Improvement schedule for SAP 9.92 – 9 May 2014

Note 8 revised 29 May 2014

NI high/further measures corrected 17 July 2014

Changes vis-à-vis RdSAP 9.91 shown in red.

Table of improvement measures

For England & Wales and Scotland software tests for the relevance of improvement measures, and applies them where relevant, in the order shown in this table.
Several heating measures apply when mains gas is not available. When mains gas is available they are substituted by a fuel switch recommendation (item T). A recommendation is actually made only if it increases the SAP rating by at least the threshold that has been defined for the measure concerned and in the case of items J, K and T also results in a cost saving of at least £10 when assessed using current fuel prices.(Note: the SAP value for each successive measure must be retained as a decimal number to avoid cumulative rounding errors.)

For Northern Ireland the sequence is:

1. Low-cost measures: A, B, C, D, E ,F, G, H
2. Higher cost measures: A2, A3, W1, X, Y, I, T2, J, K, L2, M, O3
3. Further measures: W2, N, O, P, Q, R, S, T, U, V2

and alternative measures are not considered.

In the case of new dwellings only items E, N, U and V2 are considered.

All applicable improvement measures are to be written to the XML so that they are included on the EPC. (Note: for an existing dwelling the user is able to de-select measures. That is not the case for new-build EPCs and the option to de-select measures should not be available in the case of new-build.)

The effect of each improvement measure is determined by implementing the measures in turn and calculating the results. The order of implementing the measures is to be as set out below. Implementing measures is done by amending the input data, e.g. to increase the percentage of low-energy lights to 100%, and the calculation is re-done.
The results for each measure consist of:
- the incremental cost saving in £/year from implementation of the measure
- the cumulative SAP band and SAP rating (i.e. after implementing all measures so far)
- ditto environmental impact

The total running costs, CO_2 emissions and primary energy are calculated after implementing all applicable measures. They are totalled separately for space heating, water heating and lighting. The electricity for pumps and fans together with any additional standing charge is included with the space heating, except for electricity for a solar water heating pump and for electric keep-hot by a keep-hot combi boiler which are included with the water heating.

The fuel prices to be used for the calculation of incremental savings and total running costs are those in Table 191 of the Product Characteristics Data File (pcdf2012.dat).
(Note: The prices in Table 191 are used only for calculation of costs and savings on EPCs. Any SAP rating, whether initial, after incremental improvements or final, must in all cases be based on the prices given in Table 12 of the published specification of SAP 2012. Thus software must maintain two sets of fuel prices, one set for calculation of SAP ratings and one set for calculation of running costs and savings.)

Item	Measure	To be considered when existing dwelling is/has:	Recommended if existing dwelling has:	Improve to:	Rec. number
A	Loft insulation	Pitched roof (slates or tiles), accessible loft, insulation at ceiling level, not thatched roof. Note: This does not include insulation of a room-in-roof which is included in A3.	<= 150 mm insulation or U-value entered by assessor >= 0.35	270 mm insulation. See Note 2 For a park home use R_{ins} = 1.5 m²K/W in Appendix S1.1.	5
A2	Flat roof insulation	Flat roof, not unknown insulation or Pitched roof with sloping ceiling, not unknown insulation	Roof insulation < 100 mm or roof U-value (entered or from RdSAP tables if as-built) > 0.4	Roof U-value = 0.18 For a park home use R_{ins} = 1.5 m²K/W in Appendix S1.1.	45
A3	Roof room insulation	Roof rooms, not thatched roof, as built age band <= F or insulated with U > 0.5	Any part of roof rooms with U-value (entered or from RdSAP tables if as-built) > 0.5	U-value of all elements of roof rooms with U > 0.5 have U = 0.18. See Note 13.	46
B	Cavity wall insulation	Unfilled cavity wall (assessed as "as built" and not "unknown")	Wall U-value (as entered by assessor or assumed from RdSAP tables) > 0.6	Cavity filled wall. U-value from RdSAP tables according to age of wall. See Note 3.	6
Q	Solid wall insulation	Solid wall (stone or brick) or park home wall, assessed as "as built" and not "unknown"	Wall U-value (as entered by assessor or assumed from RdSAP tables) > 0.6	Internal or external wall insulation with: E&W, NI: U-value 0.3. Scotland: U-value 0.22 For a park home use R_{ins} = 2.0 m²K/W in Appendix S1.1.2. See Note 7.	7
Q2	External insulation with cavity wall insulation ALTERNATIVE MEASURE, see note 11	Cavity wall	Cavity fill recommendation	For the walls recommended for cavity fill: E&W, NI: U-values 0.3 Scotland U-value 0.22	55

Item	Measure	To be considered when existing dwelling is/has:	Recommended if existing dwelling has:	Improve to:	Rec. number
W1	Floor insulation (suspended floor)	Below the building part there is: - ground, or - external air, or - unheated space and floor is suspended	Floor is - as-built, age band <= J, or - has retro-fitted insulation <= 50 mm or U > 0.5	Insulated floor with E&W, NI: U = 0.25 Scotland: U = 0.18 For a park home use R_{ins} = 1.5 m²K/W in Appendix S1.1.2.	57
W2	Floor insulation (solid ground floor)	Below the building part there is - ground and floor is solid	Floor is - as-built, age band <= J, or - has retro-fitted insulation <= 50 mm or U > 0.5	Insulated floor with: E&W, NI: U = 0.25 Scotland: U = 0.18	58
C	Hot water cylinder insulation	Cylinder present and accessible.	No cylinder insulation	80 mm jacket	1
			Factory-applied insulation <= 25 mm	Add 80 mm jacket. See Note 1a.	3
			Jacket < 80 mm	Add additional jacket. See Note 1b.	2
D	Draught proofing	Existing dwelling	Less than 100% draught proofing of windows and doors	100% draught proofing	10
E	Low energy lights	Existing dwelling	LEL < 100% of fixed outlets	LEL in all fixed outlets	35
		New dwelling	LEL < 75% of fixed outlets	LEL in all fixed outlets	35
F	Cylinder thermostat	Cylinder present and accessible	No cylinderstat (Note: cylinderstat is assumed for electric immersions)	Cylinderstat	4

Item	Measure	To be considered when existing dwelling is/has:	Recommended if existing dwelling has:	Improve to:	Rec. number
G	Heating controls for wet central heating system	Main heating by boiler with radiators	No controls	Roomstat, programmer and TRVs, interlocked system	11
			Programmer only	do.	12
			Roomstat only	do.	15
			Programmer, single roomstat (no TRVs)	do.	13
			TRVs (no roomstat or BEM), with or without programmer	do.	14
			Programmer and at least two roomstats	Time and temperature zone control	16
		Main heating by boiler with underfloor heating	Less than time and temperature zone control	Time and temperature zone control	16
		Main heating by heat pump with radiators or underfloor heating	Less than time and temperature zone control	Time and temperature zone control	16
H	Heating controls for warm air system	Main heating by mains gas or LPG warm air, or by heat pump	No control	Programmer and roomstat	17
			Programmer only	do.	18
J	Biomass boiler	Independent solid fuel boiler (not biomass or dual fuel)	Mains gas not available	Manual feed biomass boiler in heated space (wood logs) with radiators. See Note 8.	22
K	Biomass room heater with boiler	Solid fuel open fire with or without boiler (not biomass or dual fuel)	Mains gas not available	Wood pellet stove with radiators, summer immersion heater. See Note 8.	23
		Solid fuel room heater with or without boiler (not biomass or dual fuel)	Mains gas not available	Wood pellet stove with radiators, summer immersion heater. See Note 8.	39

Item	Measure	To be considered when existing dwelling is/has:	Recommended if existing dwelling has:	Improve to:	Rec. number
J2	Biomass boiler ALTERNATIVE MEASURE, see note 11	Heating other than by solid fuel or community	Heating system recommendation	Wood logs boiler with radiators. See Note 8	54
Z1	Air or ground source heat pump ALTERNATIVE MEASURE, see note 11	Heating other than by: - heat pump or - community or - wet underfloor system	Heating system recommendation	Air source heat pump and radiators. See Note 9	51
Z2	Air or ground source heat pump with underfloor heating ALTERNATIVE MEASURE, see note 11	Heating other than by: - heat pump or - community and wet underfloor system and Z1 not applicable	Heating system recommendation	Air source heat pump and underfloor heating. See Note 9	52
Z3	Micro-CHP ALTERNATIVE MEASURE, see note 11	Heating other than by micro-CHP or community and mains gas available	Heating system recommendation	Heating by micro-CHP. See Note 10	53
I	Upgrade boiler, same fuel	Main heating by mains gas boiler (including range cooker boiler) or CPSU or by LPG or oil boiler (including range cooker boiler) and mains gas not available Note. Not applicable to liquid biofuels.	Boiler, not condensing, hot water cylinder in dwelling	Condensing regular boiler, same fuel as original. See Note 4	20
			Boiler, not condensing, no hot water cylinder in dwelling	Condensing combi boiler, same fuel as original. See Note 4	20
			CPSU, not condensing	Condensing CPSU. See Note 5	36
			Range cooker boiler, hot water cylinder in dwelling	Condensing regular boiler, same fuel as original. See Note 4	37
			Range cooker boiler, no hot water cylinder in dwelling	Condensing combi boiler, same fuel as original. See Note 4	38

Item	Measure	To be considered when existing dwelling is/has:	Recommended if existing dwelling has:	Improve to:	Rec. number
R	Condensing oil boiler	Main heating by oil warm air	Mains gas not available, hot water cylinder in dwelling	Condensing regular oil boiler, radiators. See Note 4	28
			Mains gas not available, no hot water cylinder in dwelling	Condensing combi oil boiler, radiators. See Note 4	28
S	Change heating to condensing gas condensing boiler (no fuel switch)	Main heating by mains gas fires	Hot water cylinder in dwelling	Condensing regular mains gas boiler, radiators. See Note 4	40
			No hot water cylinder in dwelling	Condensing combi mains gas boiler, radiators. See Note 4	40
T	Change heating to condensing gas condensing boiler (fuel switch)	Main heating by: - solid mineral fuel boiler - LPG boiler (non-condensing) - oil boiler (non-condensing) - LPG fires - oil warm air - solid mineral fuel room heaters - oil room heaters - electric room heaters - electric ceiling heating Also if no space heating system present	Mains gas available, hot water cylinder in dwelling	Condensing regular mains gas boiler, radiators. See Note 4	29
			Mains gas available, no hot water cylinder in dwelling	Condensing combi mains gas boiler, radiators. See Note 4	29
		Main heating by: - electric storage heating - electric off-peak underfloor heating	Mains gas available, hot water cylinder in dwelling	Condensing regular mains gas boiler, radiators. Change electricity meter to single. See Note 4	27

Item	Measure	To be considered when existing dwelling is/has:	Recommended if existing dwelling has:	Improve to:	Rec. number
			Mains gas available, no hot water cylinder in dwelling	Condensing combi mains gas boiler, radiators. Change electricity meter to single. See Note 4	27
		Main heating by LPG CPSU	Mains gas available	Mains gas condensing CPSU	42
T2	Flue gas heat recovery	New or replacement gas boiler recommended (I, S or T)	Replacement boiler provides DHW	Add FGHRS, database index 694001 (if mains gas) or 694002 (if LPG)	50

Item	Measure	To be considered when existing dwelling is/has:	Recommended if existing dwelling has:	Improve to:	Rec. number
L2	New or replacement storage heaters	Main heating by storage heaters, Old (large volume) or Slimline	Mains gas not available, and hot-water heating by cylinder with single immersion, or from solid-fuel secondary heater	High heat retention storage heaters (409) and controls (2404), and dual immersion water heating, large cylinder with 50 mm factory-applied insulation. See Note 14.	59
			Mains gas not available, and any other hot water system	High heat retention storage heaters (409) and controls (2404). See Note 14.	60
		Main heating by: - electric room heaters - electric ceiling heating Also if no space heating system present	Mains gas not available, and hot-water heating by cylinder with single immersion or from solid-fuel secondary heater or no hot water system present	High heat retention storage heaters (409) and controls (2404), 7-hour off-peak tariff and dual immersion water heating, large cylinder with 50 mm factory-applied insulation. See Note 14. Secondary electric heaters (693) if no existing secondary	61
			Mains gas not available, and any other hot water system	High heat retention storage heaters (409) and controls (2404), 7-hour off-peak tariff. See Note 14. Secondary electric heaters (693) if no existing secondary	62
M	Replacement warm-air unit	Main heating by mains gas warm air	Non-condensing	New condensing warm-air unit, same fuel as original. See Note 15.	26
		Main heating by LPG warm air	Age before 1998	New (non-condensing) warm-air unit, same fuel as original, on-off control, fan-assisted flue	26

Item	Measure	To be considered when existing dwelling is/has:	Recommended if existing dwelling has:	Improve to:	Rec. number
N	Solar water heating	RdSAP assessment, house or bungalow, not thatched roof on main dwelling	No solar panel	Solar panel with parameters per Table S18. Increase a normal or unknown cylinder size to medium (see * below).	19
		SAP assessment, house or bungalow	No solar panel	Solar panel, 3 m² aperture area, evacuated tube with η=0.70, a_1=1.80, a_2 = 0.005, facing South, pitch 30°, modest overshading. Combined DHW cylinder at least 190 litres (see * below), solar part 75 litres; or if combi boiler, CPSU or instantaneous water heater, a separate solar pre-heat cylinder of 75 litres.	19
			All cases:	* Cylinder change not applicable to water heating by combi boiler or CPSU or heat pump or micro-CHP with integral DHW vessel or instantaneous water heater or community heating. In these cases add a separate solar cylinder of 75 litres. Cylinder has cylinderstat and 50 mm factory-applied insulation.	
Y	Waste water heat recovery	Dwelling has a mixer shower and no WWHRS	WWHRS not present	Add WWHRS for each shower. See Note 16.	49

Item	Measure	To be considered when existing dwelling is/has:	Recommended if existing dwelling has:	Improve to:	Rec. number
O	Double glazed windows	Single glazed windows present	Less than 80% of windows with multiple glazing	If all windows measured, all single glazed windows replaced by double glazing with U = 1.8 (roof windows) or U = 1.6 (other windows), and g = 0.63. Otherwise the windows with single glazing changed to double glazing with U = 1.6 and g = 0.63. See Note 12.	8
O3	Glazing replacement	Double glazing with PVC frames and 12 mm gap installed before 2002 (E&W) or 2003 (Scotland) or 2006 (Northern Ireland)	At least 80% of windows are of that type	Replace double glazed units with new units giving whole-window values of U = 1.6 and g = 0.74	56
P	Secondary glazing	Single glazing present but assessor de-selected measure O. See Note 6	Less than 80% of windows with multiple glazing	If all windows measured apply secondary glazing to single glazed windows with U = 2.6 (roof windows) or U = 2.4 (other windows) and g = 0.76. Otherwise the windows with single glazing are changed to secondary glazing with U = 2.4 and g = 0.76. See Note 12.	9
X	Insulated doors	House, bungalow or park home or (Flat or maisonette) and (no corridor or more than one door) i.e. door directly to outside	Door(s) directly to outside not insulated	Change doors directly to outside to insulated doors with U = 1.5	48
U	Photovoltaics	House or bungalow, not thatched roof	No photovoltaics	Photovoltaics, 2.5 kWp, facing South, pitch 30°, modest	34

Item	Measure	To be considered when existing dwelling is/has:	Recommended if existing dwelling has:	Improve to:	Rec. number
				overshading, connected to dwelling's electricity meter	
V2	Wind turbine	House or bungalow in rural location	No wind turbine	Wind turbine on mast, blade diameter 4.0 m, hub height 10 m above ridge	43

Note 1a : Improvement C, existing is factory applied <= 25 mm. SAP Table 2 is constructed on the basis that 80 mm jacket is equivalent to 25 mm factory-applied insulation. Therefore an additional 80 mm jacket can be implemented by increasing the existing insulation thickness by an additional 25 mm, to the nearest RdSAP thickness option for cylinders. Thus 12 mm improves to 38 mm, and 25 mm improves to 50 mm.

Note 1b : Improvement C, existing is jacket < 80 mm . 12 or 25 mm improves to 80 mm, and 38 or 50 mm improves to 120 mm.

Note 2 : Improvement A. Loft insulation is considered separately for main roof and extensions 1, 2, 3, 4 as applicable and applied to all accessible roofs with insulation <= 150 mm.

Note 3 : Improvement B. Cavity wall insulation is considered separately for main wall, extensions 1, 2, 3, 4 and alternative wall as applicable and applied to all fillable walls. When cavity fill is recommended the data collection includes whether there might be issues of cavity less than 50 mm, high exposure or difficulties of access. If any of those apply an addendum is included on the EPC saying that the issues should be investigated to establish the best treatment for the walls.

Note 4 : Improvements I, R, S, T. Use database boiler as follows:

Replacement boiler fuel and type	Boiler database index
mains gas regular	690001
mains gas combi	690002
LPG regular	690004
LPG combi	690005
oil regular	690006
oil combi	690007

Controls are:
- for radiator systems, programmer, roomstat and TRVs (or time and temperature zone control if already present), cylinder thermostat and separate timing of space and water heating (if regular boiler);
- for underfloor systems: time and temperature zone control.

Also:

- emitter temperature unknown
- if existing system is not a boiler, central heating pump age is 2013 or later
- in the case of measure I, leave cylinder as it is (but with cylinderstat and improved insulation if applied earlier in the sequence; if improvement N is also selected a larger cylinder may be substituted, see instructions in the table for N)
- in the case of measures R, S and T, if regular boiler, cylinder of at least normal size (no solar panel) or medium size (solar panel present) with 50 mm factory-applied insulation and cylinderstat (if improvement N is also selected a larger cylinder may be substituted, see instructions in the table for N).
- when there are two boilers, if main system 1 is being upgraded to a new boiler the new boiler does the water heating, unless main system 2 is also being upgraded to a new boiler (improvement I for both boilers) and the water heating was from main system 2 – in that case water heating stays with main system 2.

Note 5 : Improvement I from CPSU. Replacement is database boiler 690003 (mains gas) or 690005 (LPG)
Controls are programmer, roomstat and TRVs, interlocked system.
(690003 is a primary storage combi boiler. At present there are no condensing CPSUs available. The nearest equivalent is a condensing primary storage combi, which gives an almost identical rating to a condensing CPSU.)

Note 6 : Double glazed windows and secondary glazing. If 80% or less of the windows are single glazed, a recommendation should be made for double glazed windows replacing all single-glazed windows. If the assessor cancels this recommendation, a recommendation is made for secondary glazing for the single-glazed windows. The secondary glazing option should appear only in these circumstances.

Note 7 : Improvement Q. Solid wall insulation is considered for main wall, extensions 1, 2, 3 and 4 and alternative wall as applicable and applied to all applicable walls. Implemented by changing the wall insulation to external wall insulation but leaving the building dimensions (in the reduced data set) the same. This measure is not applied to system built or cob walls.

Note 8 : Improvements J, J2, K. Database boiler 691001 (wood logs) or 691002 (wood pellets).. Heating controls are programmer, room thermostat and TRVs. Hot water cylinder of at least medium size with 50 mm factory-applied insulation and cylinderstat, separate timing of water heating.

Note 9 : Improvements Z1, Z2. Use database heat pump as follows using the design heat loss of the dwelling allowing for any insulation measures already included:

Emitter	**Design heat loss**	**Boiler database index**
Radiators	< 3kW	693010
Radiators	3 – 8 kW	693011
Radiators	> 8 kW	693012
Underfloor	< 4 kW	693016

Underfloor	4 – 8 kW	693017
Underfloor	> 8 kW	693018

If the PSR is out of range cancel the recommendation. Heating controls are programmer and room thermostat. The hot water cylinder for these heat pumps is within the heat pump casing and replaces any existing one.

Note 10 : Improvement Z3. Database micro-CHP 692001 (mains gas). If the PSR is out of range cancel the recommendation. Heating controls are programmer and room thermostat. If DHW is not from main system, change it to main system. If no existing DHW cylinder add one of normal size (110 litres) with 50 mm factory insulation; Upgrade an existing hot water cylinder to at least normal size (no solar panel) or medium size (solar panel present) with 50 mm factory-applied insulation and cylinderstat.

Note 11: Alternative measures (Q2, J2, Z1, Z2, Z3). These are to be included in the XML (except for park homes) so that they can be mentioned on the EPC, subject to the selection conditions shown in the table for the measure and their attaining a cost saving (using current prices) of at least £10.

In the case of the heating alternatives (J2, Z1, Z2, Z3):

- implement each applicable alternative recommendation (in the case of heat pumps as an air source heat pump)
- if total costs are reduced by at least £10 mark it as a possible alternative recommendation
- remove amended heating system and proceed to next one
- finally check the effect of the heating upgrade for the main recommendation list, retain alternatives that meet the above criterion if the main heating upgrade is recommended; if not discard the alternatives as well

Note 12 : Improvements O, P. If there is already some multiple glazing, the double glazing or secondary glazing improvement is implemented by changing it to measured windows all with default orientation (E/W), window areas as previously assigned by RdSAP (Table S4 with ±25% if appropriate). Single glazed windows changed to above specification and other windows left as they are.

Note 13: Recommendations for roof rooms. Depending on the insulation of the roof rooms in the existing dwelling:

a. Unknown. No recommendation.
b. As built. Recommend if flat ceiling < 100 mm or other elements < 100 mm. Change all elements of roof rooms with U (from RdSAP Tables) > 0.5 to U = 0.18.
c. Flat ceiling only. Recommend if < 100 mm. Assume other parts of roof room are as built. Change all elements of roof rooms with U (from RdSAP Tables) > 0.5 to U = 0.18.
d. All elements. Recommend if flat ceiling < 100 mm or other elements < 100 mm. Change all elements of roof rooms with U (from RdSAP Tables) > 0.5 to U = 0.18.
e Roof room details (area and U-values). Recommend if any U-value > 0.5. Change all elements of roof rooms with U (entered) > 0.5 to U = 0.18.

Note 14 : Improvement L2. New storage heater is 697101.

Note 15 : Improvement M. Warm air system is 697001 (space only) or 697002 (space and water). If the existing cylinder is indicated as "no access" in the RdSAP data its size is re-assessed according to SAP Table S17. If the heating system being replaced was not providing water heating, the water heating arrangements remain as they are.

Note 16 : Improvement Y. Recommendation applicable only if hot water if from a cylinder or a combi boiler. If one shower it is System A. If more than one shower the first shower has System A and others System B, with System A is assigned to a room with shower and no bath, if there is one. For System A use 695001, for System B use 695002.

Heating upgrades

An improvement to a heating system by adoption of any of the following measures:

I, J, K, L2, M, R, S, T, J2, Z1, Z2, Z3

is taken as extending the main heating system to the whole dwelling where that is not the case in the existing dwelling. Thus when implementing any of the above measures, the number of heated habitable rooms is to be set equal to the number of habitable rooms. This rule affects the results where there are unheated habitable rooms and no identified secondary heater. If there is an identified secondary heater, the secondary heater remains throughout the sequence of calculations of improvement measures. Also, in the case of measure T upgrading storage heaters to a condensing gas boiler, if the secondary heating was (assumed) portable electric heaters the secondary heating becomes none after the upgrade.

In the case of measure T, if the existing heating is storage heaters or off-peak underfloor electric heating (401, 402, 404, 408, 409, 421, 422) change the electric meter to single.

Heating upgrades when there are two main systems

In the case of measure I (upgrade boiler, CPSU or range cooker, same fuel) where both systems each use the same fuel, apply the improvement to both boilers as applicable (i.e. boiler is non-condensing) as a single step. If the result attains the SAP increase criterion make the recommendation on the EPC using the improvement text applicable to main system 1 if both boilers are being upgraded.

In the case of any other combination of main heating systems, apply the improvement to system 1 only. This includes measure I where that is relevant to main system 1 but not main system 2, as well as consideration of measures J, K, M, R, S, T, J2, Z1, Z2, Z3 .

Heating control upgrades when there are two main systems

Apply the improvement to the controls on system 1 only, except apply improved controls to both boilers if both replaced.

Recommendation Status

For testing purposes only each improvement mentioned in the list can be indicated as being one of the following: Only those with status "Recommended" or "Alternative" appear on the EPC.

Status	**Meaning**	**Example**
Not considered	Measure not considered in this case	Insulation measure for new dwelling
Not applicable	Inapplicable in this case	Loft insulation for ground or mid-floor flat
Existing unknown	Existing condition not known	Cylinder insulation when cylinder inaccessible
Already installed	Dwelling already has measure to at least that recommended in the above Table of measures	Originally clear cavity walls but cavity has been filled
Equivalent already installed	Dwelling already has equivalent measure to at least that recommended in the above Table of measures	Cavity wall is unfilled but has internal or external insulation to give U <= 0.6.
Error	Incompatible data	Solid wall marked as having cavity fill
Recommended	Included in the quantified recommendations on the EPC	Increase insulation of hot-water cylinder
Alternative	Recommended as alternative measure	Heat pump
Superseded	A measure further down the list applies instead	Upgrade oil boiler to condensing oil boiler, but mains gas is available so instead the recommendation is for a condensing gas boiler
SAP increase too small	SAP improvement is less than the applicable threshold for the measure	100% low energy lighting raises SAP by 0.3 point
Cost saving too small	Total energy cost reduction is less than £10 when re-calculated using current fuel prices	Increase in SAP rating is 1.1 points but total energy cost increases (because of differential price changes since the values in SAP Table 12 were set)
Recommendation cancelled	Assessor deselected the recommendation	PVs when roof significantly overshaded