



BNXS33: Data dependencies in the assessment of energy consumption in UK housing

Version 1.1

This Briefing Note and referenced information is a public consultation document and will be used to inform Government decisions. The information and analysis form part of the Evidence Base created by Defra's Market Transformation Programme.

1 Summary

This Briefing Note provides an outline of the various data sources that are used in modelling the energy consumption of the housing stock, focusing in particular on a chart that summarises, in a simplified form, the dependencies that exist. More information about these data sources is also identified.

2 Introduction

Modelling the energy use of the housing stock involves referring to a wide variety of data. Some data are collected specifically for such modelling, some emerge from other modelling work, and some have more general application and are already being collected for other reasons (eg for the compilation of national statistics series). Information from the disparate sources can sometimes be compared and such cross-checking helps to provide added confidence in the modelling. The modelling itself is complex, involving interactions between end uses, and hence interactions between individual models.

The situation outlined above means that there are various data sources and programmes of work that effectively provide the pieces of an overall jigsaw, which the modelling work subsequently assembles. However, it is very difficult for anyone not heavily involved in the modelling process to understand how these pieces fit together. Such an understanding is important because it helps to avoid



unnecessary duplication (although the value of being able to check one source against another must be recognised, particularly where there are inherent uncertainties present) and, more importantly, it helps to avoid creating gaps in the jigsaw (eg through work programmes being modified such that certain information, possibly thought to be of lower priority, is no longer collected).

Considerations of the sort described above led to a request for a simple chart providing an overview of the principal data flows and cross checks, and also indicating the people and Government Departments that were involved. This briefing note is the result of that request.

3 The chart

The following chart illustrates the principal data flows and cross checks associated with energy use modelling for the housing stock. The chart is simplified in order to show the 'big picture' on one page, so it does not show every single data flow or every cross check that can be made. In addition, it does not show alternative approaches that have broadly the same aims, such as the Carbon Visions work that commenced in October 2004 and is due to continue to 2008, and with which there would in principle be a number of cross checks that could be made.

Further cross checks that can be made include comparison of the calculated energy use with data from the Expenditure and Food Survey. Also, as regards making projections, there are cross checks that ideally would need to be made against official projections (ie DTIs EP68 and any successors to this) and against information included in other Government publications, such as the "Energy Efficiency Action Plan". Perfect agreement with these sources would not be expected because of different modelling approaches (EP68, for example, is econometrically based) so the aim here would be to check that there is broad compatibility rather than an exact match.

The calculation of carbon emissions has not been shown on the chart but clearly there are also various considerations here about the emission factors to use. In particular, whether the emission factor for electricity should be that of the marginal plant or that associated with the mix of generating capacity actually in use (and what that mix is or could be in the future) is a question that has no simple answer. There are often good reasons why different studies use different values and one simply needs to be aware of such differences rather than being too categorical about what is right.

There are various issues about modelling housing stock energy use as illustrated in the chart that need to be kept in mind:

Geographical coverage



Some of the data identified on the chart relate to England, some to GB and some to the UK. Common sense assumptions have to be made in order to use these data together. Note that there are house-condition surveys in Scotland, Wales and Northern Ireland but the data collected is not completely comparable with the English House Condition Survey (EHCS) so it is currently impossible to combine all the data into one UK source. The result is that the EHCS tends to be used as the main condition survey reference and the results are generally assumed to apply to the whole of the UK (since England accounts for about 84% of the entire stock).

Timing

Data sources appear at different times. There is never a 'right time' to update everything.

Data revisions

Official statistics are often revised retrospectively. Ideally, past assessments should be re-done to take account of these, but this is rarely practical. Such revisions also create some problems in that official tables of statistics appear to present the same information (eg number of households) but often show different figures and it is then difficult to know which to use.

Model updating

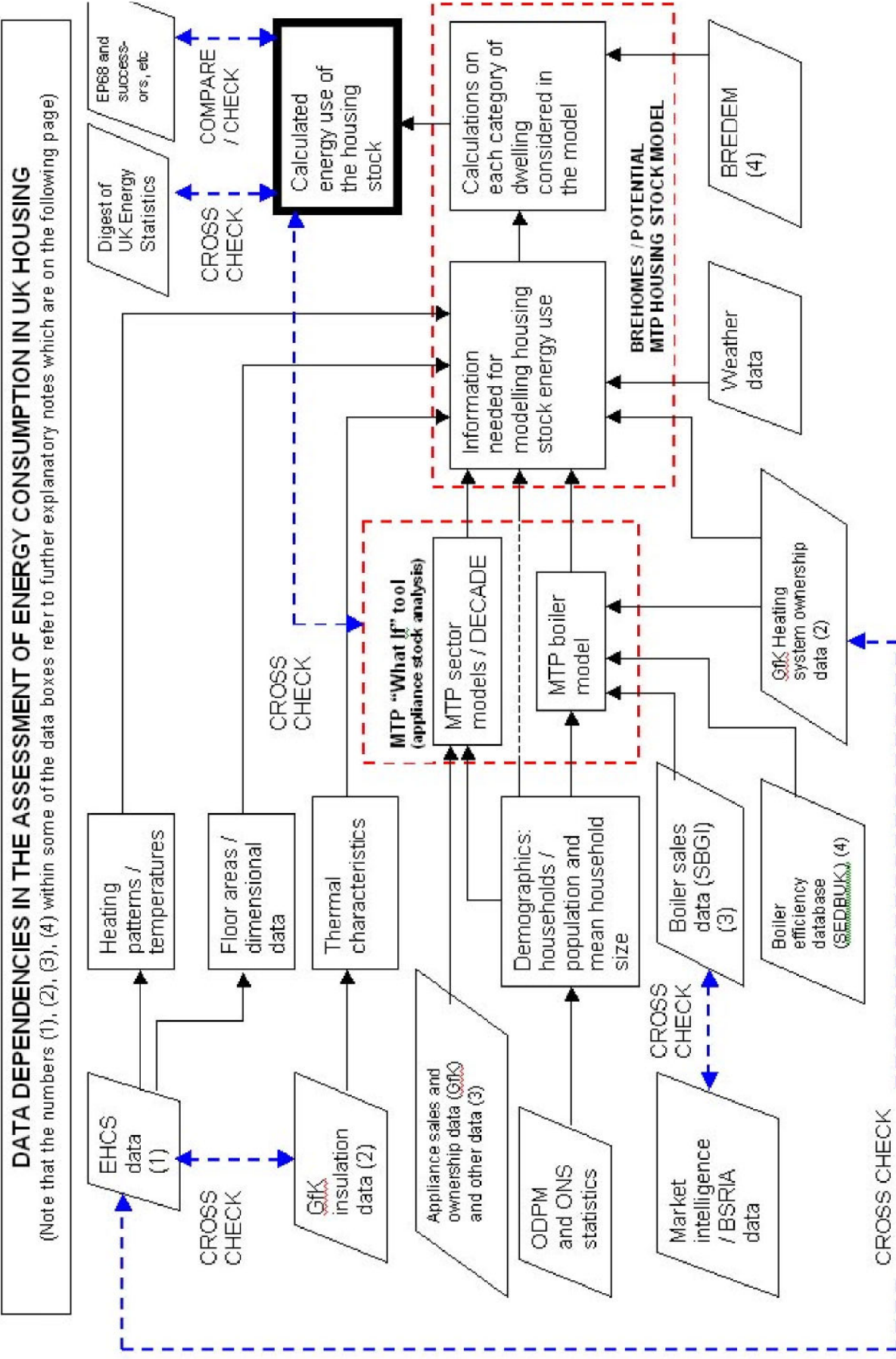
There are elements of the modelling procedures that are known to be in need of checking and updating. For example, hot water usage assumptions in BREDEM are based on old data and are thought to be in need of revising. Such revisions will be reviewed again after the results of a current monitoring programme, due to report in 2007.

Different programmes of work

The chart shows information drawn from various data sources and models. Note that these encompass several different programmes of work sponsored by many different parts of Government. The individual aims of each of these programmes of work may not always be compatible and priorities may differ. There is, therefore, always a danger that some important piece of information might 'fall through the cracks' because it is not perceived as being particularly important by the main sponsor (eg the EHCS is principally a DCLG-sponsored survey that is mainly concerned with the condition of the housing stock rather than with energy issues. Thus DCLG might, for example, regard information on heating patterns and temperatures as not a high priority. Departments with more interest in such data therefore need to strongly make the case to DCLG in order to ensure that the relevant survey questions are retained).

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Notes regarding work programmes that are the source of data or calculation tools, and the main individuals and Departments that are involved in these:

1. Work on the English House Condition Survey is principally sponsored by DCLG (Barbara Rose). Defra (Hunter Danskin and Pam Wynne) and DTI (Peter Matejic and Graham White) have particular interest in the energy related data (e.g. for fuel poverty analyses, etc) which is analysed by BRE (John Riley) through contracts managed by EST (Ken Double) on behalf of Defra and DTI.
2. GfK data on insulation and heating systems are collected as part of the BREHOMES work (this data forms the principal source for that model, although work is underway to assess whether the EHCS data could be used instead). This work is undertaken by BRE (Les Shorrocks) under a contract managed by EST (Ken Double) on behalf of Defra (Hunter Danskin). DTI (Julian Prime and Chris Bryant) also have an interest in the work as the data assists with the updating of DTI publications.

Scenarios are generated using BREHOMES under another programme of work for Defra (Jim Penman). This latter programme has another link with MTP in that it also includes work on establishing carbon emission factors. The steering group meetings for this work also involve other parts of Defra (Hunter Danskin) and DTI (Chris Bryant and Margaret Maier).
3. Appliance sales data etc is collected (contact Diana Goult at AEA Energy & Environment) as part of the MTP for Defra (Chris Baker). This data provides the basis for the MTP 'What If' tool. Under the same programme, sales data for the boiler model are collected by BRE (Bruce Young), this data being supplied by SBGI. EST and others also receive the boiler sales data (in a different format).
4. Work on BREDEM and the boiler efficiency database (SEDBUK) fall under a programme of work that also covers SAP, as well as issues to do with the EU Energy Performance of Buildings Directive and the Home Information Pack. This work is undertaken by various staff at BRE (overall programme management by Les Shorrocks) for Defra (Alan Christie). There are also strong links with DCLG interests through Building Regulations (Ted King) and the Home Information Pack (Andy Hannan).

Related MTP information

- All of the domestic sector Briefing Notes and the contents of the 'What-If' tool are in principle related to this Briefing Note because they determine key inputs that form an essential part of the modelling approach that has been outlined (i.e. they are represented by the red box in the centre of the chart on page 4).
- Of particular relevance are the domestic heating Briefing Notes BNDH12 and BNDH13 because these make direct use of the modelling approach that has been outlined in this Briefing Note.

Changes from version 1.0

Summary added and minor revisions made September 06. Version following proof reading reviewed December 06. Minor revisions made April 07. Reviewed September 07, December 07 and February 08.

Consultation and further information

Stakeholders are encouraged to review this document and provide suggestions that may improve the quality of information provided, email info@mtprog.com quoting the document reference, or call the MTP enquiry line on +44 (0) 845 600 8951.

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