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BRE Client Report

BRE Integrated Dwelling Level Housing Stock Modelling and Database for Rotherham Metropolitan Borough Council

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Executive summary

- Rotherham Metropolitan Borough Council commissioned BRE to undertake a series of modelling exercises on their housing stock which required BRE to produce an integrated stock model which includes Houses in Multiple Occupation (HMO), and tenure data provided by Rotherham Council. The BRE models also integrate Energy Performance Certificate (EPC)[1] data. As a result of this, 52,061 addresses have had their imputed energy characteristics replaced with observed characteristics from the EPC data for the purposes of the energy model. The use of this observed data will lead to more accurate energy models for these cases, which account for 44.1% of the total stock in Rotherham.

- This report describes the work and the results obtained from the integrated model and Housing Stock Condition Database (HSCD). The database is also provided to the council to enable them to obtain specific information whenever required.

- The detailed housing stock information provided in this report will facilitate the delivery of Rotherham Council's housing strategy and enable a targeted intervention approach to improving housing. In addition to this there are also several relevant government policies – the Housing Act 2004, Housing Strategy Policy, Local Authority Housing Statistics (LAHS) and the Energy Companies Obligation (ECO).

- The main aims of this work were to provide estimates of:

  - The percentage of dwellings meeting each of the key indicators[2] for Rotherham overall and broken down by tenure and then mapped by Census Output Area (COA) (private sector stock only)
  - Information relating to LAHS reporting for the private sector stock - category 1 hazards and Houses in Multiple Occupation (HMOs) as well as information on EPC ratings
  - Energy efficiency variables for the private sector stock (wall and loft insulation)
  - Energy planning variables (SimpleCO$_2$, energy and heat demand, energy and heat cost)
  - Improvement scenarios

- Rotherham Council also requested the following additional analysis:

  - Analysis of dwelling age data
  - Empty dwellings – including length of time vacant and geographical distribution
  - Assessment of private rented sector stock to assess the potential for discretionary licensing scheme

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[1] EPCs are an indication of how energy efficient a building is - with a rating from A (very efficient) to G (inefficient). They are required whenever a property is built, sold or rented.

[2] Presence of a HHSRS category 1 hazard, presence of a category 1 hazard for excess cold, presence of a category 1 hazard for falls, dwellings in disrepair, fuel poverty (10% and Low Income High Cost definitions), dwelling occupied by a low income household and SimpleSAP rating.

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- BRE Housing Stock Models were used to provide such estimates at dwelling level and focussing on private sector housing. The key indicators provide Rotherham with detailed information on the likely condition of the stock and the geographical distribution of properties of interest.

- A stock modelling approach has been developed and used by BRE for many years and the most recent 2017 models have been updated to make use of the results of the 2014 English Housing Survey (EHS)[3]. The models also make use of Experian and Ordnance Survey (OS) data. OS AddressBase Plus is used as a basis for the list of all dwellings in the authority and applying improved geo-modelling[4] is used to determine the dwelling type and floor area from OS Mastermap. The energy model that lies at the heart of the modelling process are based on the 2012 version of SAP, and the methods for imputing the inputs to this model incorporate information sources from additional sources. These include the age of postcodes (to improve dwelling age data) and data from Xoserve to determine whether the dwelling is on the gas network. These dwelling level models are used to estimate the likelihood of a particular dwelling meeting the criteria for each of the key indicators. These outputs can then be mapped to provide the authority with a geographical distribution of each of the key indicators which can then be used to target resources for improving the housing stock.

- Furthermore, Rotherham Metropolitan Borough Council provided additional sources of "local data", including empty dwellings, Tenancy Deposit Scheme, tenure, and HMO data. Energy Performance Certificate (EPC) data is also integrated by BRE. These data sets were then incorporated into the BRE Housing Stock Model to produce an integrated Housing Stock Condition Database (HSCD).

- The headline results are provided on the following page:

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[3] 2014 is the latest available data. Prior to the 2017 models EHS 2012 data was used.

[4] The OS data has been used to update a number of the model inputs – the main value of the OS data is the ability to determine the dwelling type with much greater confidence – see **Appendix B** for more information.

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Headline results for Rotherham

There are 118,035 dwellings in Rotherham, 61% are owner occupied, 16% private rented and 22% social rented.

11,570 dwellings in the private sector have category 1 Housing Health and Safety Rating System (HHSRS) hazards. This equates to 13% of properties. *See full results*

3,019 dwellings in the private rented sector have category 1 HHSRS hazards. This equates to 16% of properties in the private rented sector. *See full results*

The highest concentrations of all HHSRS hazards in the private sector are found in the wards of Rotherham East, Rotherham West and Boston Castle. *See full results*

The highest concentrations of fuel poverty (Low Income High Costs definition) in the private sector are found in the wards of Rotherham East, Rotherham West and Wingfield and for excess cold the highest concentrations are in Dinnington, Boston Castle and Hoober. *See full results*

The average SimpleSAP rating for all private sector dwellings in Rotherham is 61, which is better than both England (60) and Yorkshire and The Humber (60). For owner occupied stock the figure is 61 and for private rented stock it is 61. *See full results*

Maps by Census Output Area (COA) have been provided for the above key indicators. *See maps*

The total cost of mitigating category 1 hazards in Rotherham's private sector stock is estimated to be £34.6 million – with £25.6 million in the owner occupied sector, and £9.0 million in the private rented sector. *See full results*

3.2% (2,912) of *private sector* dwellings and 4.2% (789) of *private rented* dwellings in Rotherham are estimated to have an EPC rating below band E. *See full results*

In the private sector stock, there are an estimated 18,352 dwellings with un-insulated cavity walls and 15,673 dwellings with less than 100mm of loft insulation. *See full results*

Analysis of the energy efficiency variables indicates that the private rented stock has the highest average figures for many variables (SimpleCO$_2$, energy and heat demand, energy and heat cost). *See full results*

An improvement scenario involving a package of work with low cost measures, heating, double glazing, solid wall insulation and solar hot water provides high levels of savings – around a 29% reduction in energy demand. However, simply implementing low cost measures and heating would provide a reduction of around 17%. *See full results*

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Headline results for Rotherham – HMOs and licensing

There are an estimated 1,943 HMOs in Rotherham, of which approximately 170 would come under the mandatory licensing scheme. *See full results*

Additional HMO licensing

The data covering HHSRS hazards in the private rented stock shows that HMOs have slightly higher rates of category 1 hazards than non-HMOs. Furthermore, 14% of HMOs are estimated to be in disrepair compared to 10% in non-HMOs. *See full results*

Selective licensing

The current selective licensing scheme in Rotherham runs until the end of 2020 and covers all private rented properties in four designated areas; Dinnington, Eastwood, Maltby South East and Masbrough. There are also proposals for a selective licensing scheme to cover the areas of Thurcroft and Parkgate.

Private rented sector

Overall the percentage of dwellings in the private rented sector across Rotherham is 16% compared to the national average of 20%. 5 out of 21 wards in Rotherham have a percentage of private rented sector dwellings greater than the national average. These 5 wards all have areas within them which are included in the current selective licensing scheme. *See full results*

Property conditions in the private rented sector

Compared to the national averages for property condition indicators, all of the wards in Rotherham have either the same or higher levels for one or more of all hazards, fall hazards and disrepair.

At LSOA level there are 35 LSOAs that have more than 20% private rented stock. Of these, 17 are not covered by any current or proposed selective licensing schemes and many of these also have higher levels of properties in poor condition compared to the average for the Rotherham private rented stock. Furthermore, 8 of the 35 LSOAs have less than 50% of their stock covered by current or proposed selective licensing schemes. *See full results*

Deprivation

Four wards stand out as having higher levels of deprivation - Rotherham East ward 95% of dwellings are in the 20% of the most deprived LSOAs in England. For Valley ward the figure is 74%, for Wingfield ward it is 72% and Rotherham West ward is 70%. *See full results*

Migration

Rotherham has a relatively low level of international migration compared to the 10 largest cities in England. It is similar to Bradford and slightly higher than the levels in London and Sunderland. Looking at internal migration, Rotherham has the lowest level. *See full results*

Crime

Some of the areas with high incidence of ASB are not covered by current or proposed licensing schemes, for example in the Rotherham town area. *See full results*

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Key illustrations of headline results

- The table below shows the results for 7 of the key indicators in Rotherham compared to regional data and England (EHS 2014) - split into all stock and private sector stock. The data shows that the performance of the housing stock in Rotherham compared to the EHS England average is mixed, with Rotherham performing slightly better for all hazards and excess cold, but worse for falls, disrepair and fuel poverty (particularly the 10% definition) and low income households. Compared to the regional average the picture is slightly different with Rotherham performing similarly across most of the indicators except for all hazards, and excess cold where there are lower levels and low income households where there are higher levels compared to the regional averages.

Estimates of the percentage of dwellings meeting the key indicator criteria assessed by the housing stock models and database for all stock and private sector stock – Rotherham compared to the Yorkshire and The Humber and England (EHS 2014)

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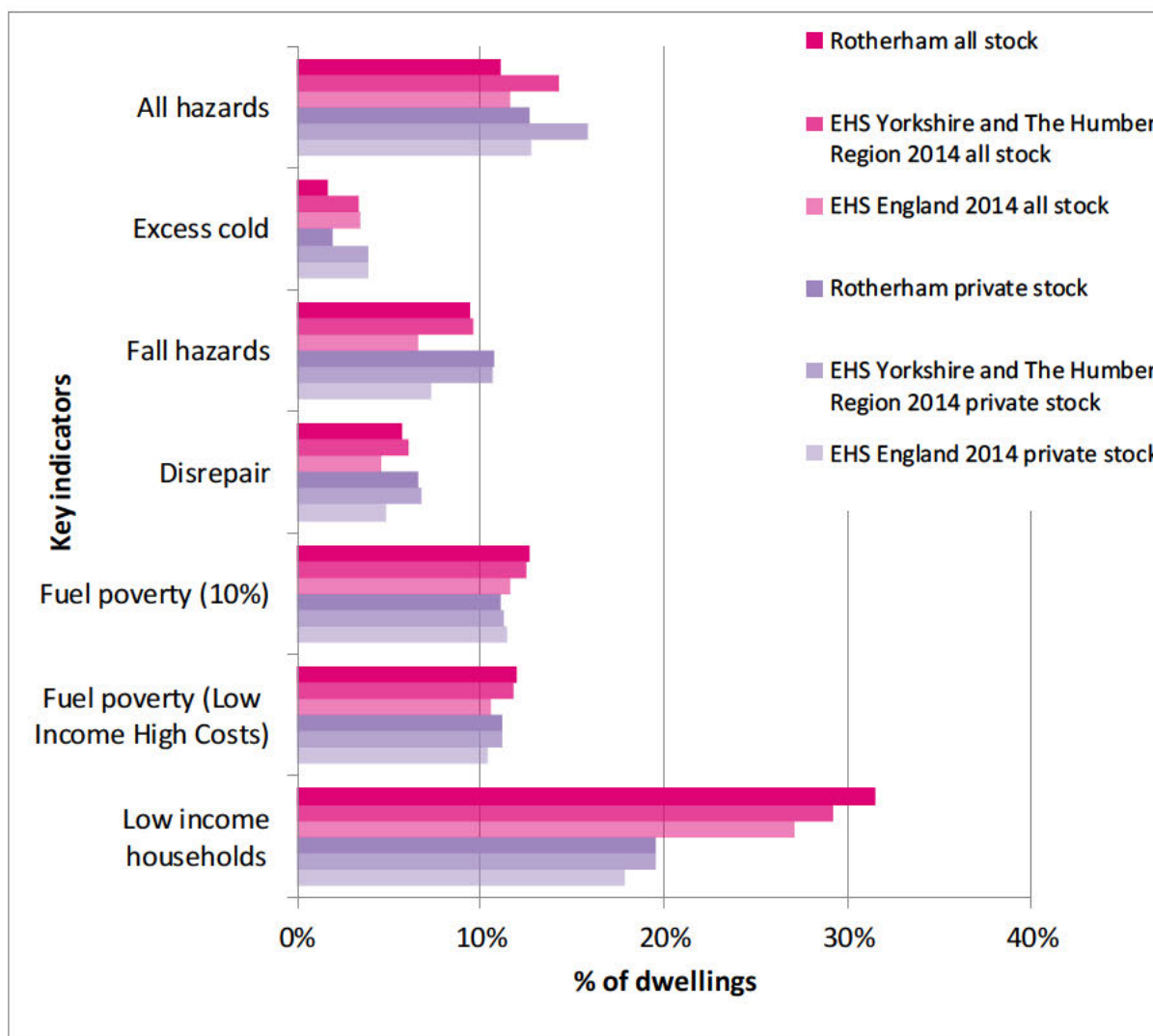
- The table below shows the number and percentage of Rotherham's private rented stock falling into each of the EPC ratings bands (based on SimpleSAP). The number of private rented dwellings in Rotherham with a rating below band E (i.e. bands F and G), is estimated to be 789 (4.2%). Compared to England, there are slightly greater proportions of dwellings in bands C and D and lower proportions in bands E to G.

Number and percentage of Rotherham's private rented stock falling into each of the EPC ratings bands (based on SimpleSAP)

	Rotherham		2014 EHS England
	Count	Percent	Percent
(92-100) A	0	0.0%	1.4%
(81-91) B	56	0.3%	
(69-80) C	4,563	24.1%	23.8%
(55-68) D	9,623	50.9%	48.9%
(39-54) E	3,890	20.6%	18.3%
(21-38) F	642	3.4%	5.4%
(1-20) G	147	0.8%	2.1%

- The map overleaf shows the distribution of category 1 hazards, as defined by the Housing Health and Safety Rating System (HHSRS). The highest concentrations are mainly towards the centre of the town of Rotherham, in particular the wards of Rotherham East, Rotherham West and Boston Castle.

![bre logo]

Percentage of private sector dwellings in Rotherham with the presence of a HHSRS category 1 hazard

Private Stock

HHSRS Cat. 1 Hazards

Percent and (no. of COAs)

	0 - 8 (197)
	9 - 14 (392)
	15 - 21 (190)
	22 - 33 (67)
	34 - 59 (8)

Ward ID	Ward
1	Anston and Woodsetts
2	Boston Castle
3	Brinsworth and Catcliffe
4	Dinnington
5	Hellaby
6	Holderness
7	Hoober
8	Keppel
9	Maltby
10	Rawmarsh
11	Rother Vale
12	Rotherham East
13	Rotherham West
14	Silverwood
15	Sitwell
16	Swinton
17	Valley
18	Wales
19	Wath
20	Wickersley
21	Wingfield