

BRE Client Report - SUMMARY

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

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Executive summary

- Watford 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 Local Land and Property Gazetteer (LLPG) data, Energy Performance Certificate (EPC)¹ data, benefits data, Houses in Multiple Occupation (HMO) data and other data relating to social housing, energy efficiency and dwelling age provided by Watford. As a result of this, 13,412 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 13,412 cases, which account for 35% of the total stock in Watford.
- This report describes the work and the results obtained from the integrated model and database. The database is also provided to the council to enable them to obtain specific information whenever required.
- Watford Borough Council have chosen to have annual updates of the BRE Model for 3 years, this being year 1.
- The council also commissioned BRE to carry out a Health Impact Assessment (HIA), the results of which are provided in a separate report.
- The detailed housing stock information provided in this report will facilitate the delivery of Watford's strategies 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 indicators² for Watford 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 (SimpleCO₂, energy and heat demand, energy and heat cost)
 - Improvement scenarios

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.



- BRE Housing Stock Models were used to provide such estimates at dwelling level and focussing on private sector housing. The key indicators provide Watford 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 2016 models have been updated to make use of the results of the 2012 English Housing Survey (EHS)³. The new models also make more use of Ordnance Survey (OS) data. OS Address Premium is used as a basis for the list of all dwellings in the authority, and applying improved geo-modelling⁴ 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 has been replaced with an updated model based on the 2012 version of SAP, and the methods for imputing the inputs to this model have also been upgraded, including the incorporation of some new information 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, Watford provided several additional sources of “local data” - Local Land and Property Gazetteer (LLPG) data, Energy Performance Certificate (EPC)⁵ data, benefits data, Houses in Multiple Occupation (HMO) data and other data relating to social housing, energy efficiency and dwelling age. These data sets were then incorporated into the BRE Housing Stock Model to produce an integrated housing stock database.
- The headline results are provided on the following page:

³ 2012 is the latest available data. Prior to the 2016 models EHS 2011 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.

⁵ 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.



Headline results for Watford

There are 39,157 dwellings in Watford, 56% are owner occupied, 28% private rented and 16% social rented.

5,055 dwellings in the private sector have category 1 Housing Health and Safety Rating System (HHSRS) hazards. This equates to 15% of properties. *See full results*

1,749 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 Vicarage, Callowland and Oxhey. *See full results*

The highest concentrations of fuel poverty (Low Income High Costs definition) in the private sector are found in the wards of Vicarage, Callowland and Meriden and for excess cold the highest concentrations are in Oxhey, Vicarage and Callowland. *See full results*

The average SimpleSAP rating for all private sector dwellings in Watford is 59, which is better than both England (57) and East of England (57). For owner occupied stock the figure is 57 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 Watford's private sector stock is estimated to be £12.17 million. *See full results*

There is an estimated total of 1,606 HMOs in Watford, of which approximately 120 come under the mandatory licensing scheme using the current definition. Using the proposed new mandatory licensing scheme definition, there are 253 HMOs *See full results*

4.3% (1,425) of *private sector* dwellings and 4.8% (531) of *private rented* dwellings in Watford are estimated to have an EPC rating below band E. *See full results*

In the private sector stock, there are an estimated 6,064 (18%) dwellings with un-insulated cavity walls and 5,060 (15%) dwellings with less than 100mm of loft insulation. *See full results*

Analysis of the energy planning variables indicates that the owner occupied stock has the highest average figures for SimpleCO₂ emissions, energy and heat demand, energy and heat cost. *See full results*

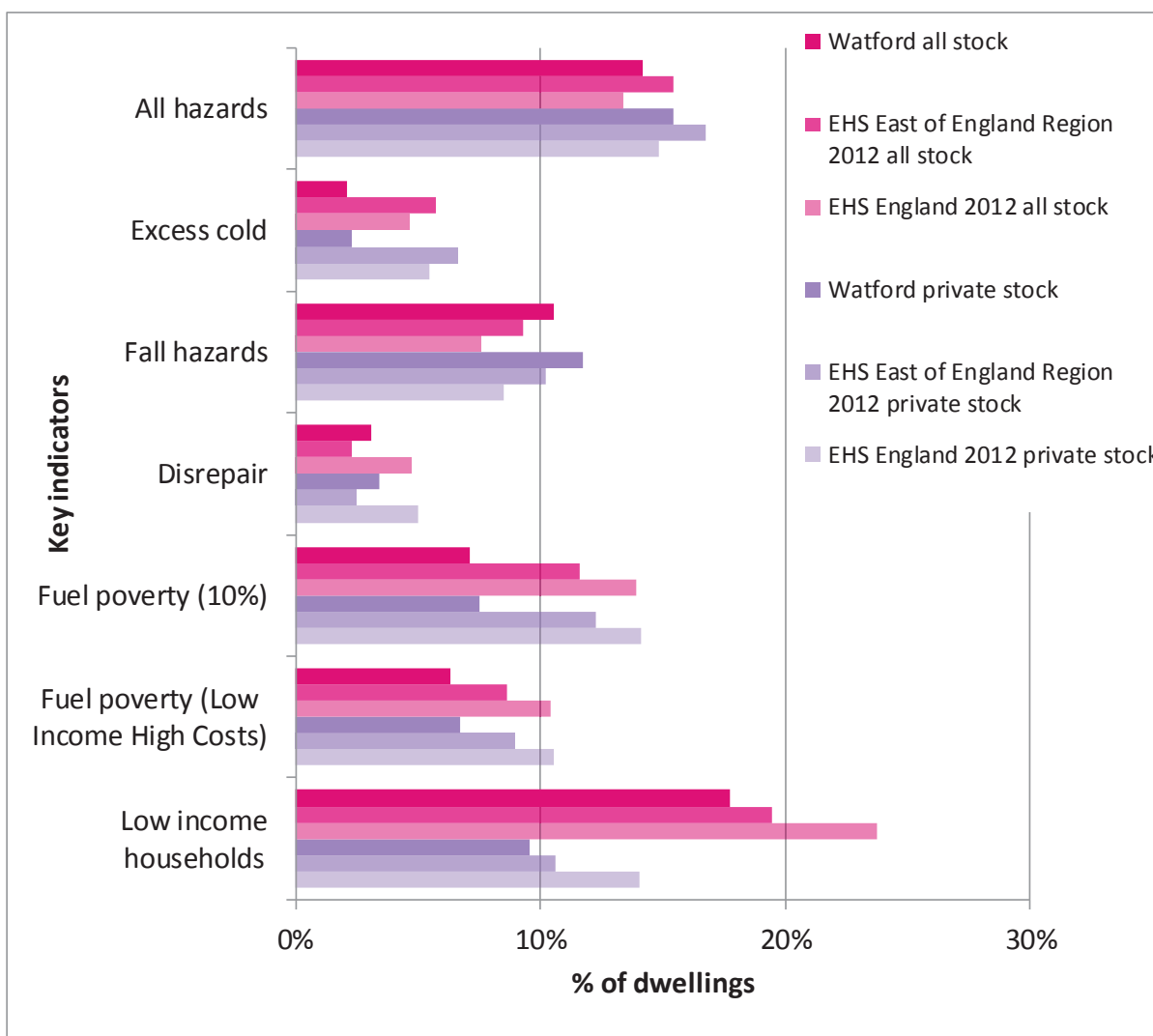
An improvement scenario involving a package of work with low cost measure, heating, double glazing, solid wall insulation and solar hot water provides high levels of savings – a 36% reduction in energy demand. However, simply implementing low cost measures and heating would provide a reduction of 17%. *See full results*



Key illustrations of headline results

- The table below shows the results for 7 of the key indicators in Watford compared to regional data and England (EHS 2012) - split into all stock and private sector stock. The data shows that the performance of the housing stock in Watford compared to the EHS England average is generally better for most indicators with the exception of all hazards and fall hazards where Watford performs worse. Compared to the regional average there is a similar picture with Watford also performing slightly worse for disrepair, but slightly better for all hazards.

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 – Watford compared to the East of England and England (EHS 2012)





- The table below shows the number and percentage of Watford's private rented stock falling into each of the EPC ratings bands (based on SimpleSAP). The number of private rented dwellings in Watford with a rating below band E (i.e. bands F and G), is estimated to be 531 (4.8%). Compared to England, there are a greater proportion of dwellings in bands A – C.

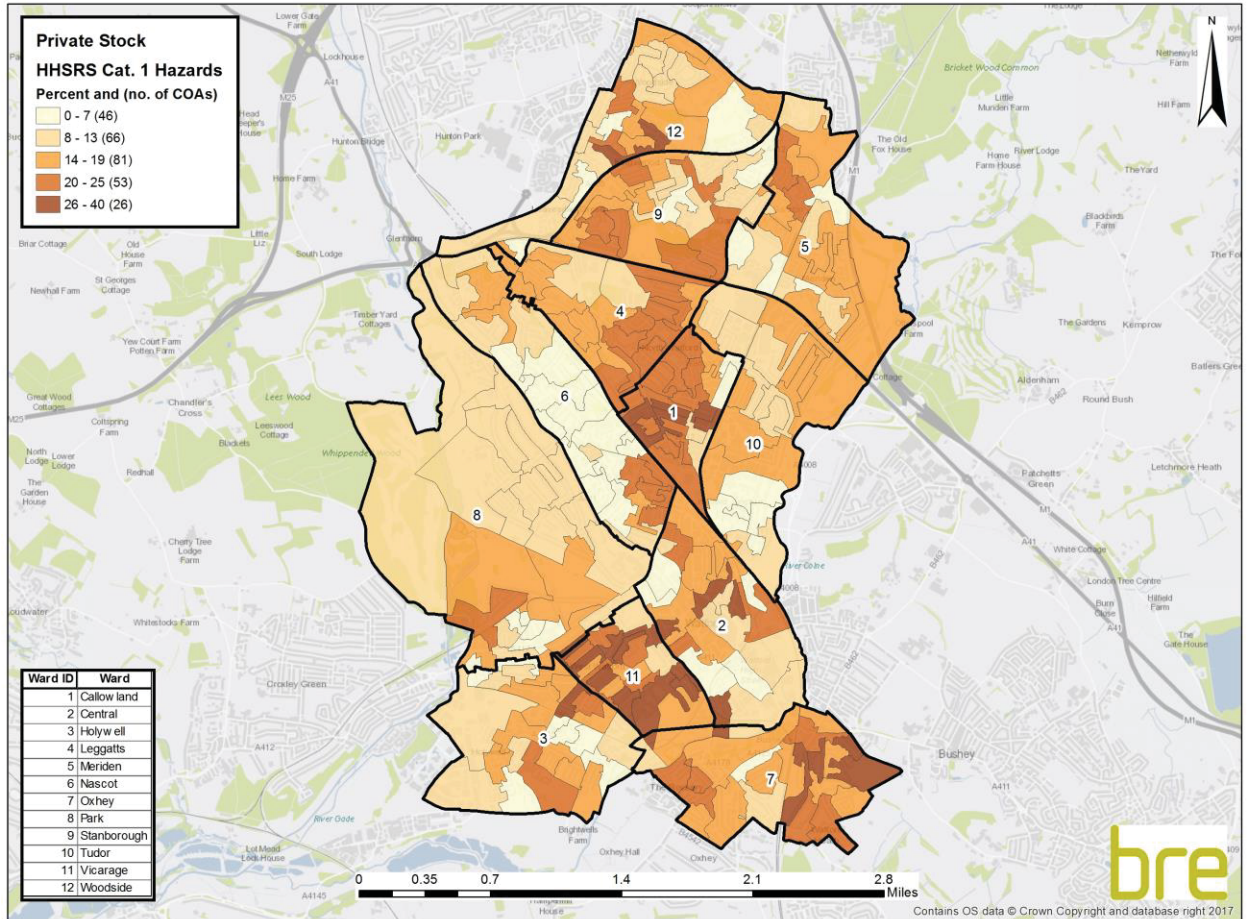
Number and percentage of Watford's private rented stock falling into each of the EPC ratings bands (based on SimpleSAP)

	Watford		2012 EHS England
	Count	Percent	Percent
(92-100) A	0	0.0%	1.0%
(81-91) B	159	1.4%	
(69-80) C	3,526	31.9%	18.9%
(55-68) D	4,254	38.5%	46.2%
(39-54) E	2,570	23.3%	24.5%
(21-38) F	456	4.1%	7.0%
(1-20) G	75	0.7%	2.5%

- The map overleaf shows the distribution of category 1 hazards, as defined by the Housing Health and Safety Rating System (HHSRS). The highest concentrations overall are in Vicarage, Callowland and Oxhey wards, although there are COAs in other wards with higher concentrations – for example in parts of Central and Woodside ward .



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



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