efficient retrofit can and should become a clear and commercially attractive investment option.

We would generally expect Government policy and targets to have taken greater precedence as a driver for retrofit but only 41% of respondents felt that this was the case making it the 3rd highest key driver. 84% of respondents deemed reducing fuel poverty and affordability as the biggest key driver, with organisational commitment following on at 54%. In contrast, 59% of respondents felt that a lack of policy direction from the Government was a barrier towards installing retrofit measures.
**Retrofit in numbers**

**The North**
Top priorities: Fuel poverty, tenant health and reduced fuel bills
Lowest priorities: Resident demand and climate change
Key barriers: Lack of funding and other organisational priorities

**The Midlands**
Top priorities: Fuel poverty, tenant health and reduced fuel bills
Lowest priorities: Resident demand, available finance, increasing asset value and climate change
Key barriers: Lack of funding and other organisational priorities

**London**
Top priorities: Fuel poverty, tenant health and reduced fuel bills
Lowest priorities: Climate change and generating income from renewables
Key barriers: Lack of funding and planning issues

**The South**
Top priorities: Fuel poverty, tenant health and reduced fuel bills
Lowest priorities: Climate change and generating income from renewables
Key barriers: Lack of funding and planning issues

Total stock: 4,012,000
Number of Registered Social Landlords: 1,794
Average median spend per RSL: £1,304,411
The overwhelming driver for retrofit in the sector is reducing fuel poverty and improving affordability for tenants with 84% of social landlords citing this as their primary motivation.

This finding is consistent with last year’s survey result of 83%. Organisational commitment was cited as the second reason with 54%.

The two least cited reasons being “Generating income from renewables” (11% of responders), and “Resident demand” (14%).

What is particularly encouraging is that the sector continues to invest, with respondents having reportedly invested in excess of £120m of their own internal budgets on retrofit in the last 12 months.

It is clear however that the sector also recognises that further funding and investment is needed in order to deliver the deep whole house retrofits that are required, with 79% of respondents also citing lack of funding as a key barrier.

It has long been recognised that the social housing sector is well placed to serve as a market catalyst for retrofit and this finding further reinforces this. There is a clear opportunity for the Government and the private sector to better leverage existing Registered Provider investment in the retrofitting of the housing stock.
Energiesprong UK
Case Study

Energiesprong - literally translated as ‘energy leap’ - is a step change in the UK housing market and pushes the boundaries of sustainable development, performance and versatility. The Dutch concept offers a radical approach to retrofit and regeneration which involves wrapping an existing dwelling with highly desirable, customised, wall and roof panels optimised for off-site manufacture, to deliver a super insulated, low maintenance house with an assured energy performance.

What is particularly innovative is the whole life approach to finance, with the price of the works equal to the expected planned maintenance costs and energy savings over a 30 year period. This has the potential to attract considerable private investment into the sector, backed by the skills of the social housing sector to manage and maintain assets and rental/service charge revenues.

Energiesprong UK aims to transfer the Dutch concept to the UK market with UK companies and supply chains developing competitive Energiesprong solutions. Working together at this early stage is enabling all the participants to collectively change the market conditions so that net zero energy housing can become a reality - at an industrial scale and pace, thus making it commercially and environmentally attractive.
Theme 1

Registered social housing providers willing and able to deliver

To what degree is your organisation’s aim to improve the energy efficiency of the stock integrated into ongoing asset management, rather than seen as a standalone exercise?

What are the key drivers to encourage your organisation to install sustainable retrofit measures in your housing stock?

Government policy and targets | 41%
--- | ---
Organisational commitment | 54%
Available finance | 41%
Resident demand | 14%
Climate change | 17%
Reducing fuel poverty and improving affordability | 84%
Improving tenant health | 27%
Maintaining asset value/stock condition | 27%
Increasing asset value/stock condition | 22%
Maintaining lettability of property | 19%
Reduce risk of tenants in arrears | 14%
Generating income from renewables | 11%
None of the above | 3%

What are the key barriers which are preventing you installing sustainable retrofit measures in your housing stock?

Lack of clear policy direction from the Government | 59%
Lack of funding and an unproven business case | 79%
Lack of technical knowledge | 16%
Difficulties in procurement | 12%
Planning issues | 20%
Limited supply chain skills, knowledge and capability | 13%
Resident resistance | 13%
To much long term risk e.g. defects | 27%
Commercial difficulties e.g. failure to establish strategy | 28%
Lack of in-house awareness of opportunities | 27%
Other organisational priorities | 42%
None of the above | 6%
Government policy shifts have created the three greatest challenges for social landlords wanting to upgrade their stock. The Rent Reduction Commitment and general economic conditions were almost universally cited as the greatest challenge. Some way behind was the pressure to supply new affordable housing and Right to Buy.

1. “Government policy is very unstable and leads to industry uncertainty”

When asked to identify the four key barriers to installing sustainable retrofit measures, the top two were “Lack of funding and an unproven business case” (79%) and “Lack of clear policy direction from Government” (59%). The least cited reason was “Difficulties in procurement” (12%).

2. “Lack of appetite to commit scarce capital funds to energy retrofit”

For some organisations this is particularly severe; one respondent said “The introduction of Right to Buy has significantly reduced spend on anything other than essential structural asset works”. A succession of policy changes and funding cuts has reduced capital funding availability and impacted long-term investment plans.

Despite these circumstances most landlords continue to invest to some extent. The most common spend was £0-£500k, with just under half of social landlords falling into this bracket. However, 42% have spent over £1m with 7% having spent £5m+. Using these responses as a basis, we estimate that overall the total level of direct investment has been in excess of £120m in the last 12 months. This is a clear sign that the sector is not wholly dependent on external funding support and that the sector has the willingness and capacity to continue investing in retrofit if the right market conditions exist.

3. “Funding is too complex and unreliable, and there is a lack of in house knowledge”

Social landlords use a variety of funding sources, depending on their size, status, and knowledge. 85% have funded projects from internal budgets and many respondents identified a lack of available external funding, although over half of the organisations have accessed ECO funding (52%). The take-up of Green Deal has been extremely limited with only 3% accessing it. Multiple barriers to finance were cited, including lack of internal knowledge, complexity and “strings” attached to external funding. Some respondents expressed frustrations at having to use utilities contractors in order to access ECO, with social landlords strongly preferring to use existing maintenance delivery partners (67%) or recognised procurement frameworks (64%) to undertake retrofit works.

One respondent quoted, “A company offering ECO wanted to carry out works via its own team but proposed costs did not prove to be value for money”.

79% of respondents felt that a lack of funding and an unproven business case was the main key barrier which stood in the way for retrofit installations.

Despite commitment to varying levels of investment in retrofit, challenges in procuring contractors also exist, with social landlords citing each of the following reasons; finding suppliers with requisite skills and knowledge, speed of appointment, ensuring compliance and avoiding challenge, aligning specific needs of the project to internal procurement procedures.
Theme 2
The importance of good data and making the business case for retrofit

For retrofit to become a higher priority and be delivered at scale, lower capital cost of energy efficiency upgrades and better data to improve how the business case for retrofit is made are ranked as the most important factors. This is reflected in the variety of approaches adopted by social landlords to scheduling retrofit works, with 40% installing measures as both standalone and integrated within a programme. About a fifth of social landlords fully integrate and plan installs into each and every work programme to maximize opportunities, another fifth apply measures as a standalone or on trials due to the nature of available funding.
Enabling the connection between energy efficiency and sound commercial decision-making relies on data. However, low confidence in stock data is widespread, 44% of Registered Providers had low to medium confidence in data relating to the energy efficiency of their housing stock e.g. glazed areas, heat loss boundary conditions, boiler efficiency etc.

Which of the following best describes your level of confidence in the accuracy of your stock condition and asset management data?

The demands placed on Registered Providers of social housing and their assets have evolved considerably in recent years, with Registered Providers needing to think far more strategically about how they monitor performance and invest/divest in their portfolios.

However, asset, resident and housing management data is rarely brought together to fully inform investment decision-making and, if it is, there tends to be a culture of siloed thinking. For instance, financial, social and environmental issues are all too often looked at individually by different departments, and rarely considered as a whole. New ways of defining, gathering, aggregating and analysing asset information is needed.
National Energy Foundation iAIM Case Study

The iAIM tool has been developed following a 12 month research and development project with Joseph Rowntree Housing Trust. The purpose of the project and the resulting tool has been in response to the increasing need for providers of social housing to appraise the performance of their housing stock portfolios in a more holistic manner. In our experience, matters concerning energy, the environment, resident affordability and wider neighbourhood quality are rarely factored into traditional portfolio performance appraisals, which tend to simply rank assets on a financial net present value (NPV) basis.

Starting with an innovative whole-stock minimum data set of 30 items per asset, the iAIM tool visualises holistic portfolio performance, in line with strategic objectives. The outputs from the tool currently include a baseline indication of overall portfolio performance, clear visualisations of the financial, social and environmental performance of a portfolio as well as causes and effects on performance for every asset and feedback on data completeness, quality and opportunities for improvement.

"iAIM enables the Joseph Rowntree Housing Trust to: refine our disposals register; prioritise social, economic and environmental value; measure the impact of our investment works; and replace our social value statement with social value outputs from the tool." Owen Daggett, Sustainability Manager, JRHT

GLA RE:NEW Case Study

RE:NEW is a programme that aims to reduce carbon emissions and energy use in London homes by assisting housing associations to implement retrofit projects through provision of a support team and supplier framework.

The RE:NEW support team undertook business case analysis with Orbit Housing Group. RE:NEW analysed 90% (over 27,000) of Orbit’s housing stock to establish savings against the cost of investment in retrofit. The impact of 5 cost variables were analysed; repairs, customer contacts, voids, rent arrears and complaints.

The report, Positive Energy - the business case for retrofit, identified a clear link between increased energy performance and lower housing management cost with predicted savings of over £4m in management costs, over a 20-year period. The savings do not include any grant funding.

Salix Homes Arup SROI Case Study

A Social Return on Investment Study (SROI) was undertaken by ARUP on behalf of Salix Homes to examine its retrofit programme, which involved an entire estate of terraced properties being brought up to the Decent Homes Plus standard. This involved the installation of: new boilers, external wall insulation, mechanical ventilation with heat recovery, new kitchens and bathrooms and house re-wiring. Energy consumption data was collected for each home pre and post retrofit. ASROI was conducted taking into account all stakeholders (Salix Homes, tenants, local and national Government, environment). The study found that at least £1.60 of social value was created for every £1 invested by Salix Homes.
Key Findings

- Properties in EPC bands E, F and G have 48% more repairs relating to damp and mould growth than the stock average.

- The number of customer contacts can be reduced by 75,300 over 20 years.

- Poor energy performance results in nearly 3,000 additional customer complaints over a 20-year period.

- Properties in EPC band D or below have longer void periods than the stock average; equivalent to 600 extra voids over 20 years.

Technology adoption and performance monitoring and evaluation

How’s the landscape changing – is confidence increasing, are new technologies being considered, what’s the block?

The technologies included in refurbishment that respondents were most confident in were loft insulation and boiler replacement, closely followed by thermally-efficient doors and windows. This perhaps reflects the length of the social landlords experience with these technologies, and a proven supply chain. The technologies with the lowest confidence levels, again perhaps reflecting experience, were biomass boilers, followed by combined heat and power and heat pumps. Perhaps more surprising given recent concerns over quality issues, respondents are fairly comfortable with solid wall insulation ranking it 7th of 15 technologies.

Technology adoption and the ongoing monitoring and evaluation of performance in-use is a particularly interesting theme. With almost all of the social housing stock now to the Decent Homes Standard, and little in the way of further energy efficiency related regulation, retrofit investment decisions are entirely in the hands of the Registered Providers. This has resulted in varying degrees of uptake across a wide range of technologies, with investment choices perhaps more considered than ever before. Without targets or standards to work towards, the Registered Providers must set their own goals and put in place retrofit investment strategies that not only align with strategic objectives, such as addressing fuel poverty and affordability, but which are also cost effective and align seamlessly with existing planned asset management programmes.

- 45% of respondents, stated that their organisations spent between £0-500k on retrofit projects in the past 12 months which may suggest smaller and less complicated retrofit projects were undertaken.
- Less established heating technologies such as solar thermal, CHP and heat pumps were all ranked 3-4 out of 5, as was internal wall insulation.
- Biomass boilers inspired the least confidence with a lowly 2.6 out of 5.

As organisations consider where to spend their limited resources, it is clear that they remain wary of less conventional and widely used technology.
Given the inclusion of many new technologies, some might consider that social landlords will monitor projects to review their performance. The survey found that detailed monitoring was the exception, with the main barriers being cost and concerns over access. Knowledge as to what to monitor and assess was also a barrier, as one respondent put it, the barrier is, “Knowing the right questions to ask and how to design”.

The questionnaire also asked respondents to identify whether they were “interested but not delivering”, “not interested”, or “already delivering” against a list of ten new technologies and approaches. The highest scoring areas for “interested but not delivering” were for “collaborating with other Registered Providers and local authorities to deliver community-wide retrofit”, and “working with the health sector to deliver retrofit” (each cited by 73% of responders). In each of these cases a number of respondents identified that they were already delivering in this area. Of interest, and with a relatively low respondent rate of already delivering, were “smart grids and battery storage” and “new business models for renewable energy projects e.g. third party finance for solar”.

**Key Findings**

**RENEWABLES**
The industry has the most confidence in PV and the least in biomass boilers.

**INSULATION**
The highest level of confidence is in loft insulation followed by cavity wall. External wall insulation is preferred to internal.

**TRIALS**
The most trialled technology is smart meters.
How would you describe your organisation’s current approach to the following?

New models of local energy supply

Whole-house retrofit solutions

Battery storage

Offsite manufacture of retrofit fabric solutions

Big data including smart meters, monitoring and use of sensors

Smart grids and battery storage

New business models for renewable energy projects e.g. 3rd party finance for solar

Working with the health sector to deliver retrofit

Collaborating with other Registered Providers and Local Authorities to deliver community wide retrofit

Behaviour change and behavioural insights to drive reduction in energy consumption
Monitoring and evaluation

Monitoring of upgraded properties for pre or post retrofit performance factors is not widespread. The limited monitoring that is undertaken is mainly focused on energy consumption and assessing health outcomes. This reflects the motivation for reducing fuel poverty and improving affordability for tenants.

The emphasis on health outcomes might reflect a desire from Registered Providers to use health services to underpin decisions about undertaking retrofit projects.

Where monitoring is not undertaken, the return on capital investment cannot be calculated and information that could be vital in producing a business case for future investment is not available.

Most respondents’ organisations monitor only up to 10% of their properties for pre or post retrofit performance factors.

The most monitored factor was for health outcomes at 76%.

85% of respondents stated that the main source of funding for their retrofit projects came from their companies own internal budgets.

The respondents also stated that cost was the main inhibiting factor in monitoring properties’ pre or post-retrofit performance.
The social housing sector has done more than most others to address sustainability issues in UK housing. Whilst the sector recognises that there is much more that it needs to do, there is clearly prohibiting uncertainty over priorities and resources following recent changes in Government policy.

Shape of things to come

In the face of reduced funding and direction from central Government, many Registered Providers are taking matters into their own hands. In this context, retrofit investments will need to get smarter. We found the housing industry is doing this in three ways.

1. Strategic investments

Most respondents have, or are developing strategic plans for sustainable retrofit. While this is encouraging, the current policy environment and tight finances mean that the need to achieve value for money is more pressing than ever. Respondents showed they are taking a variety of approaches to achieve value.

The questionnaire asked respondents to identify whether they were “interested but not delivering”, “not interested”, or “already delivering” against a list of ten new technologies and approaches. The highest scoring areas for “interested but not delivering” were for “Collaborating with other Registered Providers and Local Authorities to deliver community wide retrofit”, and “Working with the health sector to deliver retrofit” (each cited by 73% of respondents). In each of these cases a number of respondents identified that they were already delivering in this area.

2. Technological developments

Solar PV has clearly become an established and trusted technology in the sector. Respondents were more wary of ground and air source heat pumps, with notably lower confidence in their performance compared to more conventional measures such as replacement boilers and insulation.

The energy industry is forecasting a future move away from gas and towards the electrification of heat, but it is clear that if this is to be the case, confidence in these electric technologies needs to grow. Perhaps surprising then that monitoring and evaluation is not widespread in the industry. This may be an area that needs more attention from both Registered Providers and technology providers.

Also of interest, and with a relatively low respondent rate of “already delivering”, were “Smart grids and battery storage” and “new business models for renewable energy projects e.g. third party finance for solar”.

3. Data improvement and analysis

Data collection, management and analysis is important to enable a clear and informed business case and investment strategy for retrofit.

This will be an area that needs ever more attention in order to keep pace. While organisations such as Orbit Housing Group are using stock data analysis to good effect, almost half of respondents had medium or low confidence in their housing stock data.

As smart metering and other data points proliferate and analytical tools develop, the risks and opportunities for using effective data analysis to inform retrofit will grow.
The authors would like to thank all those who made this State of the Nation report possible, in particular the respondents from each Registered Provider.

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