Leeds
CITY COUNCIL

Domestic Energy Efficiency Report

For Leeds Housing Stock 2010

by Ivor Trueman
Fuelsavers, Energy Audit Coordinator

Jan 2011

Contents

1. Background
2. Private Sector SAP
3. Private Sector Fuel Poverty
4. Public Sector SAP
5. NI 187
6. Pseudo HECA % Energy Efficiency Improvement and CO_2 Savings

Appendices

A. Supporting Evidence for Private Sector Model
B. Public Sector Data Modelling
C. NI 187 Methodology
D. SAP Data Modelling

1. Background

Annual Domestic Energy Efficiency reports have previously been produced as part of statutory reporting to DEFRA under the "Home Energy Conservation Act" (HECA). Previous reports have been compiled by analysing data from a large scale private sector postal survey, combined with internal and external data provided by council departments, Warmfront, fuel utility companies etc.

As there is no longer a requirement to produce a HECA report [1], and as changes to available funding meant that postal survey costs would not be subsidised; it was decided to provide this basic report, with likely figures based on extrapolation of previous data.

The following is a summary of the results:-

	Current Value (Dec 2010)	Improvement
Average Private Sector SAP	56.3	+0.7
Average Public Sector SAP	69.9	+2.4
Private Sector Fuel Poverty	27%	-5%
Average Private Sector CO_2 emissions (NHER)	5189 (kg/yr)	n/a
Average Public Sector CO_2 emissions (NHER)	3874 (kg/yr)	n/a
Overall Energy Efficiency Improvement	3.43%	
Private Sector Energy Efficiency Improvement	2.63%	
Public Sector Energy Efficiency Improvement	7.97%	
NI 187 (SAP<35)	4.83%	(Target <4.89%)
NI 187 (SAP >=65)	43.80%	(Target >38.85%)

Future reporting on Energy Efficiency improvements will depend on the requirements of the new Coalition government. To date, they have said that future Statutory reporting requirements will be announced in 2011, and have indicated that there will be a revision to the definition of Fuel Poverty [2].

The new Green Deal initiative looks likely to include provision for Local Authorities to access the Energy Performance Certificate (EPC) database, although this may depend on whether they act as a "Green Deal Provider". Properties benefiting from the Green Deal scheme will have 'improved EPC'

[1] DEFRA did not call for the report in 2009 and the act is being repealed as part of the new Coalition "Energy Bill" legislation in December 2010.
[2] DECC have announced that the Fuel Poverty definition and target are to be subject to an independent review, to be started before the end of 2010.

data collected as part of the initial assessment of measures, and so will provide a very good source of Energy Efficiency information.

The Green Deal will be available to all tenures, with Local Authorities having the power to force private landlords with the least efficient properties (EPC band "F" or "G") to install energy efficiency improvements.

The future Leeds free insulation scheme / Leeds City Region DEEP will also provide other mechanism(s) for obtaining good quality data.

The EPC/Green Deal and other scheme data will provide a good basis for reporting on energy efficiency improvements in the future, although it may not in itself give information on Fuel Poverty.

The existing energy company obligations are also being replaced with a new Energy Company Obligation (ECO) focussed on "improving the ability of the vulnerable and those on lower incomes to heat their homes affordably" and improving 'expensive to treat' properties such as those with solid walls. According to a Local Government Association briefing[3] the ECO consists of a "Carbon Emissions Reduction Target" and a new "Home Heating Cost Reduction Target", with installed measures only counting against one of the ECO targets. Given that the fuel poverty is higher in solid wall and other expensive to treat properties, this may provide a future means of progress in reducing fuel poverty, providing that the data is published at Local Authority level.

Finally, future reporting may also be able to make use of the new "National Energy Efficiency Data Framework" (NEED) which DECC are developing as a statistical analysis tool.

2. Private Sector SAP

SAP (Standard Assessment Procedure) is a measure of the energy efficiency of a dwelling, taking into account the relative cost of heating fuels, with a rating between 1 and 100, where lower SAP values represent properties with low energy efficiency and higher running costs, and higher SAP values represent properties with lower running costs and higher energy efficiency.

On the current SAP 2005 scale[4], a SAP score of 100 represents a property which has a zero energy requirement, i.e. all it's energy needs are met by it's design and renewable energy generation technologies.

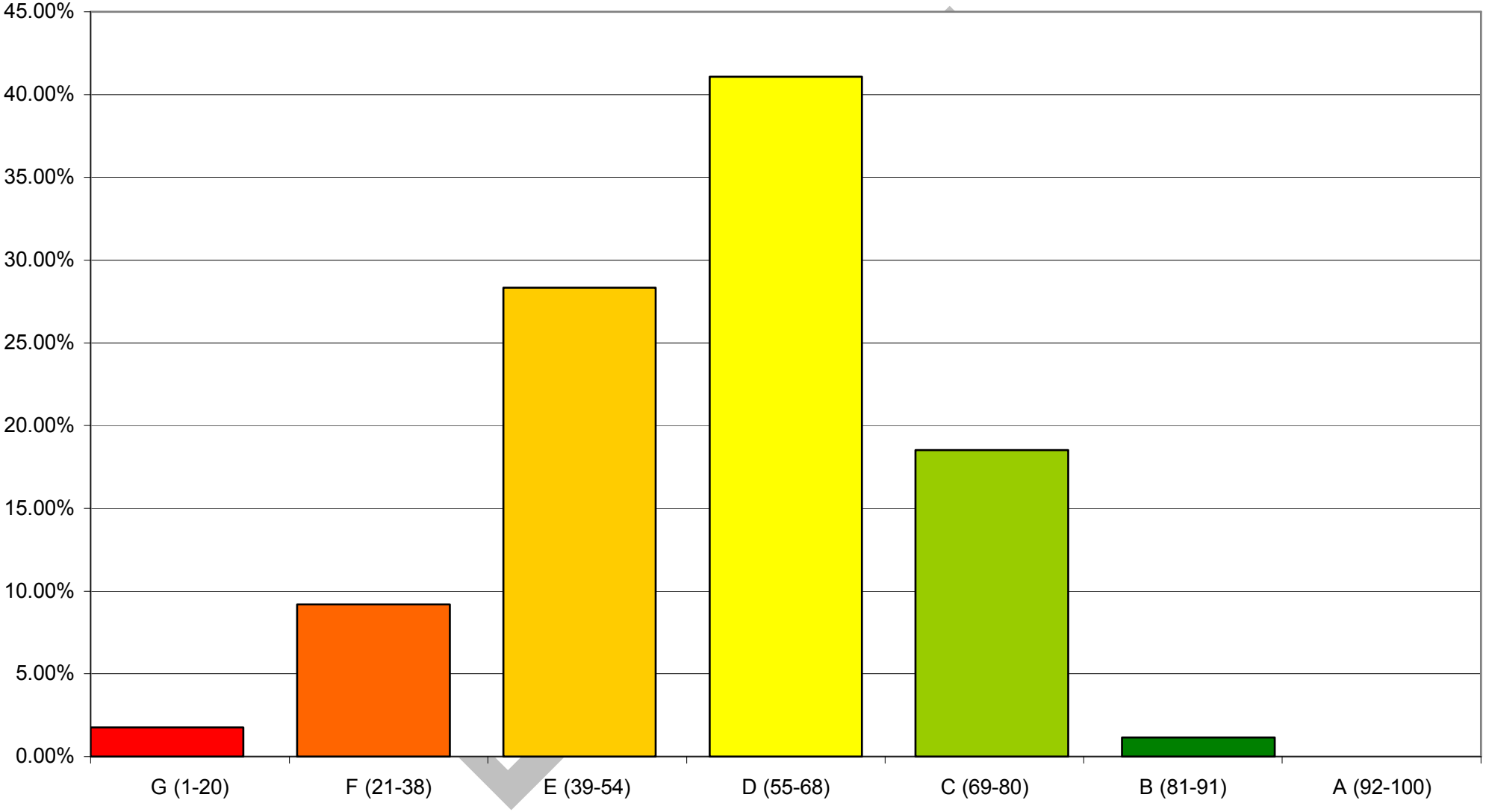
Modelling the likely take-up of insulation and heating improvements, and applying to the last HECA results suggests that the average private sector SAP for pre-1996 properties is 56.3.

[3] LGA Briefing on Energy Bill 20th December 2010.
[4] The methodology for SAP 2009 has been published but is not expected to be utilised in profiling existing stock until 2012.

This is an increase of +0.7 on the previous SAP calculated from the September 2009 survey (Average SAP 55.6).

It is also worth noting that the distribution of SAP values indicates a larger % of Band “F” (SAP 21-38) properties than reported in 2009, with an increase from 6.3% to 9.2%. This is due to differences in the SAP model used and does not indicate that there has been any actual deterioration in the housing stock.

Private Sector SAP



3. Private Sector Fuel Poverty

A household is deemed to be in Fuel Poverty if the cost of fuel is >=10% of the household income, assuming that the house is heated to an adequate standard and under typical weather conditions.

Private Sector Fuel Poverty has been modelled as approx. 27% compared to 22% in September 2009. This increase is due to fuel price increases in November and December 2010. If the figures had been calculated earlier in the year, the result would have been much closer to the 2009 value.

It should be noted that historically our Fuel Poverty figures have been higher than national data. The differences are partly due to the assumptions made – for example the National figures assume that under-occupied dwellings only need to be partially heated, and their fuel costs are taken as annual averages, rather than 'snapshot' values.

The definition of Fuel Poverty may be changed by the Coalition.

4. Public Sector SAP

SAP (Standard Assessment Procedure) is a measure of the energy efficiency of a dwelling, taking into account the relative cost of heating fuels, with a rating between 1 and 100, where lower SAP values represent properties with low energy efficiency and higher running costs, and higher SAP values represent properties with lower running costs and higher energy efficiency.

On the current SAP 2005 scale, a SAP score of 100 represents a property which has a zero energy requirement, i.e. all it's energy needs are met by it's own design and renewable energy generation technologies.

Modelling the insulation and heating improvements recorded in Keystone, and applying additional lighting and glazing data the average public sector SAP is 69.9.

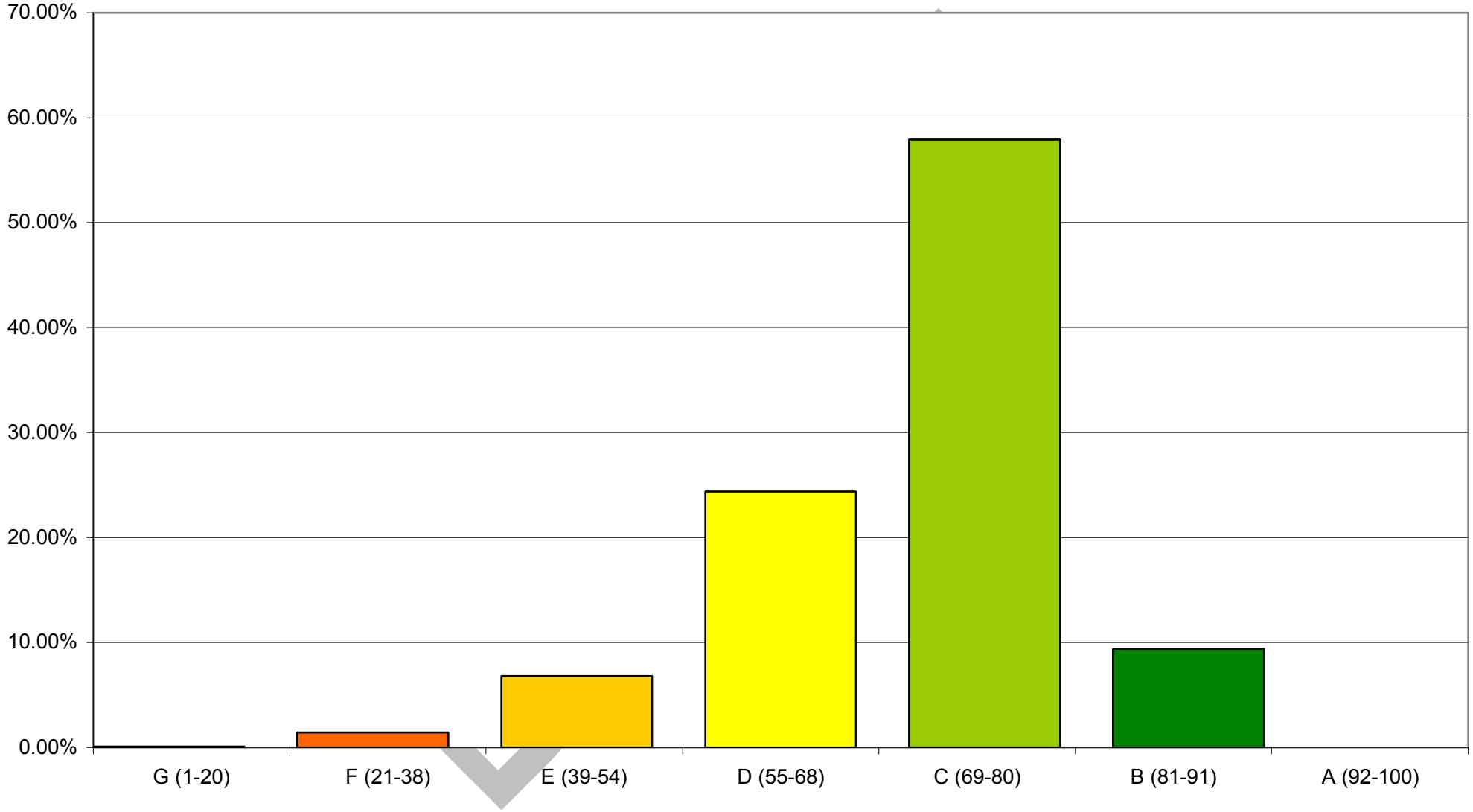
ALMO	SAP (Dec 2010)	SAP (Mar 2009)	Change
Aire Valley	70.7	69.5	+1.2
East North East	68.6	66.2	+2.4
West North West	70.3	67.7	+2.6
BITMO	70.7	69.6	+1.1
Swarcliffe	70.9	63.2	+7.7
City Wide	**69.9**	**67.6**	**+2.3**

This is an increase of +2.3 on the previous SAP calculated for the last KPI 63 Report (March 2009).

The calculated Average ALMO SAP of 69.9 is higher than the 69.1 average (end 10/11) reported on a Homes & Communities Agency "Decent Homes

Backlog Funding For Councils 2011-15" spreadsheet. Strategic Landlord have advised that the 69.1 figure was obtained using the old UNO data supplied by Fuelsavers, so the difference will be mainly due to the measures subsequently installed, plus gains from better modelling and omission of some secondary heating data in the original UNO database.

It is also worth noting that the distribution of SAP values indicates a slightly larger % of combined Band "F" and Band "G" (SAP 21-38 and 1-20) properties than reported in 2009, with an increase from 1.31% to 1.51%. This appears to be due to differences in the SAP model used and does not indicate that there has been any actual deterioration in the housing stock.


Public Sector SAP
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
G (1-20)
F (21-38)
E (39-54)
D (55-68)
C (69-80)
B (81-91)
A (92-100)

5. NI 187

Although the requirement to report NI 187 has been dropped[5] likely figures for 2010/11 have still been calculated, as targets for this final period were set and may still be required internally.

NI 187 figures consist of the percentage of benefit recipient households that:-

- Have a SAP <35
- Have a SAP>=65

The figures have been calculated using the modelled likely improvements to Private Sector SAP dataset and the Public Sector improvements modelled in the UNO 2010 program.

Baseline & Targets SAP >=65

Year	Target %	Rounded %	Target	Actual	Actual %	Benefit Households	Benefit Households SAP >=65
07/08	34.59%	35%	-	-	-	90596	31334
08/09	35.75%	36%	3800	4501	35.75%	100236	35134
09/10	38.12%	38%	3900	7195	38.73%	111093	42329
10/11	38.85%	39%	4000	6280	43.80%	112585	46329

Baseline & Targets SAP <35

Year	%	Rounded %	Target	Actual	Actual %	Benefit Households	Benefit Households SAP <35
07/08	7.90%	8%	-	-	-	90596	7156
08/09	6.64%	7%	500	506	6.63%	100236	6656
09/10	5.85%	6%	550	614	5.43%	111093	6042
10/11	4.89%	5%	600	602	4.83%	112585	5442

[5] The Secretary of State for Communities and Local Government, Eric Pickles, announced on 13th October that the suite of National Indicators (NI) are being replaced with “a single comprehensive list”, and that there is no longer a requirement to report NI 187 (Fuel Poverty) data.

6. Pseudo HECA % Energy Efficiency Improvement and CO_2 Savings

The average annual total energy requirement (Kwh/year) was calculated for the respective Public and Private sector databases used for the SAP calculations. Combining these with the approximate pre 1996 stock numbers from the last HECA report gives an approximate indicator of energy efficiency improvement:-

	Energy Efficiency Improvement
All Tenures	3.43%
Private Sector	2.63%
Public Sector	7.97%

Combined with previous HECA figures, this would give an overall improvement against the 1996 baseline of 30.5%.

CO2 Savings have been calculated using similar methodology:-

	Energy Efficiency Improvement
All Tenures	3.24%
Private Sector	2.45%
Public Sector	7.34%

Both Energy and CO_2 figures are taken from the NHER Total CO_2 (Kg/year) and Energy Requirement (Kwh/Year) , which include assumed energy usage for lights and appliances. Because of this, it is not possible to make direct comparison with previous figures. In addition, the CO_2 emission factors have been updated and there have been changes to the calculation methodology.

Appendix A – Supporting Evidence for Private Sector Model

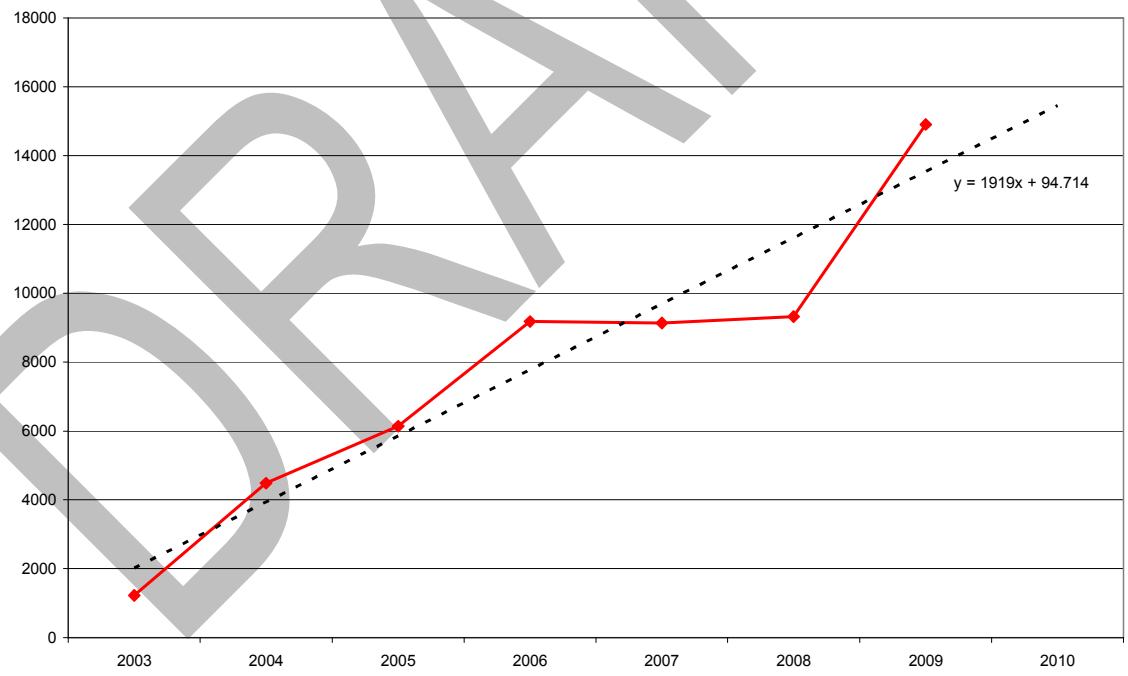
A.1 Extrapolated Measures

The reported take-up of measures was taken from recent HECA surveys and plotted to give an estimate for the number of measures installed in 2010/11.

The likely installed measures were then applied randomly to one of the data sample sets used in the previous HECA report, with a pro-rata reduction to account for the sample size. In previous HECA reports, several sample sets have been taken from the returned surveys, with each set being picked randomly to match the profile of the housing stock by tenure and by Ward/Council tax band. Results were then obtained by calculating average results across several data sets.

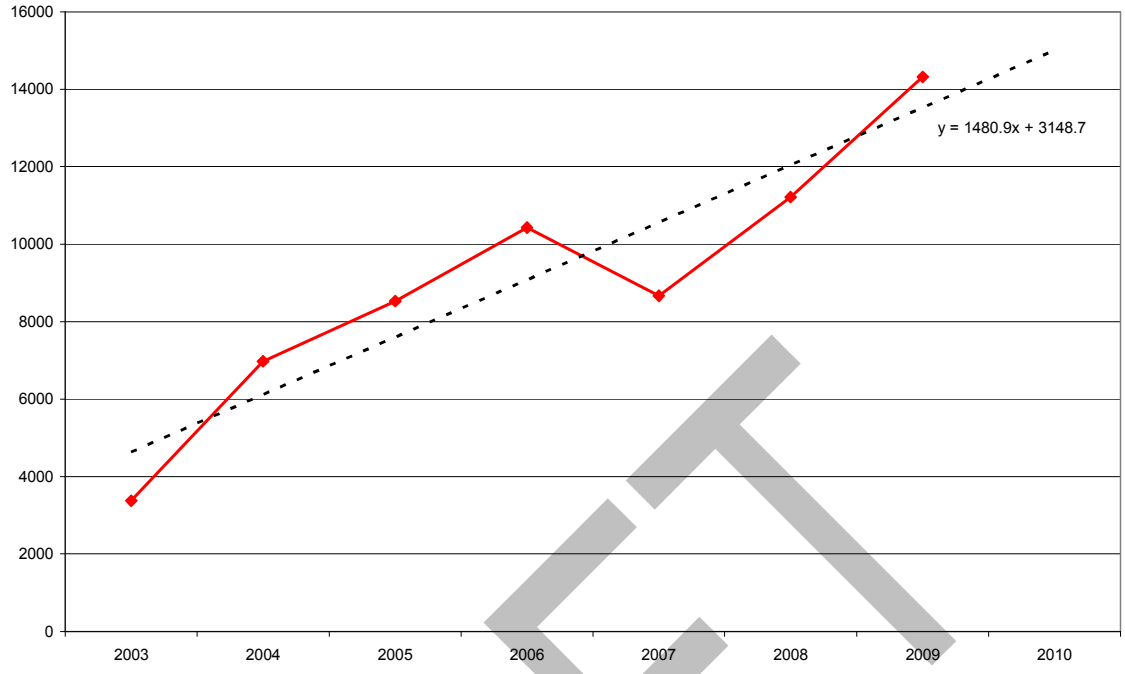
For this report one of the 2009 data sets was chosen, which had a mean SAP close to the average of all the sample sets, and the measures then applied randomly to give a likely improvement in the SAP data.

Reported / Extrapolated Cavity Wall installations:-



Cavity Wall and Loft Insulation installations have shown a reasonable correlation with the availability of Utility subsidy under the Governments EEC/CERT funding regimes.

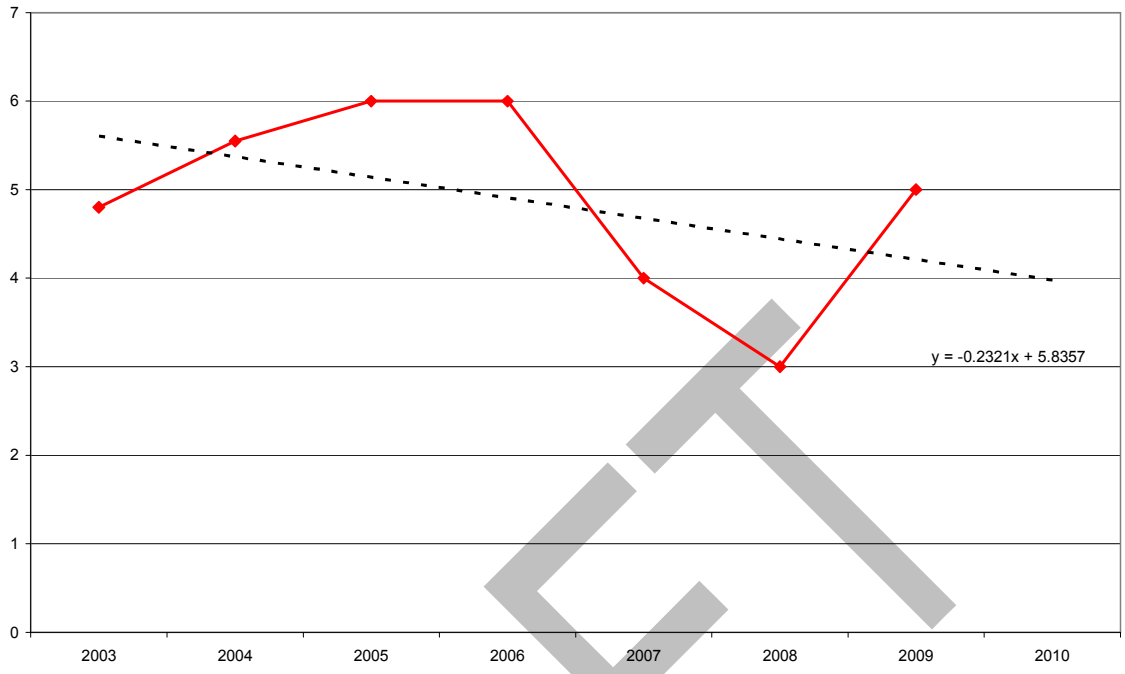
Reported / Extrapolated Loft Insulation installations:-



Reported/Extrapolated Households installing Double Glazing:-

The fall in new Double Glazing presumably shows that the market is fairly mature.

Reported/Extrapolated Number of Windows being Replaced per Household:-



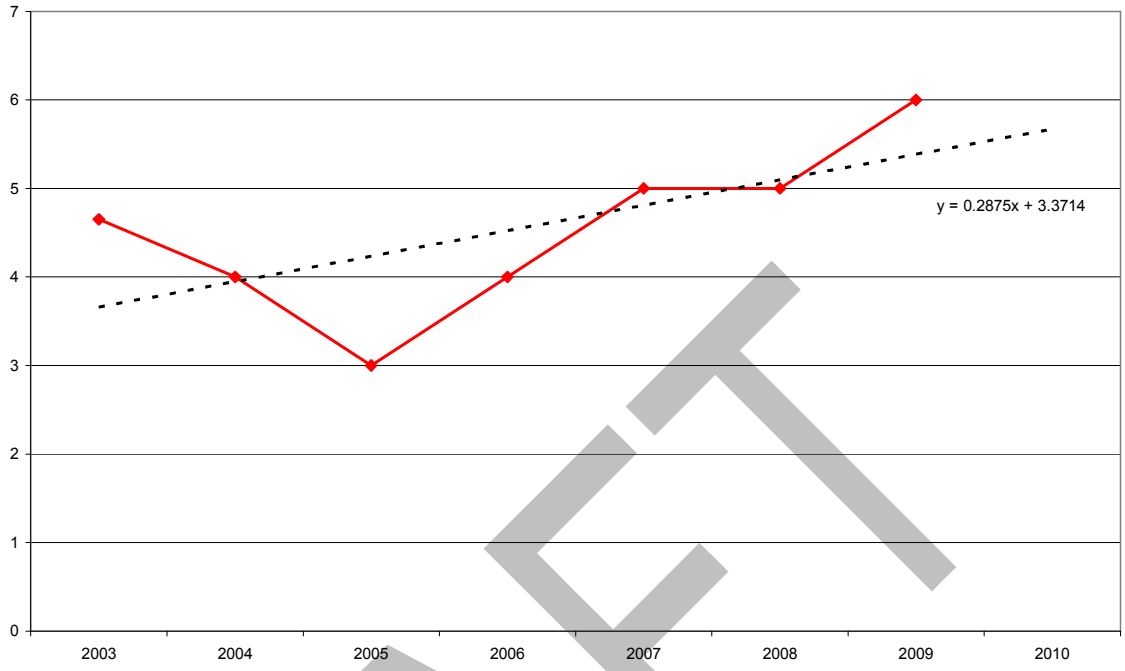
Reported/Extrapolated Households installing Floor insulation:-

Reported/Extrapolated Households installing/upgrading Central Heating:-

Central Heating upgrades and installations appear to be relatively constant, which is consistent with an item which is usually only replaced when it breaks down.

Reported/Extrapolated Households installing Low Energy Lights:-

Reported/Extrapolated Number of Low Energy Lights being Replaced per Household:-



The drop in Households fitting new Low Energy lights, would indicate that the market is relatively mature, and reflects the longer life span of the lights. It also might be affected by the removal of free low energy lights from CERT eligibility.

A.2 Warmfront

For HECA reporting, most data was presented for the previous financial year, e.g. the 13th Report produced circa Sept 09 presented Warmfront data for April 08 – Mar 09.

The corresponding summary of measures data provided by Warmfront (April 09 – Mar 10) shows that 2,587 Leeds households were assisted, compared with 4,201 households in 08/09 and 4,634 in 07/08.

The fall-off in installed measures has previously been shown to have occurred across Yorkshire & Humber as a whole, whilst referrals to the scheme have been consistent from year to year.

The Warmfront scheme closed to new applications on 15th Dec 2010 and will not re-open until 1st April 2011. The scheme will have reduced funding for 2011/12 and 2012/13, with revised 'tighter' eligibility criteria currently out for stakeholder consultation.

Leeds Warmfront Measures installed 09 - 10	Households	Percentage
Cavity Wall Insulation	359	13.88 %
CFL	2,544	98.34 %
Draughtproofing	260	10.05 %
Electric Storage Heating	88	3.40 %
Emergency Heaters	20	0.77 %
FIDIHWT (Foam Insulated Hot Water Tank Jacket)	7	0.27 %
Gas Central Heating	405	15.66 %
Gas Wall Heaters	9	0.35 %
Loft Insulation	498	19.25 %
Material Supply	1,780	68.81 %
New Gas Supply	23	0.89 %
Repair and Replacements	1,509	58.33 %
Tank Jackets	30	1.16 %
Total Households	**2,587**	

The reduction in Warmfront measures has not been included in the extrapolated Private Sector model, as the insulation measures installed on the scheme are small compared to those recorded from the HECA survey.

Similarly, whilst the Warmfront heating measures account for a greater proportion of the HECA survey measures, the decrease from the previous year (measured from Oct to Sept to account for the time of Survey), will be compensated for to some extent by the Governments Boiler Scrappage scheme.

Leeds Measures (Oct 08 - Sept 09)			
	Warmfront	HECA	Warmfront Contribution
Loft Insulation	688	14320	5%
Cavity Wall Insulation	507	14906	3%
Boiler Replacement	1415	15947	12%
Central Heating	483		

Leeds (Oct 09 - Sept 10)			
	Warmfront	HECA	Warmfront Contribution
Loft Insulation	166	14996	1%
Cavity Wall Insulation	77	15447	0%
Boiler Replacement	564	16083	6%
Central Heating	473		

A.3 CERT Data

The “Carbon Emission Reduction Target” (CERT) scheme is the current obligation on energy companies to install energy efficiency measures. CERT started on April 2008 and is due to run until Dec 2012, when it will be replaced by the Energy Company Obligation (ECO).

A summary of CERT installations by local authority has been published by the Energy Saving Trust for 08/09 and 09/10. After compensating for the likely Data Gap, (using their national data gap figures) this shows a 13% drop in Cavity Wall installations and a 19% drop in Loft insulation between 08/09 and 09/10.

	08/09	09/10
Cavity Wall	12629	9674
Data Gap %	4.0	15.6

Likely Installs	13,155	11,462

	08/09	09/10
Loft Insulation	8898	5815
Data Gap %	2.4	21.1

Likely Installs	9,117	7,370

The published CERT data contains both Public and Private sector installation data, but in Leeds there were delays in obtaining CERT funding for ALMO work, and it is difficult to know whether this has been included and if so, in what year.

The Data Gap figures are also national percentages, based on the discrepancy between the carbon savings claimed at Ofgem and the number of records in the Energy Saving Trust's HEED database. Guidance notes for the data state that gap varies regionally. Therefore, there is some uncertainty whether the same Data Gap will apply locally as nationally.

The CERT data also only includes professionally installed insulation measures, so DIY loft insulation is not included.

Given the above uncertainties it was decided not to make any modification to the extrapolated HECA measures used in the model.

Appendix B – Public Sector data Modelling

The last reported Average SAP value for ALMOs was reported in March 2009, as the requirement to report SAP had earlier been transferred to the ALMOs/Strategic Landlord in March 2008.

The Authority's new asset management system Keystone was expected to provide subsequent SAP reports.

To provide an updated SAP value, data was extracted from Keystone using an MS Access back end. Heating and Insulation data could then be applied to a UNO 2010 database to allow SAP values to be calculated.

Both Keystone and the UNO 2010 program use the NHER AutoAssessor engine for the SAP calculations, although it will still be possible to get discrepancies in SAP values from the two systems, depending on the level and accuracy of the data being used.

Not all of the available data was transferred from Keystone, as some information conflicted (e.g. Multipoint Water Heaters or Water Cylinder showing on records where Combi Boilers were recently installed; or cavity wall insulation showing as being fitted on old Solid Wall properties). Data was therefore added selectively, based on the apparent source and detail of information involved.

The original UNO data, which was used to generate the last reported SAP figure (67.6) did not have all of the Secondary Heating data that was available in Keystone. This data was used to produce the SAP of 69.1 using Keystone.

The calculated average of 69.9 is based on combining the best available data and with SAP values being generated for >98% of properties.

In addition to the selective inclusion of Keystone information, estimates for the percentage of Low Energy Lights and the extent of double glazing were taken from the EPC data that Fuelsavers had collected in 08/09 & 09/10 and applied to the model. (These parameters could not be modelled in the previous version of UNO, and provide an uplift to the SAP result, whereas the inclusion of better Secondary Heating data has the opposite effect).

Appendix C – NI 187 Methodology

The NI 187 indicator was a proxy indicator for fuel poverty with two components:-

- The % of benefit recipient households with a SAP rating <35
- The % of benefit recipient households with a SAP rating >=65

Previous improvement figures have been calculated using a subset of the annual energy survey responses, combined with the public sector UNO information.

To estimate figures for the final reporting period, the extrapolated private sector dataset was used where the householder had indicated they were in receipt of benefits, with and without the extrapolated measures from previous HECA surveys.

Similarly figures for the public sector data improvements were generated using the UNO 2010 program with and without the Keystone measures. (The low energy light and double glazing % were applied to both pre & post measures datasets).

Combining these gave the number of benefit recipient properties that were taken above SAP 35 or SAP 65, which were then used in the previous years spreadsheet.

It should be noted that the NI 187 indicator was a poor proxy for fuel poverty as about half of the fuel poor are not benefit recipients, and the NI 187 figures are also affected by the level of benefit recipients.

Appendix D – SAP Data Modelling

The Government's SAP (Standard Assessement Procedure) is an Energy Model which has been through 3 iterations; SAP 98, SAP 2001 and SAP 2005, with a further refinement SAP 2009 likely to be used for Stock Profiling circa 2012.

Previous SAP reporting has had to be produced using UNO which utilised the earlier SAP 2001 methodology which then had to be converted to SAP 2005.

The data presented in this report natively makes use of SAP 2005, with the same calculation engine (NHER AutoAssessor) as that (which will be) used by Keystone.

In addition to the scale and calculation methodology changes, SAP 2005 also has differences to the input variables including:-

- The addition of Back-to-Back terrace archetypes (previously only modelled as 'through' terraces) and the omission of "Mid-Terrace with passage".
- A change to the definition of 'Habitable' rooms, to bring it into line with RDSAP. (Kitchen, Bathroom and Hall's etc are no longer counted)
- A change to the how Flats and Maisonettes are recorded, with new details required for the dwelling position in the block and heat loss corridor details and with the 'No of Exposed Sides' being dropped from the calculation.
- The Addition of the proportion (%) of low energy lights
- The Addition of the proportion (%) of double glazing
- Better efficiencies for Heat Pump systems, and other renewable technologies.
- Improved modelling of properties with Room in Roof's
- Fixed depths assumed for wall insulation
- Ability to make use of higher level data, suitable for an EPC level survey.