

Home Energy Conservation Authority Annual Progress Report 2020





In a year where countries across the world were focused on overcoming the COVID-19 pandemic, the benefits of sustainable development and resilience have been recognised in many national recovery plans across the globe.

Within Northern Ireland, the focus of organisations in the energy supply and energy efficiency sector, including the Housing Executive, the Department for Communities, the Department for Economy, housing associations, the Utility Regulator, energy-focused social enterprises and the energy suppliers, was to maintain the effective delivery of services and to ensure that vulnerable people were supported appropriately.

We acknowledge the hard work across this sector with continuing initiatives to provide support for householders, with particular emphasis on those who are most vulnerable.

The Housing Executive's Research Department is preparing to carry out research modelling in 2021 and undertake the Northern Ireland House Condition Survey (HCS) in 2022, which will deliver an updated suite of statistics to help further assess the extent of fuel poverty and provide updated measures of energy efficiency and carbon emissions across the residential sector.

During 2019/20, the Housing Executive invested £37.5m through a wide range of programmes, including enhancing thermal efficiency, window replacement and heating replacement schemes.

Across the housing association sector, a further £5.1m was delivered through a range of energy efficiency

measures, including the fitting of new heating systems, the installation of more effective insulation and the utilisation of renewable technologies.

An essential element of our collective success in delivering improvements in energy efficiency and reductions in fuel poverty reflects effective partnership and collaborative working.

I would, therefore, like to extend my thanks to the wide range of stakeholders from across central and local government, the energy supply sector, leading energy charities and social enterprises who all support our HECA stakeholder panel, which has continued to meet regularly throughout the year.

Despite extended periods of lockdown during the past year, the Housing Executive (in partnership with seven organisations in 5 other countries) has continued to manage the delivery of the EU-funded HANDIHEAT project.

This includes oversight of two projects in rural communities in Finland and Northern Ireland that are intended to demonstrate the potential benefits of sustainable technology solutions for rural communities that are currently over-dependent on fossil fuels for their domestic heating.

This year the Housing Executive has also entered into an agreement to work with a range of partners in the GIRONA Project.



The purpose of this project is to demonstrate that household energy bills can be reduced significantly through the utilisation of renewable technologies.

This involves fitting solar photovoltaic renewable technology and battery storage equipment in Housing Executive properties in Ballysally, Coleraine.

The use of this technology is intended to help the participating households to understand their patterns of usage and, in turn, to enable them better to manage their consumption, leading to reduced energy bills.

Last year, the Northern Ireland Executive launched its 'New Decade, New Approach' document. It contains ambitions for the delivery of a Northern Ireland Climate Change Act and a New Green Deal.

Promoting and delivering improvements in energy efficiency and reducing fuel poverty remain priorities because they have such significant impacts on so many aspects of everyday life.

The new Programme for Government (PfG) was released for consultation in January 2021 and outlined the ambition of ensuring that people can "live and work sustainably" while protecting the environment and seeks to ensure that "Our economy is globally competitive, regionally balanced and carbon-neutral."

In order to achieve sustainable development and to mitigate climate change across the residential sector it is important, in the first instance, to deploy energy efficiency measures aimed at reducing energy demand in existing properties.

In parallel, there should also be a focus on the transition to low and zero carbon heating systems in the residential sector.

Equally, the Housing Executive recognises the importance of education and awareness messaging, in order to enable householders to embrace the use of renewable technologies.

By continuing to work in partnership with our existing stakeholders we can together contribute to combating climate change and work towards securing an environmentally sustainable future for all households across Northern Ireland.

Every individual effort counts and I encourage everyone to work with us to secure a better, more environmentally sustainable future.

Professor Peter Roberts, Chair Northern Ireland Housing Executive



Heating and boiler conversions

**£21.8**m

invested in **Housing** Executive homes



Double glazing installations

**£1.6m** 

invested in Housing Executive homes

ons

**5** 2,594

Affordable Warmth Scheme

# **£12.3**m

of expenditure for 2,594 private sector homes (funded by DfC and managed by the Housing Executive)



Boiler Replacement Scheme

# **£1.4**m

funded for the installation new energy efficient boilers



NI Sustainable Energy Programme (NISEP)

**£7.4**m

on energy efficient schemes to help householders implement energy saving measures to their homes



# Oil buying clubs 2.1m



Litres of home heating oil delivered to **27 Oil Buying Clubs** April 19 - March 20.

**12.8% average saving** (on a 300 litre delivery)

Boiler upgrades £5.1m

invested in **Housing** Association homes

# **2019/20 Investment**

#### **Strategic Context**

#### **New Decade New Approach**

In January 2020, before the COVID-19 pandemic began to have a global impact, the Northern Ireland Executive released its "New Decade, New Approach" document, in which the political parties recognised the need for a shared and ambitious strategic vision for the future, with the aim of improving lives across Northern Ireland.

That shared vision is also reflected in the new outcomes-based Programme for Government document which was published on 25th January 2021.

New Decade New Approach recognises the need for a co-ordinated and strategic approach within the Programme for Government to the challenges presented by climate change.

Actions and interventions will be required across a wide range of areas in order to address both the immediate and longer term impacts of climate change in a fair and just way. To this end, the Executive will:

- Review its strategies to reduce carbon emissions in light of the Paris Climate Change Accord and the climate crisis.
- Set ambitious targets and actions for a fair and just transition to a zero-carbon society via an Energy Strategy.
- Bring forward a Climate Change Act to give environmental targets a strong legal underpinning.
- Establish an Independent Environmental Protection Agency to oversee this work and ensure that targets are met.
- Support clean and inclusive growth and create jobs as part of a Green New Deal via its Economic Strategy.
- Create a plan to eliminate plastic pollution.
- Close the Renewable Heat Incentive scheme and replace it with a scheme that effectively cuts carbon emissions.

This approach is to be welcomed, particularly given the UK Government's legislative commitment to a 100% reduction in the UK's net emission of greenhouse gases by 2050, compared to the level of emissions that were recorded in 1990, via the 2008 Climate Change Act (2050 Target Amendment Order 2019) .



#### **NI Energy Strategy**

The Department for Economy issued a "Call for Evidence" regarding the production of a new NI Energy Strategy in December 2019.

This was subsequently supported by stakeholder engagement via a series of workshops between January and March 2020.

The Call for Evidence closed in April 2020 and was followed by the release of thematic e-bulletins covering a range of issues including e.g. Hydrogen, Carbon Capture; Clean Growth (Business & Industrial energy) and Transport Energy modelling.

The Department for Economy will undertake formal consultation on the Draft NI Energy Strategy from April until June 2021, with a Final Strategy to be launched in November 2021.

#### Building Regulations

Northern Ireland's Building Regulations are currently less rigorous than the comparable Regulations in England. However, a new set of Future Homes Standards have recently been the subject of an extensive consultation exercise in England.

The Draft Future Homes Standards include proposals to increase the energy efficiency requirements for newly constructed homes whereby such properties would be futureproofed through a requirement for the installation of low carbon heating systems and world-leading energy efficiency measures. It is currently anticipated that new standards could be introduced in respect of newly constructed properties in England with effect from 2025 onwards.

In Northern Ireland, the Department of Finance has noted that "subject to the usual policy development processes and appropriate consultation" it plans to bring forward a number of amendments to the Building Regulations.

As the vast majority of current residential dwellings will still be in place in 2050, enhanced Building Regulations will provide a valuable policy lever to influence energy efficiency improvements through improved retrofit standards in properties across Northern Ireland.

#### Community Planning and Local Development Plans

As a Statutory Partner, we have established energy objectives within the Community Plans and, as a Statutory Consultee in the Local Development Plan (LDP) process, we advocate a holistic approach to developing energy policies, which seeks to provide better alignment of central and local government priorities in Northern Ireland.

We believe that the Local Government Act 2014 provides key influence through local policies aimed at reducing energy consumption, improving connectivity, integrating land use and transport, and requiring all new buildings to be developed to high standards of energy efficiency.

The Housing Executive has advocated a policy within the LDP, which includes a minimum SAP rating for new buildings. (For new build schemes delivered as part of the Social Housing Development Programme, an optional Energy Efficiency Multiplier supports sustainable and energy efficient design, beyond the existing statutory minimum SAP ratings).



#### 6th Carbon Budget

In December 2020 the Committee of Climate Change announced its 6th (UK) Carbon Budget which plots a road map towards Climate Change.

It recommended that Northern Ireland should follow the 'Balanced Pathway' toward the UK's ambition of achieving Net Zero by 2050.

It also noted that Northern Ireland would need to deliver 60% of the reduction in Greenhouse Gases in the next 15 years and spend approximately £2bn to £2.5bn per year from 2030 onwards to provide compliance with the UK Net Zero target within the Climate Change Act.

#### Research into the Impact of Retrofitting solutions

The Housing Executive recently commissioned research from the Building Research Establishment (BRE) to investigate the potential cost of providing retrofit solutions, in the context of the drive to de-carbonise domestic heating systems and deliver energy efficiency improvements and cost savings for domestic energy consumers.

The research considered the retrofit costs, household energy savings and carbon savings for upgrading all of Northern Ireland's housing, in both the public and private sector to a future level of energy efficiency.

It is likely this report may inform the debate on the road map to achieve compliance with Net Zero across the building sector as we move toward 2050. The findings of this research are summarised in Section A of this year's Progress Report.



# How to save energy

**Measureable outcomes - baseline, actions and progress** 



#### Advice

Improved access to advice, improved connectivity with residential customers

#### Reduce

Implement energy efficient schemes within social and private housing sectors



#### Protect

Increase electricity consumption from renewable resources, research and install innovative measures



#### Measure

Energy mix, reduce oil dependency, gas to the west



#### **Measuring progress across all dwellings**



#### **SAP** ratings

The Northern Ireland House Condition Survey (HCS), is the primary data source for assessing progress of energy efficiency across the NI residential sector.

As noted, the Standard Assessment Procedure (SAP) is the Government's standard method of rating the energy efficiency of a dwelling.

The overall SAP rating for Northern Ireland in 2016 was 65.83, using the latest SAP model.<sup>1</sup>

Social housing had the highest SAP Mean rating (72.63) and vacant dwellings had the lowest SAP rating (51.78).

During the 5-year period from 2011 to 2016 there was total investment of £300m in the provision of energy efficiency measures, which contributed significantly to achieving higher SAP ratings.<sup>2</sup>

#### Mean SAP and Tenure (2016 HCS)

1. The SAP model was modified between 2011 and 2016 in order to improve the accuracy of energy efficiency ratings. 2. 2016 Northern Ireland Housing Executive HCS.





#### **Domestic Heating**

At present, Northern Ireland has the highest level of dependency on high-carbon fossil-fuel across the UK - with 68% of households dependent upon home heating oil.

The natural gas network, which is largely concentrated in eastern parts of Northern Ireland, is being expanded to the west of the province under the auspices of "Gas to the West" via licence arrangements agreed in 2015. Despite this expansion process, a significant number of isolated rural communities the west of the province, remain unable to access the gas network.

For this reason, as part the EU-funded HANDIHEAT project the Housing Executive is carrying out a pilot demonstration project to explore the potential of hybrid electricity generation and storage solutions for six homes in Lisnaskea, Co Fermanagh.

This pilot will evaluate a combination of hybrid installations in these properties, including oil / electric boilers; air source heat pumps; solar photovoltaic panels; and battery storage systems as well as energy efficient insulation measures. Data from the pilot will be analysed to assess the suitability of low carbon and hybrid options as alternatives to oil-fired boilers.

This will help to inform the search for alternative sources of energy to power domestic heating and counteract the current high level of fossil fuel consumption, particularly in rural settlements that do not currently have access to alternative sources of low carbon heating.

The installation of Gas central heating systems, however, currently remains the preferred option (subject to network availability) for the Housing Executive's domestic heating replacement schemes, as it provides security of supply from regulated energy suppliers, with lower carbon emissions than home heating oil equivalents.

This policy is now under review in the context of the UK Climate Change Act 2008 (2050 Target Amendment: Net Zero) which includes a long term ambition to decarbonise domestic heating across the UK.

One possible long-term solution is the use of green hydrogen as a substitute to natural gas within the existing gas network, and the Housing Executive will continue to closely monitor independent data from on-going trials (across the UK) to assess the efficiencies and cost effectiveness of this option.

With the current focus on decarbonising domestic heating systems, the cost of providing alternative, low carbon replacement heating systems and of subsequently providing additional energy efficiency measures remains a key challenge both for householders and landlords.

With existing fossil-fuel based heating systems typically costing less to buy and install than zero carbon alternatives, there will need to be an emphasis on policy changes which facilitate the introduction of funding incentives and the development of awareness programmes to promote behavioural changes. Such programmes should alert householders to the effects of climate change and provide better information on how to reduce domestic energy consumption.

#### **Home Insulation**

The proportion of housing stock with full cavity wall insulation is 65%, based on the 2016 HCS; this figure has remained static since the findings of 2011 HCS.

As the 2016 HCS noted, 'this was expected, as there hasn't been the same level of investment in cavity wall insulation as there has been in loft insulation, double glazing or the replacement of solid fuel heating.'

As part of the 2016 HCS, an examination of the extent of cavity wall insulation (by tenure), provided the following results.





#### Energy Consumption and Carbon Dioxide (CO2) Emissions within Northern Ireland's Housing Stock

The Housing Executive commissioned the Building Research Establishment (BRE), to interrogate the 2016 HCS data to produce an updated assessment of progress against the original HECA baseline statistics identified in 1996.<sup>1</sup>

#### **Key findings**

In the 2016 HCS, the improvement in energy efficiency, since 1996, was 29.1% from the occupied pre-1996 housing stock. This was measured, in the 2011 HCS, as a 22.5% improvement in energy efficiency and the latest data demonstrates continued progress in this key measurement.<sup>2</sup>

#### Methodology

The analysis provides the CO<sub>2</sub> emissions from dwellings in Northern Ireland from the following activities:

- Water heating
- Lights and appliance use
- Cooking

#### **Energy Consumption Results**

The consumption and emissions results are also presented for space and water heating only, thereby excluding lights, appliance use and cooking. This approach can be useful when analysing the effect of improvements to the building fabric and heating systems.

It is clear that the general trend since 1996 has been towards a reduction in energy consumption. This is consistent with improvements to dwellings' fabric energy efficiency (in particular cavity wall insulation) and heating system improvements (condensing central heating systems replacing older, less efficient systems). The decrease in energy consumption over the latest five year period, 2011 to 2016, for the occupied stock only, is similar to the previous 5-year period (2006 to 2011).

The total  $CO_2$  emissions for all dwelling reduced by 30% from the 1996 baseline (based on 2016 data)<sup>3</sup>.

Energy consumption in pre-1996 dwellings (Terajoules/year), 1996-2016



1. BRE is the world's leading building science centres, and provides training, publications, advice and digital tools for the construction industry.

2. Based on measurement of modelled standardised consumption by BRE.

3. https://www.nihe.gov.uk/Documents/Research/HCS-2016-Additional-Reports/

Carbon-dioxide-emissions-NI-housing-2016.aspx

#### **Carbon Dioxide Emissions Results**

The emissions are constructed by taking the consumption and then applying associated emissions factors (from the SAP specification) for each fuel being used in the dwelling.<sup>1</sup>

The graph opposite shows the total  $CO_2$  emissions for all dwellings reduced by 30% from the 1996 baseline (based on 2016 data).<sup>2</sup>

This will be dominated by the space and water heating fuel in use in each dwelling, typically oil, gas or electricity. Emissions from lights and appliance use are calculated using the carbon dioxide factor for electricity.

The results presented here use different emissions factors for different years to reflect the fact that the carbon mix of electricity generation has changed over the years as has the carbon intensity of other fuels, and the understanding of emissions associated with each fuel.

CO<sub>2</sub> emissions exhibit a similar pattern of reduction to energy consumption apart from in 2009<sup>3</sup>.



1. The  $CO_2$  emissions are taken from the pre-1996 dwelling stock.

2. In 2009, the modelling switched to using the SAP 2009 carbon emissions factors which incorporated factors for electricity which are significantly higher than in the SAP 2005 specification.

*3.* In 2009, the modelling switched to using the SAP 2009 carbon emissions factors which incorporated factors for electricity which are significantly higher than in the SAP 2005 specification.

#### Carbon dioxide emissions from pre-1996 dwellings (Kilotonnes/year), 1996-2016



Cost of carbon savings in Northern Ireland's housing stock - Retrofitting energy efficiency measures to achieve Energy Efficiency Rating Bands C and B: modelled using data from the NIHCS 2016

This report was commissioned by the Housing Executive to estimate the potential capital cost, change in household energy bills and carbon savings of retrofitting all Northern Ireland's housing stock to improved levels of thermal efficiency in the medium and long term, and to inform the debate around decarbonisation of the NI housing sector. This report is summarised in this section.

Energy efficiency is central to all energy transition pathways to achieve net zero, as reduced energy demand decreases the need for energy network upgrades and ensures energy bills are affordable.

DfE recently published a report in the area, 'Research into the Future of Energy Efficiency Policy in Northern Ireland', which noted:

"Our modelling of future policies indicates that a dramatic change in policy extent and funding levels is required for NI to put building energy performance in line with the UK's net zero carbon emissions commitment. The modelling indicates that a peak of retrofit measures for up to 30,000 buildings per annum is the minimum necessary to align with the UK's 2030 energy efficiency target. In order to align with 2050 net zero commitments, it is estimated that policies would need to drive an annual peak of retrofits for over 50,000 buildings within the next decade. By comparison, current energy efficiency programmes in NI deliver measures for approximately 16,500 buildings per year, indicating that a doubling or trebling is needed."

With the impending requirement to significantly increase the level of energy efficiency measures this research will detail the probable future capital costs, household energy bills and carbon savings from future retrofit scenarios.

The main findings of this report follow the Energy Performance Certificate (EPC) improvement methodology set out in SAP methodology. Additional analysis has also been conducted to quantify the cost of improving dwellings through some alternative packages of improvement measures.

These additional improvement scenarios have been specified by the Northern Ireland Housing Executive and encompass current thinking and possible policy considerations around the likely routes to improving the NI housing stock.

#### **Summary of Key Findings**

The total cost to improve the approximately 390,000 eligible dwellings in Northern Ireland to at least a SAP band C was £2.4 billion, with a mean cost of £6,200 per dwelling.

- The overall impact of improving dwellings in Northern Ireland to SAP Band C would be to provide mean energy cost savings of £500/year, mean  $CO_2$  savings of 3.2 tonnes/year and a mean SAP rating increase of 14.
- 3 The total cost to improve the approximately 586,000 eligible dwellings in Northern Ireland to at least an SAP Band B was £9.2 billion (based on SAP methodology), with a mean cost of £15,600 per dwelling.
  - The overall impact of improving dwellings in Northern Ireland to SAP Band B would be to provide mean energy cost savings of £700/year, mean  $CO_2$  savings of 3.7 tonnes/year and a mean SAP rating increase of 18.

Generally, traditional improvement measures, which focus on installing fabric insulation and upgrading heating systems, were sufficient to improve dwellings to an energy efficiency rating (EER) Standard Assessment Procedure (SAP) Band C.

To reach the target Band B threshold however, further measures were required in most cases.

Specifically, the installation of photovoltaic (PV) panels was essential in improving a significant proportion of the stock to a Band B.

#### Impact to Improve Dwellings to Energy Efficiency Rating (SAP) Band C

The total cost to improve the approximately 390,000 eligible dwellings in Northern Ireland to at least a Band C was £2.4 billion, with a mean cost of £6,200 per dwelling.

Figure 1 shows the percentage of dwellings that have reached the EER Band C threshold at each improvement measure stage, as well as the cumulative cost of implementing these measures. (The improvement measures are detailed in the report, which is linked at the end of this section).

Figure 1: Percentage of dwellings improved to EER Band C with each improvement, and the associated cumulative cost.



Here, the improvement measures are broken down into three types; low cost, high cost and further measures. If only low-cost measures were implemented, 35% of dwellings with an EER Band D or lower would be improved, with an associated cost of around £75.6 million. This accounts for 3% of the total cost to improve dwellings to an EER Band C. Implementing both low and high cost measures would improve 81% of dwellings with an EER Band D or lower to the threshold, costing approximately £1 billion, which is 44% of the total cost. The further measures are required to improve the remaining 19% of dwellings with an EER of D or lower, but contribute 56% of the total cost.

Table 1 shows the average annual energy cost and  $CO_2$  savings for dwellings with an EER Band D or lower. It also shows the average SAP rating increase for these dwellings following the installation of eligible improvement measures. Dwellings with a pre improvement EER Band F and G have the largest mean energy cost savings, and the largest mean CO<sub>2</sub> savings by a considerable amount.

Table 1: The mean energy cost savings mean  $CO_2$  savings and mean SAP rating increase of dwellings by pre-improvement EER Band.

Pre-improvement EER Band	Mean Energy Cost Savings (£/yr)	Means CO <sub>2</sub> Savings (kg/yr)	Mean SAP rating increase
D	300	1,600	8
E	1,000	5,800	24
F & G	2,000	12,200	47
All	500	3,200	14

When analysing breakdown by tenure, 72% of dwellings with an EER Band D or lower were owner occupied, with a total cost to improve these dwelling to an EER Band C of £1.9 billion. These dwellings also had the highest mean installation cost of £6,600. Table 2 outlines the total and mean cost of improving dwellings to at least a Band C by tenure.

Table 2: The total and mean cost of improving dwellings to an EER Band C by tenure.

Tenure	No of Dwelling	% of Dwelling	Total Cost (£b)	Mean Cost (£)
Owner Occupier	281,000	72	1.9	6,600
Private Rented	83,00	21	0.5	5,900
Social Rented	26,000	7	0.1	2,900

#### Impact to Improve Dwellings to Energy Efficiency Rating (SAP) Band B

The same method was used to analyse the cost of improving dwellings to an EER Band B (SAP rating of 80.5 or higher). As with the Band C modelling, improvement measures were applied cumulatively.

The total cost to improve the approximately 586,000 eligible dwellings in Northern Ireland to at least an EER Band B was  $\pm 9.2$  billion, with a mean cost of  $\pm 15,600$  per dwelling.

Figure 2 shows the cumulative number and installation cost of the dwellings that have reached the EER Band B threshold after each improvement measure.

Figure 2: Percentage of dwellings improved to EER Band B with each improvement, and the associated cumulative cost.



Again, the improvement measures are broken down into three types; low cost, high cost and further measures. If only low-cost measures were implemented, just 2% of dwellings with an EER Band C or lower would be improved, with an associated cost of around £2 million. Installing both low and high cost measures would improve just 7% of dwellings with an EER Band C or lower to the threshold, costing approximately £126 million. Further measures are required to improve the remaining 93% of dwellings with an EER Band C or lower, and account for 99% of the total cost.

The traditional improvement measures which focus on fabric insulation and heating upgrades are not enough to improve most of the stock to a Band B. It is not until renewable technologies, in the forms of PV are installed (measure U), that a significant proportion of dwellings reach the target Band B threshold.

Table 3 shows the mean energy cost savings and the average CO2 savings per year that can be achieved by improving dwellings to an EER Band B. It also includes the mean SAP rating increase for these dwellings following improvement measures. As expected, mean energy cost savings, CO<sub>2</sub> savings and energy efficiency ratings are highest in the lower pre-improvement EER Bands.

Table 3: The mean energy cost savings, mean CO<sub>2</sub> savings and mean SAP rating increase of dwellings with a pre improvement rating of below a Band B

Pre-improvement EER Band	Mean Energy Cost Savings (£/yr)	Means CO <sub>2</sub> Savings (kg/yr)	Mean SAP rating increase
С	400	1,900	10
D	800	4,200	22
E	1,400	7,900	37
F & G	2,300	13,300	58
All	700	3,700	18

Just over two thirds of dwellings (67%) with an EER Band C or lower were owner occupied. These had a total improvement cost of £6.4 billion and a mean cost of £16,300. Table 4 shows the numbers and costs of improving dwellings to at least a Band B for private rented and social rented dwellings.

Table 4: The total and mean cost of improving dwellings to an EER Band B by tenure.

Tenure	No of Dwelling	% of Dwelling	Total Cost (£b)	Mean Cost (£)
Owner Occupier	393,000	67	6.4	16,300
Private Rented	112,000	19	1.7	15,700
Social Rented	82,000	4	1	12,300

#### Impact to Improve Dwellings to Energy Efficiency SAP Band C and Band B using Alternative Scenarios for NI

The above findings follow the improvement methodology detailed in SAP methodology, which represents one pathway for improving dwellings to a Band C and above. In reality, it may be that a package of measures which deviates from the EPC methodology is most appropriate for improving the energy efficiency of dwellings. Therefore, the Housing Executive specified additional scenarios for analysis, to determine the cost of improving dwellings under alternative improvement pathways. These scenarios have been created to reflect the existing housing landscape across NI and current thinking around the most feasible routes to improving the NI housing stock in the short- and medium- term. Two scenarios have been specified by the Housing Executive (listed in Appendix B of this Report, linked at the end of this section), each consisting of a package of improvement measures to improve dwellings to EER Band C and Band B. This creates 4 packages of measures in total:

- Measures likely to be installed in the short-term to improve dwellings to EER Band C
- Measures likely to be installed in the short-term to improve dwellings to EER Band B
- Measures likely to be installed in the medium-term to improve dwellings to EER Band C
- Measures likely to be installed in the medium-term to improve dwellings to EER Band B

Within the short-term and medium-term scenarios, the same improvement measures are specified in both the Band C and Band B packages, with the addition of PV being required to improve dwellings to a Band B. This assumption matches the findings of the EPC modelling, which showed that PV was required in a significant proportion of dwellings to achieve an EER of Band B or higher. It is assumed that the measures specified under each scenario are sufficient to improve each dwelling to the desired EER Band. In some cases, dwellings may already have one or more of the energy efficiency measures specified within each improvement package, in which case they will only be flagged to receive the remaining measures that they are eligible for.

# **Cost of improvement under alternative scenarios**

For each scenario, the number of dwellings applicable to receive at least one of the measures in the improvement package has been identified, and a cost to install applicable measures calculated. The eligibility criteria set out in Appendix B (of published report) have been used to determine whether a household is eligible to receive each measure specified in the package and a range of installation costs have been provided, based on the notional costings used for the EPC modelling methodology.

Table 5 shows the total number of dwellings eligible to receive at least one measure under each improvement scenario, alongside the mean and total cost of installation. Under both the short-term and medium-term scenarios, 100% of dwellings below a Band C were eligible to receive at least one of the measures specified. Greater than 99% of dwellings were eligible to receive at least one of the measures specified to get to Band B under the short-term scenario, and 100% under the medium-term (for both scenarios, the number of dwellings is the same when rounded to 3 significant figures).

Table 5: Mean and total cost of installing one or more measures under each scenario.

Senario	No of dwellings eligble ('000's)	Mean cost of installation (£)	Total cost of installation (£b)
Band C Short Term	390	4,500 - 9,000	1.7 - 3.5
Band B Short Term	740	8,300 - 14,400	6.2 - 10.7
Band C Medium Term	390	4,900 - 13,400	1.9 - 5.2
Band B Medium Term	740	8,600 - 17,400	6.4 - 12.9

Installing the measures specified in the short-term Band C scenario to dwellings with an EER Band D or below would cost a total of between £1.7 and 3.5 billion, with a mean installation cost of between £4,500 and £9,000. This compares with a total installation cost of between £1.9 and 5.2 billion for the medium-term scenario and a mean installation cost of between £4,900 and £13,400.

The higher cost to improve dwellings to a Band C under the medium-term scenario is due to the inclusion of heat pumps as a heating upgrade measure (which have higher notional costs than the equivalent oil boilers installed under the short-term scenario), and the addition of low energy lighting as a measure in the improvement package.

Installing the measures specified in shortterm Band B scenario to dwellings with an EER Band C or below would cost a total of between £6.2 and 10.7 billion, with a mean installation cost of between £8,300 and £14,400. This compares with a total installation cost of between £6.4 and 12.9 billion for the medium-term scenario and a mean installation cost of between £8,600 and £17,400.

The higher costs to get to Band B are associated with the addition of PV as an improvement measure, as well as an additional number of dwellings being improved (all those with an EER Band C). Again, the medium-term scenario results in higher costs than the short-term scenario, due to the inclusion of heat pumps and low energy lighting.

#### **Estimated energy and CO<sub>2</sub> savings**

The main findings have already calculated the SAP based running cost and CO<sub>2</sub> savings associated with improving each dwelling to a Band C and/or Band B, and it is assumed that the same savings would be achievable through the alternative improvement scenarios. These savings should be considered estimates, as they are based on the improvement pathways assumed under the EPC modelling methodology.

Energy cost and CO<sub>2</sub> savings associated with the alternative scenario packages may differ, especially where the scenarios specify installing a heating system which uses a different fuel to that recommended through an EPC assessment (such as electric heat pumps).

It should be noted that a proportion of cases did not reach the threshold of an EER Band C and/or Band B under the EPC modelling methodology, and therefore energy cost and CO<sub>2</sub> savings for these dwellings are not able to be attributed under the alternative scenarios. It may be possible for these dwellings to be improved through the installation of measures not included under the standard EPC methodology (such as those suggested under the improvement packages), but the associated savings are unknown for this work.

Table 6 shows the estimated energy cost and  $CO_2$  savings achievable under each scenario, as modelled through the EPC improvement modelling, for dwellings identified as being able to reach the target EER Band. The EPC modelling found that > 99% of dwellings with an EER Band D or below were able to be improved to a Band C through the EPC methodology, and 79% of dwellings with a Band C or below were able to be improved to a Band B.

Table 6: Mean and total estimated energy and  $CO_2$  savings under each scenario for dwellings able to reach the target Band under EPC modelling.

Scenario (short and medium term)	Mean est. energy cost savings (£)	Mean est. CO <sub>2</sub> savings (tonnes)	Total est. energy cost savings (£m)	Total est.CO <sub>2</sub> savings (million tonnes)
Band C	540	3.2	212	1.2
Band B	700	3.8	409	2.2

Improving dwellings to a Band C under the short- and medium-term scenarios is estimated to achieve a mean energy cost saving of £540, a mean  $CO_2$  saving of 3.2 tonnes, a total energy cost saving of £212 million, and a total  $CO_2$  saving of 1.2 million tonnes.

Improving the 79% of dwellings able to reach a Band B under the short- and medium-term scenarios, is estimated to achieve a mean energy cost saving of £700, a mean  $CO_2$  saving of 3.8 tonnes, a total energy cost saving of £409 million and a total  $CO_2$  saving of 2.2 million tonnes.

https://www.nihe.gov.uk/Documents/Research/HCS-2016-Additional-Reports/Cost-of-carbon-savings-in-Northern-Ireland-housing.aspx

#### **NI Energy Advice Service**

Since April 2020, Northern Ireland householders from all tenures have been able to access energy efficiency advice following the launch of the Housing Executive's new NI Energy Advice Service.

The Energy Advice Service is NI's only one stop shop for information on energy efficiency, grant availability, cost savings and renewables.

The team signpost to available energy grants - the Northern Ireland Sustainable Energy Programme (NISEP), the Housing Executive's Boiler Replacement Scheme, plus a targeted Affordable Warmth Scheme. This advice offers vital help via energy cost saving information to vulnerable householders, older people and those on low incomes.

Local householders can access energy-saving advice in a number of ways i.e.

- by calling Freephone 0800 111 4455
- by using a GET-IN-TOUCH e-form on the Housing Executive's website
- by contacting our team of experienced Energy Advisors via e-mail at Nlenergyadvice@nihe.gov.uk



Launch Event via Interactive Webinar from the Titanic Centre in August 2020

The delivery of this service is an important element in achieving the Department for Communities (DfC) and the Housing Executive's key objective of tackling fuel poverty.

As the Home Energy Conservation Authority for Northern Ireland the Housing Executive promotes energy efficiency awareness and believes households should get the right energy advice that suits their specific circumstances; the Housing Executive will signpost any relevant queries to the available energy efficient grants providers. Siobhan McCauley, the Housing Executive's Director of Regional Services, explains why the organisation now funds and operates the Service:

"As the Home Energy Conservation Authority for Northern Ireland we have a statutory duty to promote energy efficiency and advice to all householders. With the refreshed Northern Ireland Energy Advice Service we want to ensure all householders are able to have easy accessible free impartial advice that will help people save money on their energy bills and reduce their carbon footprint.

The Housing Executive provides a wide range of housing support to both public and private sector householders, and from April 2020 we have been successfully delivering the Northern Ireland Energy Advice Service. This service is managed and operated by the Housing Executive and funded by Department for Communities (DfC)"

Statistics for customer enquiries to the NI Energy Advice Service regarding home heating, insulation, renewables for heating and home energy.



customer enquiries facilitated in the first 10 months of operation (April 2020 - Jan 2021)



1,766

calls came from owner occupiers



415

callers reported their boiler as broken



|--|

callers used home heating oil as their main fuel source



1,458

callers sought assistance in respect of high fuel costs

#### Schools' Energy **Efficiency Awareness Programme (SEEAP)**

The Housing Executive launched a refreshed NI Energy Advice Service in April 2020. A further component of this service involves the previously outsourced Schools' Energy Efficiency Awareness Programme (SEEAP).

SEEAP encourages pupils' awareness of energy use, and under 'The World Around Us', an Area of Learning in the Primary School curriculum, seeks to encourage action through informative presentations, activities and learning resources.

We hope to align our learning objectives to support the future success of Science, Technology, Engineering and Mathematics (STEM) across the education sector.

The Housing Executive has been working during recent months to forge a collaborative working relationship with Keep Northern Ireland Beautiful.

This has led to a NI-wide environmental awareness programme network covering 11 major environmental topics - supported by DEARA and partnering with Translink; Mars Wrigley; Granville Park; Trocaire; local Councils, and a host of associated sponsors and support organisations.

The Housing Executive, through grant-aid to Keep NI Beautiful, will sponsor the 'Energy' topic for all NI Schools as part of Eco-Schools programme.



Eco-Schools and SEEAP reflect the aspirations of the Sustainable Development Goals (SDG), and in turn, are aligned to the ambitions regarding energy efficiency outlined in the new Programme for Government (launched in January 2021).

In the past six months, our collective attention has been waylaid by pandemic related challenges. This second half of the school year can only be better.

We will hopefully see a renewed focus in schools on tackling the climate.

Increasing the focus on energy efficiency awareness is a great way to re-start. SSEAP in conjunction with Eco-schools will endeavour to make environmental awareness and action an intrinsic and enjoyable part of every child's learning experience.

Looking for a fun and engaging way to supplement instruction on energy and the environment, we are developing a Comic Strip Energy

THE REAL SS PROGRAMME



Hero presentation to deliver to all P7 and SCHOOLS' ENERGY FFFICIENCY Year 8 classrooms

To encourage involvement in the new Programme, school children will be invited to update our presentation, to fill in the 'graphic gaps', to design their own energy Superhero!



#### **National Energy Action (NEA)**

NEA is a charity working to end fuel poverty across the UK. Supported by Housing Executive funding, it also provides essential energy efficiency training and awareness outreach in Northern Ireland to householders and community groups. It raises public awareness through an extensive range of activities, including accredited training courses which cover fuel poverty, fuel debt, affordable warmth and delivering practical energy advice.

#### **Fuel Poverty and Health Certified Training**

In response to the pandemic, NEA utilised virtual technology during 2020 as a means of delivering training programmes in respect of Fuel Poverty and Health awareness. This training examines the causes and impacts of fuel poverty with a focus on health issues and solutions. It aims to help delegates identify those likely to be at risk from fuel poverty and to signpost them towards appropriate assistance.

Webinars are delivered live by expert tutors to small groups to ensure a good level of interaction and support for learners.

The webinars are designed for anyone wanting to learn more about fuel poverty, its causes and links with physical and mental wellbeing.



#### **Typical webinar Objectives & Content**

Objectives:

- Explain causes of fuel poverty
- Identify health impacts of fuel poverty
- Explain causes of and remedies for condensation dampness
- Identify some of the assistance available to those at risk from fuel poverty

#### Content:

- Definition of fuel poverty in Northern Ireland and the causes of fuel poverty
- How to identify those at risk of fuel poverty using risk factors and triggers
- The health impacts of fuel poverty and damp homes
- Heat loss within the home
- The causes of condensation dampness/ mould and remedial actions that can be taken
- Assistance and sources of advice available to those struggling to heat their home adequately including Grants and Schemes available in Northern Ireland.



#### **Fuel Poverty Awareness Day** 27 November 2020

During 2020, the Housing Executive continued to support our HECA partner National Energy Action, by using our social media platforms to promote the vital message about Fuel Poverty Awareness.

Staff from the Housing Executive's Sustainable Development Unit took part in the online video campaign to pledge the Housing Executive's support for Fuel Poverty Awareness Day 2020.

"A Key objective for the Housing Executive is to reduce Fuel Poverty in line with the DfC Fuel Poverty Strategy. Reducing Fuel Poverty

through improved innovation and pilot schemes is vital to the Housing Executive to better inform them on Energy Efficiency and low carbon heating".



#### **HECA: Energy Efficiency Promotional Events**

#### **Energy Saving Week** 1-5 February 2021



This annual event, now in its 20th year, brings together the Energy Saving Trust and partner HECA Panel organisations, in a drive to help as many households as possible to save energy, reduce their bills and limit the impact of energy use on the environment.

During last years' event, in collaboration with Power NI, Energy Saving Trust held a householder competition, with the prize winner (pictured) receiving a smart heating control package for their home.

Due to the current restrictions, our partner HECA panel organisations utilised social media platforms to continue to raise awareness of the importance of energy efficiency at home to reduce carbon emissions and make savings on energy bills.

#### **Love Your Home**



Last year, The Housing Executive, alongside over 175 exhibitors providing products, advice, ideas and inspiration for the home, offered energy advice at the Love Your Home Event.

This year, due to the pandemic, the Housing Executive instead took the opportunity to advertise in the Love Your Home magazine that was distributed to over 58,000 homes across Northern Ireland.

Next year's show has been scheduled for November 2021 and we are looking forward to yet another successful collaboration with our HECA panel members.

#### **Oil Buying Club Awareness Day 4 December 2020**



The Housing Executive Oil Buying Club is now open to new members and is free to join.

Throughout the day, in conjunction with some of our HECA Panel members and other Agencies including the Northern Ireland Youth Forum, the Housing Executive utilised their social media platforms to promote the Oil Buying Club service.

Sustainable Development Unit staff have also recently promoted the Oil Buying Club service in conjunction with Supporting Communities NI at the recent Central Housing Forum in November 2020.

More information on joining your local Oil Buying Club or forming your own can be found on the Housing Executive's website.



# Reducing fuel poverty



#### % In Fuel Poverty

(10% definition) against gross income



#### **Analysis of Fuel Poverty Data**

Northern Ireland has around 160,000 fuel poor households. This represents an average fuel poverty rate of 22%. A key driver to deliver energy efficiency within refurbishment of housing in Northern Ireland is the need to help reduce fuel poverty.

The 2016 HCS, reports the two different methods of measuring fuel poverty, namely:

- 10% Definition, used in previous HCS and referenced in the DfC Fuel Poverty Strategy.
- Low Income High Cost (LIHC) method, used to measure Fuel Poverty in England.

#### **10% Definition**

This methodology (which is used in NI, Scotland and Wales) requires the householder to maintain a satisfactory level of heating (21°C for the living area and 18°C for other occupied rooms) and the householder is required to spend in excess of 10% of its household income on all heating and electric bills.

The three factors which determine fuel poverty model within the 10% definition are:

- Fuel prices
- Energy consumption (based on energy efficiency)
- Household income

#### **Households in Fuel Poverty**

(10% definition)\* Estimated figures from 2016 HCS model



#### **Analysis using the 10% definition**

#### a. General Findings

The 2016 HCS, estimated that approximately 22% (160,000 households) were living in fuel poverty. This represented a significant improvement compared to the 2011 HCS figures.

The reduction can be attributed to a drop in home heating oil prices during the survey period in 2016, improved energy efficiency of houses and a moderate increase in incomes.

- (i) Fuel Prices: Fuel costs consider both the heating and electric costs. Average household fuel costs in 2006 were £1,400, rising to £1,700 in 2011 and £1,500 in 2016. The most volatile issue is the erratic nature of the unregulated energy supply of home heating oil which increased by 1.81 pence per kWh between 2001 and 2011, then decreased by 0.01 pence per kWh between 2011 and 2016.<sup>1</sup> (The oil price used in the fuel poverty methodology is based on a three year average).
- (ii) Energy Efficiency: The overall SAP rating for Northern Ireland in 2016 using the latest SAP model (version 9.93 - published in November 2017) was 65.83 rising to 66.32 for occupied dwellings.
- (iii) Income: Average household income increased from £20,500 in 2011 to £23,800 in 2016, a 16% increase.

The Housing Executive commissioned BRE to undertake a further evaluation of information relating to fuel prices/the installation of Energy Efficiency measures/and household income, in 2018. This evaluation concluded there had been a further reduction in the number of households living in fuel poverty, to 18% (131,000 households).

#### b. Age of Household

There is clear evidence those households where the household reference person (HRP) is over 75 are more likely to be living in fuel poverty. Households with children were least likely to be living in fuel poverty.

#### c. Employment of Household

The largest group of fuel poor is where the HRP is unemployed and the lowest rate of fuel poor households is where the HRP is working.

Households in Fuel Poverty (10% definition) by Employment



#### d. Household Income

There is a clear correlation between household income and fuel poverty, which is reinforced with 55% of households with incomes up to £10,399 being fuel poor.

#### e. Rural Fuel Poverty

As with the 2011 HCS, rural councils have the highest levels of fuel poverty. Based on the 2016 HCS the highest rates are in Mid Ulster (32%) and Derry & Strabane (31%). The lowest rate is in Lisburn & Castlereagh (13%).

Low Income High Costs is a dual indicator in that it measures not only the extent of the problem (how many households are in fuel poverty) but also the depth of the problem (how badly affected each fuel poor household is).

The depth of fuel poverty is calculated by taking account of the fuel poverty gap. This is a measure, of the additional fuel costs (in ££s) faced by fuel poor households, to meet the non-fuel poor household threshold. (Department for BEIS 2017, p6).

Unlike the 10% fuel poverty definition measure, the LIHC is a relative measure as it compares households to the national median modelled notional fuel bill and household income. (HCS 2016, p63).

Overall, findings from the 2016 HCS show that 7% of households were in fuel poverty under the LIHC definition. This compares with 11% in England (2015).

In 2016, the average fuel poverty gap for all Northern Ireland households (the amount needed to meet the fuel poverty threshold or what is needed to be added to income to afford fuel bills) was estimated at £436. This compares to £353 in England in 2015.

This indicates that while the extent of fuel poverty under LIHC is less in NI compared to England (7% compared to 11%), the depth or severity is greater than in England.

#### **Fuel Poverty Ready Reckoner**

The Housing Executive recognises the need to gather fuel poverty data on a more frequent basis, rather than at the HCS 5-year cycle and, in 2018 published a Ready Reckoner to estimate the levels of fuel poverty based on the previous HCS (2016). This FP reckoner is available to the public - in raw form.

This provides fuel poverty figures based on variances in fuel prices, which is the most changeable factor of fuel poverty between the cycles of HCS.





#### **Grants for Owners and Private Rented Tenants**

#### Affordable Warmth Scheme

The Affordable Warmth Scheme was introduced in September 2014. It replaced the Department for Communities' (DfC) previous Programme, the Warm Homes Scheme. The replacement Scheme is also funded by the DfC and is the Domestic Energy Efficiency Improvement Programme for vulnerable low income households. The Affordable Warmth Scheme is a central element in the NI Executive's Fuel Poverty Strategy.

The Housing Executive's Private Sector Improvement Services (PSIS) unit is active in the promotion of energy efficiency in its role as administrator of the Affordable Warmth Scheme, on behalf of DfC.

Affordable Warmth is designed to help reduce the effects of fuel poverty in the private sector, offering a range of measures for households with an annual income of less than £20,000. The Housing Executive works with Department for Communities, local Councils and the Ulster University, to ensure that assistance is targeted in areas where fuel poverty is prevalent. In 2019/20, The Affordable Warmth Scheme facilitated improvements in 2,594 homes at a cost of approximately £12.3m.

This in turn involved the installation of 4.635 measures in these properties, as shown below:

1.163

 $\square \square$ 



#### expenditure via the Boiler **Replacement Scheme**

#### **Boiler Replacement Scheme**

The Boiler Replacement Scheme is for owner occupiers whose annual total gross income is less than £40,000 and is designed to provide assistance to help with the cost of replacing outdated oil or gas boilers. In order to be eligible for replacement, the current boilers must be at least 15 years old. A grant of up to £1,000 is available to assist with the cost of installing new boilers and controls.

Householders may also wish to convert from oil to gas or to a wood pellet boiler.

In 2019/20, a total of 2,161 boilers were installed at a cost of £1.4m







#### **Proportion of gas installations by Council Area** via the Boiler Replacement Scheme 2019/20



#### Energy Efficiency refurbishment across the Housing Association movement

During 2019/20, the Housing Association movement invested over £5.1m installing the following energy efficiency measures in their properties:



230 loft insulation and draught proofing measures





Northern Ireland Sustainable Energy Programme

#### **NI Sustainable Energy Programme (NISEP)**

The NI Sustainable Energy Programme (NISEP) is a customer funded Programme, which provides energy efficiency measures to home owners and private tenants. The NISEP, which runs on a year by year financial basis, has been successful in targeting homes with no heating or inefficient heating systems in addition to installing energy saving measures in homes including energy-efficient boilers, heating controls, loft insulation and cavity wall insulation.

NISEP made £7.4 million of means-tested investment available for energy efficiency schemes in 2019/20. Eligibility is based on income bands depending on individual circumstances. This funding was given to both private and social housing sectors to provide energy efficiency measures.

The Utility Regulator has announced that the current Programme is now open until March 2022. The NISEP funds come from a levy on electricity bills paid by both Domestic and Commercial customers throughout Northern Ireland.

The Energy Saving Trust NI is the Programme Administrator of NISEP on behalf of Northern Ireland's Utility Regulator, and schemes are delivered by a range of organisations across NI. Domestic measures installed via NISEP during 2018/19:





213

NISEP 2019/20 Audit is still underway - the Audit & Annual report have not been completed yet - figures subject to change

#### **Social Housing Development Programme**

The Social Housing Development Programme delivered 1,682 completed homes in 2018/19 (against a target of 1,450). 75% of these completions (1,259) were newly constructed units. New build homes are constructed by housing associations in compliance with current Building Regulations, which produce an average SAP rating of approximately 83 (Band B). This level of SAP rating is a contributing factor for the higher mean SAP of 72.63 for social housing in comparison to the mean SAP of 65.11 across all tenures of occupied dwellings.

#### **Energy Efficiency Multiplier**

The DfC Housing Association Guide offers an optional Energy Efficiency Multiplier which supports sustainable and energy efficient design beyond the existing statutory minimum SAP ratings for new build homes delivered via the Social Housing Development Programme. This offers benefits both for householders and the environment by providing fabric first solutions and minimising the need for additional mechanical fittings within newly constructed dwellings.

#### **Sustainable Design Standards**

Good housing design has a key role in meeting the aspirations of sustainable communities and protecting our environment, stimulating economic growth, maximising wellbeing and achieving social inclusion. The key objectives for sustainable social housing design are:

- Ensuring homes are liveable, comfortable, healthy, safe and help improve people's overall quality of life
- Protecting the environment and specifically reducing the effects of greenhouse gases and impacts of climate change
- Helping to tackle fuel poverty by reducing resident outgoings on fuel; and
- Leading by example and helping residents live sustainably.

#### **Future Homes Standard**

Currently, new and existing homes account for 20% of greenhouse gas emissions in the UK. If the government wants to meet its net zero emissions target by 2050, reducing the level of carbon emissions from homes is vital.

In England the Future Homes Standard is consultation finished in Jan 2020. If adopted, it will pave the way for all new homes in England from 2025 to be built with the latest generation clean technology such as air source heat pumps and cutting-edge solar panels, to drastically cut carbon emissions and keep bills low for homeowners.

In Northern Ireland we have made progress to reduce emissions from homes, however we need to go much further to ensure compliance with the Climate Change Act.

New homes being built in the next 10 years will still exist in 2050 and therefore we must ensure that the energy efficiency standards we set for them put us on track to meet the 2050 target. The Housing Executive would welcome a change in building regulation energy efficiency standards to deliver greater compliance with achieving Net Zero and provide better thermal comfort for householders.

#### Housing Executive Energy Efficiency measures within Planned Maintenance Works

In 2019/20, the Housing Executive invested approximately £23.7 million in energy efficiency measures within its planned maintenance programme across its own housing stock.



£1.6m on 1,361

double glazing installations (providing A-rated double glazed units)



## £21.8m on 5,694

heating conversions (energy efficient boilers) which includes zoning where practical and 270mm loft insulation

#### Solar Photovoltaic (PV) schemes within Housing Executive stock

In summer 2016, the Housing Executive completed a solar PV scheme in partnership with Saliis Ltd, to install solar panels into 1,000 homes using private finance based on the 'rent a roof' model. The Scheme was the first large solar PV project for residential properties in Northern Ireland, and has created household savings of £150 - £200 on annual energy bills. In conjunction with the Housing Executive Research Department, an evaluation of the first three years of the scheme to analyse savings in householder energy bills is ongoing. These results will be published by March 2021.

#### Oil Buying Clubs Service brought in by the Housing Executive

From 1st February 2020, the Oil Buying Club service was taken in-house by the Housing Executive, and the aim is to grow the service right across Northern Ireland.

The Housing Executive acknowledges the hard-work of Bryson Energy in developing and maintaining the 27 Oil Buying Clubs from a standing start back in 2014.

#### Benefits of an Oil Buying Club

An oil-buying club is a straightforward idea i.e. the more people that buy oil together, the cheaper the cost.

Members can order as little as 200 litres.

The service is free to join and open to all householders across Northern Ireland.

More orders in the same area means more efficient journeys for tankers, therefore providing a reduction in CO2 emissions.



#### **27 Oil Clubs**



**2.1m** litres of home heating oil delivered between April 2019 - March 2020

**5,174** members to date



(April 19 - March 20) (on the price of 300 litres) Living sustainably protecting the environment

#### **Housing Executive**

The Housing Executive has embarked on a multimillion pound investment programme to improve the energy performance of almost 2,700 of its homes across Northern Ireland.

The Energy Efficiency in Social Housing project has been made possible by funding of c. €23 million secured from the European Regional Development Fund (ERDF) through its Investment for Growth and Jobs Programme for Northern Ireland 2014-2020.

A further €22 million of funding is being invested by the Housing Executive.

This six year €45 million programme is expected to be completed by the end of 2023. A number of schemes have already been completed or are currently onsite across South Antrim, Causeway, Magherafelt and Omagh. The schemes include addressing the level of thermal efficiency in aluminium bungalows through the provision of new external wall cladding, new double glazing and improved insulation measures.

Two phases of the ERDF funded project, consisting of approximately 1900 dwellings to undertake External Wall Insulation to No Fines non-traditional housing stock is progressing well. It is hoped to commence works on site in 2021. A further and final phase of this programme consisting of approximately 700 dwellings will be briefed in the coming months.



#### European Union

European Regional Development Fund



#### Housing Executive Energy Efficiency Strategy

The purpose of the Housing Executive's Energy Efficiency Strategy for its existing homes is to minimise tenants' heating bills, fuel poverty, and carbon emissions.

The UK government has adopted a target of 'Net Zero' emissions by 2050. This implies that current and new homes, which will be in existence long past this date, must be very well insulated, and that they should primarily use renewable energy for heat and power.

Adopting a "Fabric First" approach by insulating our dwellings, reduces fuel poverty and works well with a wider range of future heating systems. It will be compatible with an increased use of local renewable energy resources, when we must urgently reduce our burning of fossil fuels. Therefore, this needs to align with any future heating policy considerations.

The strategy will take into account the likely measures needed to improve the SAPs of dwellings set against the availability of funds when considering how to 'futureproof' Housing Executive homes, at a time when major changes in NI government energy policy are likely.



#### **Cavity Wall Insulation Research Project**

In 2019 the Housing Executive published a research report on Cavity Wall Insulation in Northern Ireland. The research was undertaken by the British Board of Agrément (BBA).

The findings for the Housing Executive's stock were based on a sample survey of 825 properties. BBA found that 63% of these properties had cavity wall insulation installations that were non-compliant with modern industry standards because there were found to be voids or debris in the cavity.

The Housing Executive has published a Draft CWI Action Pan for its stock in response to BBA's findings and recommendations. This was launched in December 2020 for public consultation requesting responses by 31 March 2021.

# CHARDER CONTRACTOR OF CONTRACT

#### **HANDIHEAT Project**

The aim of the €2m EU-funded HANDIHEAT Project, which is in the third year of its implementation, is to contribute to improvements in energy efficiency by demonstrating the effectiveness of renewable energy solutions in isolated rural communities across northern Europe.

There is a further focus on identifying best practice and providing evidence to support future policy interventions in this area of activity. The Housing Executive fulfils dual roles in the context of the Project, acting as the Lead Partner, as well as developing and assessing the benefits of a demonstration pilot involving the installation of renewable technology in a small number of Housing Executive owned homes in Lisnaskea, Co Fermanagh.

In its role as Lead Partner for the Project, the Housing Executive is co-ordinating the activities of six partner organisations across 5 European countries within the Northern Periphery and Arctic (NPA) region. The partners are the Pure Energy Centre (Shetland); Austurbrù (Iceland); ARC Healthy Living Centre (N Ireland); Clár Irish Centre for Housing (Republic of Ireland); Luonnonvarakeskus (LUKE) Natural

Resources Institute (Finland) and Karelia University of Applied Sciences (also Finland). Ulster University and PowerOn are also involved in the Project as associate partners.

The collective focus of the partners is to identify practical renewable energy solutions; develop best practice models;

devise renewable energy toolkits; and produce training and road maps for rural communities affected by fuel poverty due to heavy reliance upon imported fossil fuels for the production of energy.

The feasibility of innovative heating solutions is being evaluated through two demonstration pilots on sites at Vártsila, in northern Finland and Lisnaskea, in Co Fermanagh, Northern Ireland.

The Housing Executive will work with the Department for the Economy and DfC to ensure that best practice and future technological innovations are reflected in the Energy Strategy and the Fuel Poverty Strategy for Northern Ireland, respectively.

A final conference is scheduled to be held in Belfast during September 2021 as a means of drawing the HANDIHEAT Project to its formal conclusion.

1. The Northern Periphery and Arctic 2014-2020 forms a cooperation between 9 programme partner countries. The NPA 2014-2020 is part of the European Territorial Cooperation Objective, supported by the European Regional Development Fund (ERDF) and ERDF equivalent funding from non EU partner countries.



#### Vártsila pilot

Karelia University of Applied Sciences (KUAS) has continued to progress the technical implementation of the Vártsila pilot, where heating-oilreliant systems have been replaced with compressed biogas (CBG) boilers in twenty rural homes.

During March 2020, the CBG boilers (pictured) were used for the first time to meet part of the heat demand in conjunction with the existing oil heating systems.

The only by-product of the CBG boilers is warm steam. KUAS is also continuing to develop an economically and environmentally sustainable biogas transportation action plan, and completed a biogas car-fuelling demonstration project for the local community in September 2020.

HANDIHEAT

handiheatproject.eu/



@handiheat



@handiheat.eu

#### Lisnaskea pilot

The second pilot demonstration which is being led by the Housing Executive aims to explore the potential benefits of hybrid electricity generation and storage solutions for six Housing Executive owned properties in Lisnaskea, Co Fermanagh.

This pilot will evaluate a combination of hybrid installations in these properties, including oil/electric boilers; air source heat pumps; solar photovoltaic panels; and battery storage systems as well as energy efficient insulation measures.

In the strategic context of the Clean Growth Strategy, there is an imperative to find alternative energy sources to counteract the current high level of fossil fuel consumption, particularly in rural settlements that do not have access to alternative sources of low carbon heating.

The Fermanagh pilot is also being supported by associate partners, PowerOn, which specialises in energy storage solutions (storage batteries) and staff from the Ulster University, who will analyse and monitor the effectiveness of the hybrid systems over a 24 month period.

Data from the pilot will be analysed to assess the suitability of low carbon and hybrid options as alternatives to oilfired boilers, which are still the predominant fuel source currently being installed in Northern Ireland.







#### The focus on Energy Efficiency activity undertaken by local Councils



#### Harbour House Smart Heating Project Derry & Strabane Council

This historic sandstone building located in Derry City was built in 1882 and was originally used as the Londonderry Port and Harbour Commissioners' Headquarters. The building is now owned by Derry City and Strabane District Council and is used as office space for democratic services administration within the council. The building is heated with natural gas and although there is some level of thermostatic control of heating within the building, the heating costs are in the region of £8,000 per annum.

An energy audit carried out in November 2018 highlighted inefficient control of heating zones and increased thermal energy use. The issue for the Council was how it could improve heating control within the building without disrupting the building fabric.

Heatboss is an innovative technology that tackles the issues with conventional heating controls - for example, in Harbour House, the current control strategy typically heats areas not in use, and has one target temperature with the same on/off times for multiple rooms. Such control systems encourage overheating which was originally highlighted during the 2018 energy audit. Heatboss wireless devices and web applications enable room level control of heating, which is accessible securely and remotely from any web enabled device. This enables better efficiency, comfort and control of heating large buildings. Ultimately, this leads to a significant reduction in energy consumption with reported energy savings of approximately 30% in other historic buildings. Heatboss is very sympathetic to the needs of heritage buildings such as Harbour House - the retrofit installation process and the wireless nature of the product ensures that the building fabric is never disturbed.

Derry City and Strabane Council have worked with Heatboss to come up with an innovative wireless enabled smart heating system that suits the individual requirements of this building.

The Harbour House solution uses the existing zone valves and maximises their effectiveness by requesting heat in each zone as and when required to the target temperature of the zone which accurately reflects how the building is used.

This can be easily and remotely adjusted by a web app rather than manual adjustment or changes to the BMS which is currently located in another building adjacent to Harbour House. The council expect to have the system installed and commissioned before Christmas 2020. The energy usage will then be monitored and analysed using the 'Wattics' system - a cloud based real time energy management programme.



#### **Energy Efficiency activity within the Housing Association Sector**

Good housing design has a key role in meeting the aspiration of delivering sustainable communities and protecting our environment, stimulating economic growth, maximising wellbeing and achieving social inclusion. Local housing associations play a central role in the construction of high quality, energy efficient new homes throughout Northern Ireland. "We are all really impressed with the new lights. There are so much brighter than the old one's and really help to provide a nice bright and safe atmosphere in the corridors and outside areas of the scheme. We also really like the automatic lights in the corridor and works really well in staying on long enough to get from the lift to our apartment."

#### **Housing Association Movement: Case Study**



#### **Choice Housing Ireland Ltd**

Choice is one of the largest independent housing associations in Northern Ireland providing high quality homes and care and support services to help meet the diverse needs of a wide range of customers, including older people, families, mature singles and people with complex needs.

Choice understands that energy cost is a concern for tenants and have put various measures in place to ensure that the homes they provide are some of the most energy efficient in the country.

#### LED Upgrade saves money for Choice Tenants

In 2019/20 Choice Housing carried out lighting upgrades at a number of their sheltered or supported housing schemes, with LEDs fitted along with sensors to ensure lighting is available when it is required.

Choice has an 'Energy & Sustainable Development Strategy' in place, as well as a target to invest £150,000 over two years in enhanced energy projects. LED lighting in common areas of housing schemes was quickly identified as a worthwhile investment, and so 3 housing schemes were selected to have this upgrade carried out. This is in addition to other schemes where similar upgrades were carried out due to existing lighting coming to the end of its life.

In total, across these 3 schemes over £60,000 was invested, with numerous benefits for Choice and their tenants. Electricity costs are normally passed on to tenants as part of service charges, and so reduced electricity consumption will not only have a positive impact on the environment, but it will also deliver financial savings for tenants. In addition, the new lighting is anticipated to reduce maintenance costs for the Association and have an extended life expectancy.

One area often overlooked is the quality of light which offers health and safety benefits. Positive feedback was received in this context from a number of tenants, including one comment that it was an improvement for their painting classes which were held in the common room at one of the schemes.

# To have a more equal socir (

Measures to provide a secure sustainable energy mix Northern Ireland continues to have amongst the lowest levels of household income across the UK and the highest weekly household expenditure on energy of any UK region. Taken in conjunction with challenging economic conditions as well as the ongoing global pandemic, many families continue to face challenges with meeting their energy costs.

In order to ensure economically sustainable continuity of supply, Northern Ireland needs to target energy infrastructure investment to provide an appropriately regulated energy supply, and continue to take account of the Government's legislative commitment to achieving net zero carbon emissions by 2050, without putting an excessive financial burden on consumers.

In terms of its own stock, the Housing Executive continues to install natural gas-powered heating systems, in preference to those fuelled by home heating oil (kerosene). Natural gas remains the Housing Executive's preferred solution because of on-going price security and a regulated energy supply.

The Housing Executive recognises the need for low-carbon solutions (in the short term) and net-zero options (in the longer term) and in this context, continues to explore the potential benefits of such solutions through a series of pilot projects, including the EU-funded Handiheat Project in Lisnaskea and the Girona Project in Coleraine.

These projects focus on decarbonising domestic heating systems and / or providing a role for householders within a new energy market where they can be energy providers and energy consumers.

The Housing Executive is also focused on the benefits which could result from changes to local energy tariff structures and view the ongoing curtailment of renewable energy as a benefit which vulnerable householders could utilise based on the correct market and regulatory conditions.



#### **Phoenix Natural Gas**

own and operate the gas distribution network in the Greater Belfast, Larne and East Down areas of Northern Ireland. The Phoenix Natural Gas network makes natural gas available to some 340,000 properties, with around 225,000 of these properties currently connected, and continues to make gas connections to around 8,000 properties per year. Phoenix Natural Gas is responsible for developing and maintaining the pipeline network and providing a 24/7 operational and transportation service platform for gas supplier and gas consumers.



#### SGN Natural Gas (Scottish Gas Network)

continues to develop the natural gas network in counties Derry-Londonderry, Tyrone and Fermanagh. Over 200 customers are now connected to the network in Strabane with demand continuing to surpass expectations.

In 2019/20, SGN made 281 new gas connections.



#### **Firmus Energy**

currently has natural gas available to over 120,000 homes and businesses throughout its network area, which stretches from Newry through the central corridor in NI to Derry-Londonderry. In 2019/20, Firmus made 5,500 new gas connections.

#### The Integrated Single Electricity Market (I-SEM)

This is the established wholesale electricity market arrangement for the Republic of Ireland and Northern Ireland. These market arrangements are designed to integrate the all-island electricity market, with European electricity markets, making optimal use of cross-border transmission assets, which should help put a downward pressure on prices as well as encouraging greater levels of security of supply and transparency.

#### BREXIT

The SEM Committee\* noted the impending impact of BREXIT. "From 1 January 2021, regardless of the outcome of the future partnership negotiations between the EU and the UK, the SEM will continue to operate as an all-island market. Trade between the SEM and the market in Great Britain, through the Moyle and EWIC interconnectors, will also continue, although this trade may be less efficient, as it will no longer be possible for some platforms that currently operate under EU rules to continue to do so."

#### **Customer Value**

Within the Utility Regulator Quarterly Transparency Report in November 2020 noted "For period one (January to June) 2020 electricity pricing data sourced from Eurostat and individual supplier's submissions under the REMM framework the current pricing data illustrates that Northern Ireland domestic electricity prices continue to rank below the EU median (18.5 p/ kWh) and are lower than the Republic of Ireland (21.1 p/kWh) and the UK (19.3 p/kWh).'"

\*The SEM Committee is the decision-making authority for the Single Electricity Market on the island of Ireland.

#### NI Consumer Council (during 2020)



140,000

people compared energy prices on the main Consumer Council website to identify potential energy savings

#### Measuring energy efficiency investment

During 2019/20, the Housing Executive invested approximately £37.5m in order to improve thermal efficiency, influence and increase strategic action to tackle fuel poverty and improve access to energy efficiency measures and advice across Northern Ireland working with the Department for Communities.

Our indicators show:



# 71,000

consumers used the Consumer Council's domestic energy cost comparison tool (Electricity & Gas)

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## 40,000

viewed the home heating oil price page

2019/20 Energy Efficiency Investment via the Housing Executive	£
Housing Executive Heating Schemes	21,834,000
Housing Executive Double Glazing	1,667,000
External Thermal Improvements	201,000
DfC Affordable Warmth	12,316,000
DfC Boiler Replacement	1,424,000
Energy Marketing, Energy Advice Line, Oil Buying Clubs & Housing Executive HeatSmart Programme	59,000
Fund NEA	45,000
TOTAL	37,546,000

These figures do not include the NI Sustainable Energy Programme investment of £7.4 million for energy efficiency schemes or Housing Associations' energy efficiency measures of £5.1m

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Area of Activity	Position at the end of 2018/19	Indicators	Action	Progress during 2019/20
Improving Domestic Energy Efficiency	Preparatory work for the 2022 House Condition Survey (HCS) is on-going. SAP ratings; the extent of home heating oil dependency; and the energy efficiency of NI's housing stock will be all be re-assessed as part of the new HCS in 2022.	Initiatives/ Measures to improve energy efficiency	Evaluate/ Review data	<ul> <li>The work for the NI HCS 2022, is ongoing and the assessment of the following will be included:</li> <li>1. Fuel Poverty</li> <li>2. Household energy efficiency</li> <li>3. Household energy type</li> <li>4. Ongoing cost of Energy Efficiency retrofit</li> <li>5. Reduction in Carbon dioxide emissions</li> </ul>
	Housing Executive staff promoted energy efficiency measures at the following public events/exhibitions: SelfBuild Live Belfast Show, 22-24 February 2019 The Balmoral Show, 15-18 May 2019 Love Your Home exhibition, 11-13 October 2019 Housing Executive partnered the Energy Saving Trust in the delivery of its 'Energy Week' campaign 18-22 November 2019 Housing Executive participated in National Energy Action's (NEA) UK-wide Fuel Poverty Awareness Day 15 February 2019 Bryson Energy provided energy efficiency advice to c. 7,000 households via the 0800 Freephone Energy Advice Line 6,300 Housing Executive tenants received HeatSmart energy efficiency advice Energy advice provided to 130+ primary schools via the Schools Energy Efficiency Awareness Programme Home Energy School Poster Competition launched in May 2019 & completed in June 2019 National Energy Action provided energy efficiency advice to a range of voluntary organisations 17 Housing Executive staff trained by NEA to Level 3, City & Guilds 6281-01 Energy Awareness gualification	Improved access to energy efficiency advice (number of customers)	Market the energy efficiency message	<ul> <li>Housing Executive staff promoted and engaged in a range of virtual events during 2020.</li> <li>Page dedicated to the Northern Energy Advice Service in the Love Your Home Magazine.</li> <li>Housing Executive participated virtually in the National Energy Action (NEA) UK-wide Fuel Poverty Awareness Day 27th November 2020.</li> <li>The Northern Ireland Energy Advice Service was brought in-house by the Housing Executive and formally launched via a virtual Webinar in August 2020 and continues to provide advice to households via 0800 111 4455 and the Get-in-touch facility on the Housing Executive's website.</li> <li>The Housing Executive entered into a partnership with Keep Northern Ireland Beautiful to deliver our schools energy efficiency awareness programme (SEEAP).</li> </ul>

#### **Outcomes: Improving People's Homes and Helping to Transform their Lives**

E's Fuel Poverty Update indicated that (by 2018) % of households (131,000) in NI were in fuel rerty (based the 10% Definition used in the 2016 S). This was a decrease of 4 percentage points inpared to the 22% recorded in the 2016 HCS. 90 replacement boilers installed through the ler Replacement Scheme £1.9m investment. EP contributed funding of almost £7.4m vards the installation of energy efficient heating tems and insulation measures.	Measured within NI House Condition Survey Increase of affordable warmth for disadvantaged energy consumers (NI Housing Condition Survey Fuel Poverty average) Implement energy efficiency schemes	Provide fuel purchasing opportunities for low income families Provide fuel purchasing	<ul> <li>2,161 boilers installed through the Boiler Replacement Scheme £1.4m investment</li> <li>Affordable Warmth Scheme expenditure £12.3m</li> <li>NISEP contributed funding of almost £7.4m towards the installation of energy efficient heating systems and insulation measures.</li> </ul>
mber of Oil Buying Clubs remained static at 27 ing 2018/19	Implement energy efficiency schemes	Provide fuel	Housing Executive took the service back in-
ings of 11.7% below NI average price	within social and private housing sectors	opportunities for low income families	Number of Oil Buying Clubs remained static at 27 but with plans to increase Club numbers and membership 5,174 members purchased over 2.1m litres of home heating oil during 19/20. Savings of 12.8% below NI average price.
63 Affordable Warmth Measures in 3,205 nes. Reduction in budget from previous years.	Increase of affordable warmth for disadvantaged energy consumers (NI Housing Condition Survey Fuel Poverty average)	Implement energy efficiency schemes within social and private housing sectors	4,635 Affordable Warmth Measures in implemented in 2,594 homes.
r	ngs of 11.7% below NI average price 33 Affordable Warmth Measures in 3,205 nes. Reduction in budget from previous years.	ngs of 11.7% below NI average price 33 Affordable Warmth Measures in 3,205 hes. Reduction in budget from previous years. Increase of affordable warmth for disadvantaged energy consumers (NI Housing Condition Survey Fuel Poverty average)	ings of 11.7% below NI average price 33 Affordable Warmth Measures in 3,205 hes. Reduction in budget from previous years. Reduction in budget from previous years. Increase of affordable warmth for disadvantaged energy consumers (NI Housing Condition Survey Fuel Poverty average) Implement energy efficiency schemes within social and private housing sectors

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Area of Activity	Position at the end of 2018/19	Indicators	Action	Progress during 2019/20
Living Sustainably - Protecting the Environment	<ul> <li>Housing Executive invest £45 million in energy efficiency works to Aluminium Bungalows and No Fines properties between 2020-2023 (50% funding came from European Regional Development Fund)</li> <li>Housing Executive external cladding for over 91 Aluminium bungalows.</li> <li>Cavity Wall Research published and field trails are ongoing to inform future strategy and policy.</li> </ul>	Increased innovation in sustainable energy efficiency	Research and install innovative measures to create more efficient homes	The ERDF work is ongoing with a further and final phase of the programme consisting of approximately 700 dwellings will be briefed in the coming months. The Housing Executive are finalising a Draft CWI Action Plan for it stock response to British Board of Agrement's findings and recommendations. It will be issued for public consultation in the coming months.
	EU Interreg project (€2m) was secured in July 2018 and commenced on 1st Oct 2018 as the HANDIHEAT Project, with the Housing Executive as Lead Partner, investigating improved energy efficiency and renewable technologies for rural communities. ISO14001:2015 accreditation for the Housing Executive's Headquarters building in Adelaide Street was reconfirmed in June 2019.	Increased innovation in sustainable energy efficiency	Seek to increase electricity consumption from renewable resources	<ul> <li>The HANDIHEAT project commenced in October 2018 and to date the four key work streams are being delivered as per the project timelines, namely:</li> <li>a. Policy Review of Fuel Poverty and Poor Housing from Poor Health.</li> <li>b. Best Practice Review of Energy Efficiency and Renewable solutions across Northern Europe.</li> <li>c. Two pilots to investigate low carbon heating solutions (electrify heating and biogas heating, along with whole house improved energy efficiency measures).</li> <li>d. A toolkit of solutions for rural communities across the partner countries of Northern Europe.</li> <li>Housing Executive gained Silver in the Business in the Community Environmental Benchmarking Survey 2020</li> <li>ISO 14001:2015 Environmental Accreditation was awarded to the Housing Centre and Direct Labour Organisation Offices in Portadown.</li> </ul>

#### Outcomes: Improving People's Homes and Helping to Transform their Lives

To have a More         New natural gas connections:         Reduction from 68%         Provide         New gas connections during 19/20           Emul Conject         Description         Description         Description         Description
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Equal Society Phoenix 8,000 Indusendid reliant I measures Phoenix 8,000
Scottish Gas Network 500 on oil based heating to secure Scottish Gas Network 281
Firmus 13,000 systems (HCS) energy mix Firmus 5,500

#### Conclusion

This has been a challenging year for the energy efficiency sector, as with wider society across Northern Ireland. However, during the past year there has also been growing recognition that sustainability and resilience are central to national recovery plans post COVID-19, and there remains a clear focus on the need to ensure that our local actions make a positive contribution towards addressing the wider global climate emergency.

The Housing Executive welcomes the on-going work of the Department for the Economy to provide a new Northern Ireland Energy Strategy which will offer guidance on the transition to a Zero carbon and climateresilient society in future years. The Housing Executive also looks forward to the publication of NI Climate Change Act, as envisaged in the Northern Ireland Executive's "New Decade, New Approach" paper. The Housing Executive notes the recent announcement from the Commission of Climate Change that Northern Ireland will need to reduce 60% of its Greenhouse Gases over the next 15 years and the need to increase spending on climate change across all sectors to approx. £2-2.5Bn per year from the 2030's.

This analysis supports the findings from the recent Housing Executive commissioned BRE report to investigate the financial and carbon impact of improving energy efficiency in the road toward net zero. The findings indicate that, depending on the methodology used, Northern Ireland will have to spend between £9.2-12.9 Billion\* in the long term to achieve a total energy cost saving for householders of £409 million and a total CO2 saving of 2.2 million tonnes, which would significantly reduce NI GHG emissions. The Housing Executive will also continue to work in partnership with the Department for Communities, the Utility Regulator, local Councils and other key stakeholders, to secure further reductions in energy consumption; deliver improvements in energy efficiency and to conduct research which will help to inform the development of de-carbonised heating solutions and improved energy efficiency. All of this work will assist in the on-going effort to alleviate Fuel Poverty and minimise carbon emissions across all households in Northern Ireland.

\*Spend range is based on achieving SAP Band B using the SAP methodology and the NI scenarios

#### References

- The Housing Executive Corporate Plan, Regional Services, 2017/18 2020/21
- Northern Ireland House Condition Survey 2016 (HCS)
- NI Executive. Programme for Government Consultation 2021
- BRE/NIHE. Estimates of Fuel Poverty in Northern Ireland in 2017 & 2018 (May 2019)
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#### **Acknowledgements**

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This document is available in alternate formats.

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