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## Summary report

# RESIDENTIAL ENERGY REDUCTION IN WALES

## Improving the energy efficiency of Welsh homes: A National Infrastructure Priority

Improving energy efficiency of our homes has long been advocated as a way to improve people's lives, bringing benefits for society, the economy and the environment.

### Background

Upgrading our housing stock through retrofitting energy saving measures not only reduces energy demand and helps tackle climate change by reducing emissions; it also contributes to economic growth and job creation, as well as tackling fuel poverty<sup>1</sup>.

A comprehensive programme of energy efficiency measures should therefore be a cornerstone programme for the implementation of Wellbeing of Future Generations (Wales) Act 2015 and essential to a future Programme For Government.

One of the key aims of this programme needs to be contribution to Welsh Government's two key overarching targets for reducing greenhouse gas emissions in Wales - to reduce emissions by 3% annually<sup>2</sup> and to reduce overall emissions by 40% by 2020<sup>3</sup>.

<sup>1</sup> Spreading the Net: the Multiple Benefits of Energy Efficiency: IEA [http://www.iea.org/publications/insights/ee\\_improvements.pdf](http://www.iea.org/publications/insights/ee_improvements.pdf)

<sup>2</sup> The 3% emissions reduction target requires a 3% year-on-year emissions reduction in all areas of devolved competence in Wales. To achieve the target, emissions must therefore be reduced by 27% (9 years at 3% annual reduction) compared to the baseline of average emissions between 2006 and 2010.

This gives a target emissions level of 5.60 MtCO<sub>2</sub>e by 2020. The target is based on 'non-traded' emissions however, the target also includes 'end-user electricity' emissions – these are the 'traded' emissions produced due to electricity consumption.

<sup>3</sup> The 40% emissions reduction target aims to reduce all emissions in Wales by 40% compared to 1990 levels. This target includes all emissions, not just those which fall within the Welsh Government's devolved powers. The target is measured based on 'source' emissions, meaning it only includes emissions which are directly released by each sector of the economy.

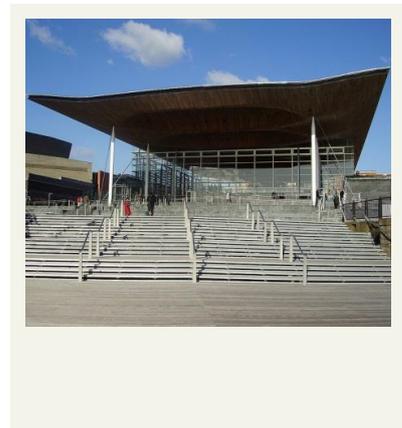
Emissions from the residential sector in Wales are responsible for 24% of emissions covered by the 3% target. Programmes in this sector therefore offer opportunities for considerable impact on overall emissions. To understand the scale of emission reduction needed from this sector to meet these targets analysis on the impact of programmes to date is required.

In 2012 we published research, carried out by the Energy Saving Trust (EST), on the impacts of energy saving measures in the residential sector on cutting emissions, as well as the wider impacts on our economy and society, – ‘*Cutting Carbon Emission in Welsh Homes – a twin track approach*’<sup>4</sup>. This explored options for, and the economic impact of, raising the quality of all homes in Wales to a SAP<sup>5</sup> rating of D, advocating that Welsh Government should help fund this work in the poorest households.

In 2015 we commissioned EST to undertake a new study to review progress in home energy efficiency measures and impacts on emission reduction. It also considers how different energy efficiency measures and policy scenarios compare in terms of reducing emissions and meeting targets between now and 2020. The resulting report is ‘*Progress towards residential energy reduction targets in Wales*’<sup>6</sup>. A summary of the findings are provided below.

### Impacts of Government policies

EST's modelling indicates that, between 2007 and 2014, energy efficiency programmes in Wales prevented the release of around 2.0 MtCO<sub>2</sub>e. The programme responsible for both the greatest number of energy efficiency installations and the greatest carbon reduction was the Carbon Emissions Reduction Target (CERT)<sup>7</sup>, a UK government programme which ran from 2008-2012.



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<sup>4</sup> [http://assets.wwf.org.uk/downloads/cutting\\_carbon\\_emissions\\_in\\_welsh\\_homes.pdf](http://assets.wwf.org.uk/downloads/cutting_carbon_emissions_in_welsh_homes.pdf)  
[http://assets.wwf.org.uk/downloads/housing\\_report\\_\\_english\\_summary\\_.pdf](http://assets.wwf.org.uk/downloads/housing_report__english_summary_.pdf)

<sup>5</sup> The Government Standard Assessment Procedure (**SAP**) for short is used as the methodology within England and Wales to assess the performance of domestic dwellings. This assessment has been introduced to meet the requirements set out by the European Energy Performance of Building Directive.

<sup>6</sup> Our latest research is not comparable to economic impact analysis within the 2012 report due to a lack of new data on housing conditions in Wales. However, it complements the earlier report by updating the progress in reducing carbon emissions from the housing sector.  
[http://assets.wwf.org.uk/downloads/150724\\_final\\_report\\_copy.pdf](http://assets.wwf.org.uk/downloads/150724_final_report_copy.pdf)

<sup>7</sup> This set an obligation on energy providers to achieve carbon dioxide emissions reductions from domestic building.

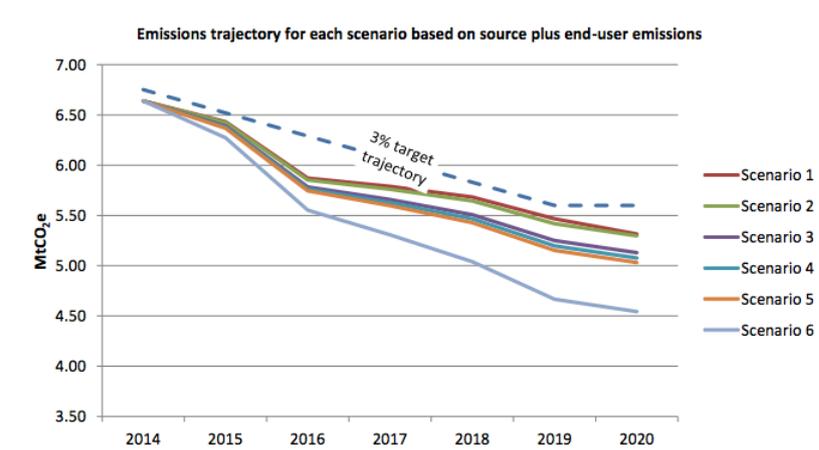
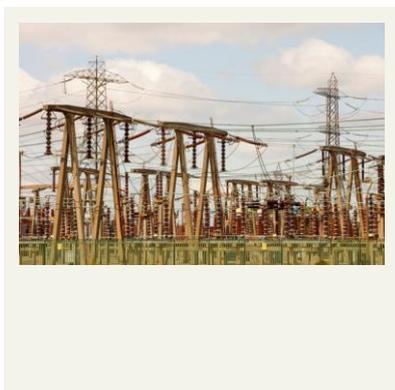
CERT accounted for over 70% of installed energy reduction measures and was responsible for only 39% of the emissions reduction. Other policies have had a much bigger impact on a per-measure basis; in particular, the Feed-in Tariff has contributed almost a third of the emissions reduction, despite accounting for only 5% of total installs<sup>8</sup>.

The Welsh Government schemes Nest and Arbed, combined, accounted for 8% of the emissions reduction. Cumulatively, they have prevented the release of 0.17MtCO<sub>2</sub>e between 2007-2015. The remaining 92% of policy-based emissions reduction, 1.85 MtCO<sub>2</sub>e, is attributable to schemes led by the UK government.

## Meeting the 2020 targets

### 3% annual reduction

EST modelling indicates that the residential sector is on-target to meet its 3% year-on-year reduction commitment, leaving the sector well placed to achieve the 2020 target even with minimal on-going action - provided that there is significant grid decarbonisation. However, that can not be taken for granted so different scenarios are proposed incorporating measures to improve energy efficiency.



The most viable option for meeting the 3% annual reduction by 2020 target, is Scenario 5 - a 100% uptake of condensing boilers, loft installations, draught proofing, and cavity wall installation. This would bring domestic emissions down to 5.03 MtCO<sub>2</sub>e, thereby exceeding the 5.60 MtCO<sub>2</sub> target for 2020 by

<sup>8</sup> This does not take into account the relative cost of these measures.

about 10%. This would allow cushioning for grid decarbonisation variability.

Since electricity generation is outside of the Welsh Government's devolved powers, this high dependence on decarbonisation leaves progress towards the target vulnerable to processes outside Welsh Government's control. To reduce this vulnerability, Welsh Government must focus greater efforts on reducing energy consumption through improving the energy efficiency of the housing stock, rather than relying on reduced carbon intensity of the energy itself.

#### 40% reduction from 1990 baseline

The EST report also considers the actions required to progress towards a 40% reduction in carbon emissions from homes compared to a 1990 baseline<sup>9</sup>. Since 'source'<sup>10</sup> emissions from the residential sector are predominantly due to heating, achieving the target will require investment both in methods to reduce heating demand (for example, through insulation) and to reduce the carbon intensity of heating fuels (for example, using renewable heating sources).

Achieving a 40% reduction in the residential sector would require the 1990 baseline emissions of 5.01 MtCO<sub>2e</sub>/year to be reduced to 3.01MtCO<sub>2e</sub> by 2020. EST suggests that the most viable scenario which could achieve this 40% target is, in houses suitable for these measures, 100% uptake of cavity wall insulation, loft insulation, draught proofing and condensing boilers; 25% uptake of solid wall insulation; uptake of renewable heat into 25% of homes<sup>11</sup>.

This modelling theoretically demonstrates how the targets can be met, but is an extremely challenging policy scenario. Welsh Government should look to increase programmes for emission reduction from other sectors to develop a more practically possible target<sup>12</sup>.

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<sup>9</sup> There is currently no Government commitment to this scale of reduction in individual sectors, such as housing. In the absence of such targets the analysis translated the all emissions 40% reduction by 2020 to the residential sector.

<sup>10</sup> The target is measured based on 'source' emissions, meaning it only includes emissions which are directly released by each sector of the economy. When looking only at the residential sector in isolation, emissions due to electricity consumption are not included within the target. The 'source' emissions from the residential sector therefore does not include any emissions related to electricity use; any measures which impact emissions from electricity use (such as installation of low energy lighting or solar photovoltaics) therefore have no impact on progress towards the 40% residential target.

<sup>11</sup> Much of the renewable heat is assumed to come from heat pumps, the analysis discounting the carbon emissions from the electricity required for these.

<sup>12</sup> It is unlikely that a 40% decrease in source emissions in the residential sector will be required to meet the overall target if greater emission savings in other areas (such as

### Costs of programmes

The most viable option identified for 3% annual reduction would cost £860 million to £1.3 billion. The most viable option on 40% reduction by 2020 would require over 2.2 million energy efficiency measures, at a cost of around £5.2 to £9.3 billion.

A report by Cambridge Econometrics and Verco<sup>13</sup> shows the investment required for improving the energy performance of the whole UK housing stock to EPC band C by 2035 is £53 billion. The Institute of Welsh Affairs<sup>14</sup> calculated, the cost of raising houses up to Band C is the equivalent to about £3 billion in Wales. This would equate to £780 million within the next Assembly term or £800 million<sup>15</sup> spend by 2020. This provides a complementary comparison to the EST costings using EPC assumptions for Welsh housing stock<sup>16</sup>.

If the UK Government made a commitment to bring all homes in the UK up to a SAP rating of C by 2035, and to allocate funding of £800 million for this work in Wales between now and 2020. This would go a long way to ensuring that emissions from the residential sector in Wales keep reducing at 3% per year.

National Energy Action<sup>17</sup> estimates that £690m will be received by the Treasury in the next five years through VAT and carbon taxes from domestic energy consumers in Wales. It would make sense, given all the benefits mentioned above, for the Government to ring-fence this sum for investment back into the domestic sector.

The balance between the £690m and £800m (or even the EST's estimate of over £860 million) could be made up by the Welsh Government. For comparison, the Scottish Government is proposing to invest £114 million per year in home energy

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the power generation sector) are undertaken. As such, our comparisons of scenarios to a 40% reduction of source emissions in the residential sector may exaggerate the ongoing action required in this sector.

<sup>13</sup> Building the Future: The economic and fiscal impacts of making homes energy efficient <http://www.energybillrevolution.org/wp-content/uploads/2014/10/Building-the-Future-The-Economic-and-Fiscal-impacts-of-making-homes-energy-efficient.pdf>

<sup>14</sup> [http://www.clickonwales.org/wpcontent/uploads/IWA\\_EconomicStrategyforWales.pdf](http://www.clickonwales.org/wpcontent/uploads/IWA_EconomicStrategyforWales.pdf)

<sup>15</sup> Figure based on the £1.3 billion over 5 years to get the UK on its way to all homes being SAP C by 2035. Assuming that refurbishment costs in Wales are likely to be higher than in other parts of the UK; e.g. due to propensity of single walled houses.

<sup>16</sup> The Welsh House Condition Survey has not been updated for a number of years and is therefore unavailable,

<sup>17</sup> 2015 UK Fuel Poverty Monitor; <http://www.nea.org.uk/media/media-releases/2015/030615-01>

efficiency<sup>18,19</sup>. If the Welsh Government were to make a proportional spend based on relative budget, it would mean about £50 million/year here.

### WWF Cymru recommendations for programmes and policy

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The EST report has provided comprehensive evidence on which to base future policy and programmes. WWF Cymru has developed the following suggestions which we hope to explore further through working with stakeholders including the Welsh Government.

- Welsh Government cannot continue to rely heavily on UK Government decarbonisation of grid, ECO, targeted loans or similar initiatives to meet its targets. Instead it needs to accelerate its own programmes to fill the gap from likely scaling back of commitment by UK Government in this area.
- The scale and costs of retrofits is a major challenge. An energy efficiency programme should therefore be seen as a long term infrastructure plan priority backed up with a commitment to a multi-million pound capital investment programme.
- Based on UK data, Welsh Government needs to recognise the need for and urge the UK Government to make a commitment to bring all homes in the UK up to a SAP rating of C by 2035 and allocate funding of £800 million for this work in Wales between now and 2020.
- The Welsh Government should increase its funding to meet the gap between UK spend and the scale of measures required of approximately £50 million a year. Arbed and Nest schemes have achieved good results, but significant scaling up is needed to adequately address the dual issues of the energy efficiency of homes and fuel poverty.
- A new strategic approach to the uptake of low carbon heat to compliment the energy efficiency programmes and contribute to emission reduction from the residential sector is needed.

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<sup>18</sup> Scottish Government Draft Budget 2015-16 - response to Economy, Energy and Tourism Committee report, 2 March 2015  
[http://www.scottish.parliament.uk/S4\\_EconomyEnergyandTourismCommittee/General%20Documents/20150302\\_John\\_Swinney\\_to\\_Convener.pdf](http://www.scottish.parliament.uk/S4_EconomyEnergyandTourismCommittee/General%20Documents/20150302_John_Swinney_to_Convener.pdf)

<sup>19</sup> Economic impact of energy efficiency investment in Scotland  
<http://www.consumerfutures.org.uk/reports/economic-impact-of-energy-efficiency-investment-in-scotland>

**FOR MORE INFORMATION**

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