

WORK IN PROGRESS - This document may be incomplete and not peer reviewed.

Comments and corrections are welcome.

Building - Housing (B?) Sub Report

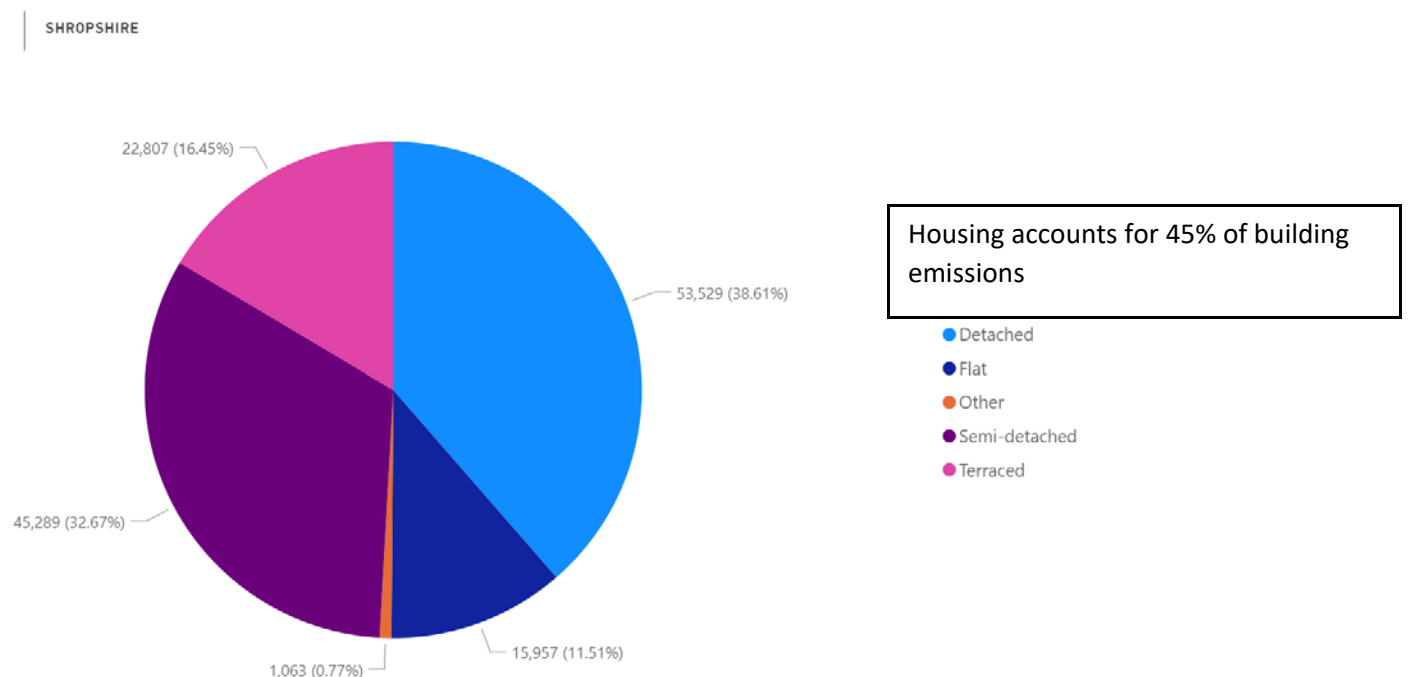
A Current situation – Existing dwellings

There are currently **145,434** dwellings in Shropshire (Shropshire Council March 2020 [[https://www.shropshire.gov.uk/information-intelligence-and-insight/facts-and-figures/shropshire-snapshots/housing/168 Primary](https://www.shropshire.gov.uk/information-intelligence-and-insight/facts-and-figures/shropshire-snapshots/housing/168%20Primary)] This sector represents the single most significant contribution to total carbon emissions by buildings in Shropshire (45%). The split by type is:

1. Detached	39%
2. Semi Detached	33%
3. Terraced	16%
4. Flat	11%
5. Other	1%

Of these 71% are owned, with a fairly even split between private rented (15%) and social rented/shared ownership (14%).

[<https://www.shropshire.gov.uk/information-intelligence-and-insight/facts-and-figures/shropshire-snapshots/housing/#>]



It is assessed that these homes produce some 800,000 tonnes of carbon emissions annually of which at least 500,000 could be saved by moving away from fossil fuels.

A particular characteristic of the sector is the age of the buildings with low performance of the building fabric in terms of insulation and air tightness [ref ZCS EPC Report] and a reliance on fossil fuels for space heating (natural gas/oil/LPG/coal)

'Retrofitting' is the answer, but whilst the rented sector has had to meet at least a minimum EPC rating since 2018 (Band E), rising on an incremental scale in 2025 and 2030, there is currently no such demand on private sales – by far the biggest sub-sector - and the fact that homeowners have traditionally moved house every 15-20 years [Ref [How often do we move house in Britain? - Zoopla](#)] meant that although they weren't in the dwelling long enough to see the payback of energy efficiency measures, if did little if any increase in value if they did carry them out.

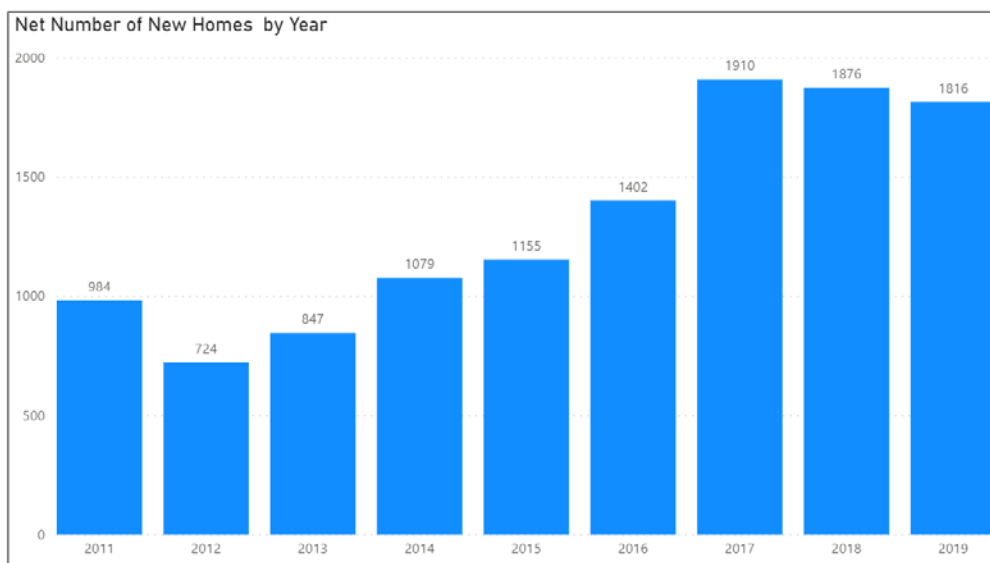
In the year to 30 September 2019 there were just over 5,300 house sales in Shropshire (5% of owned stock), suggesting owners are currently moving every 20 years – a stat borne out by research by the property experts This clearly gives time for the benefits of energy improvements to 'pay back any investment particularly in a era of low interest rates.

Government initiatives such as the [Green Homes Grant](#) scheme, which can help pay for insulation, double glazing, heat pumps and more, will help subsidise home energy improvements, but does not go nearly far enough to approach the kind of performance required to approach zero carbon. Added to this energy saving does not necessarily mean low carbon: for instance, insulants can be fossil-derived (e.g. Expanded Polystyrene - EPS) or high embodied carbon, such as mineral wool, so the effects of their manufacture are in the atmosphere long before they are even used.

<http://www.superhomes.org.uk/resources/whats-best-insulation-material/#What%20is%20the%20best%20insulation%20for%20health%20and%20climate?>

New dwellings

Construction of new homes in Shropshire is currently adding about 1.3% to the existing stock annually (1816 built in 2019) so is on the face of it fairly insignificant. However, government targets, funding and incentives should see this rise sharply from 2021. Shropshire Council's own targets are somewhat lower: in Summer 2020 the Council were consulting on the [full draft version](#) of the Local Plan for the period 2016-2038. Over the 22 year plan period around 30,800 dwellings are proposed, equivalent to around 1,400 dwellings per year for the whole of Shropshire – similar to 2016 levels.



The Government having abandoned zero carbon targets set for 2016 means that new housing is on the whole only adding to the burden: Building Regulations are i still woefully short of the standard required and volume housebuilders do not on the whole see any value in going beyond

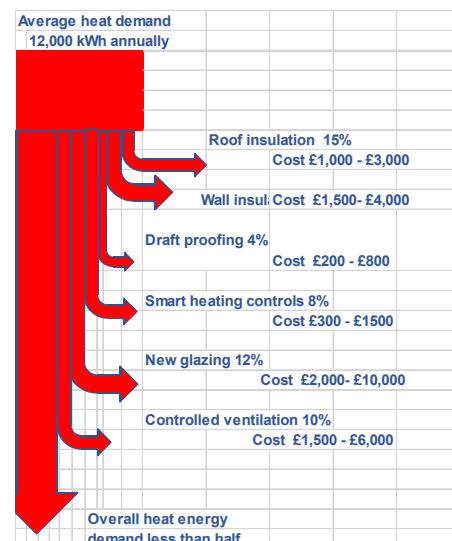
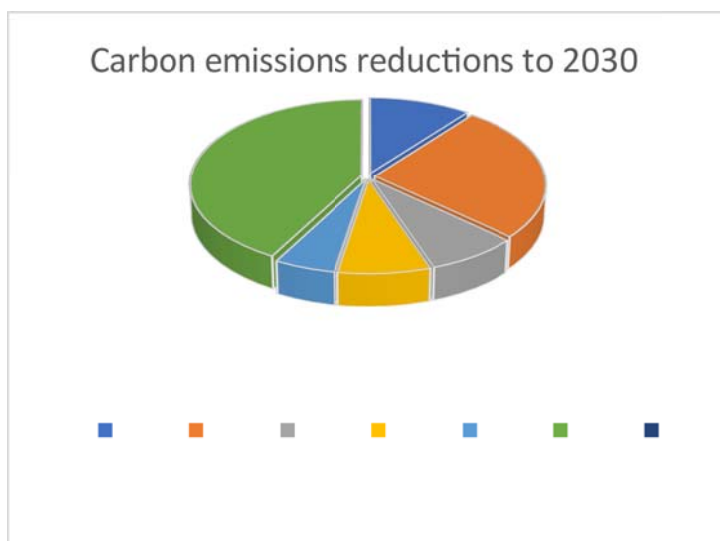
the minimum requirements, or just play lip service to 'green homes' with a few solar panels. The phrase is "greenwash"

There are signs of a turnaround though, with increased consumer demand for energy-efficient products, exemplar initiatives such as Homes England's *Home of 2030* competition and virtual events such as [HOMES UK 2020](#) all strengthen the case for the standards of new homes to rise.

A step change increases to the performance of existing houses being sold together with new property built to near zero carbon performance will provide the mechanism to decarbonise housing stock across the board. Change will come when public pressure demands it from both the house builders and from the Authorities.

B Potential Reductions

1. If all homes are upgraded to reach EPC A or B, then overall thermal energy reduction assessed as 25%
2. If balance of heat from non-fossil carbon reduction assessed as 37% at current carbon emission factors
3. Over the period of the Plan the carbon factor for electricity will reduce emissions by a further 57%



The series of energy reduction measures are considered as necessary for most homes in the following order of implementation.

- Roof insulation
- Cavity wall insulation
- Draughtproofing
- LED lighting
- Smart controls
- Double or triple glazing
- Controlled ventilation

The Plan currently requires an annual emissions reduction in the domestic sector of some 70,000 tCO₂ annually

Routes to non fossil fuel operations

The following technologies are well established with the exception of hydrogen as a home heating fuel but that is listed to reflect continuing development work, Other options, most significantly heat pumps, are mature technologies but are still continuing to offer steady incremental performance improvements.

- Air source heat pumps
- Ground source heat pumps
- Ground source heat pumps via shared heat networks
- Low carbon heat and energy networks
- Direct electric heating
- Hydrogen fuels
- Bio- mass fuels

Given that an average domestic property is assessed to consume 12,000 kWh gas, 2,030 kWh electricity then that property if insulated to halve heat demand and retrofitted with an air source heat pump would consume no gas and some 5,200 kWh electricity.

This would achieve an annual carbon reduction of 1,610 kgCO₂. (based on current carbon emission factors).

C. Timescales

Timelines are determined by:

1. Regulation, both national and regional
2. Site team ambition
3. Availability of expertise
4. Availability of funding

D. Funding mechanisms

Commercial finance, grants and loans are all available but earlier Government Given the potential return on investment this retrofitting can offer then it presents a sound investment in a time of historically low interest rates.

As part of the Zero Carbon Shropshire Plan it is proposed that a local Community Fund is established to provide funds to supplement any other available grant aid funding for private and institutional home owners.

F Impact on Fuel Poverty

G Barriers

1. Funding
2. Motivation
3. Skills

H References

The following further reading is suggested

www.se-2.co.uk/files/se2/casestudies/Carbon%20Management%20Strategy_As%20published.pdf

[isbl.org.uk/documents/132110.2911645PA%20Carbon%20Challenge%20Schools%20Leaflet\[195343\].pdf](http://isbl.org.uk/documents/132110.2911645PA%20Carbon%20Challenge%20Schools%20Leaflet[195343].pdf)

[UK Schools Carbon Footprinting Study \(se-ed.co.uk\)](http://UK Schools Carbon Footprinting Study (se-ed.co.uk))

www.telegraph.co.uk/education-and-careers/2020/11/03/schools-asked-go-zero-carbon-realistic-aim/

What is the potential reduction our homes can achieve?

If the identified reductions are achieved it would result in a reduction of **75,032** tonnes of CO₂ annually

This is what 1 tonne looks like

