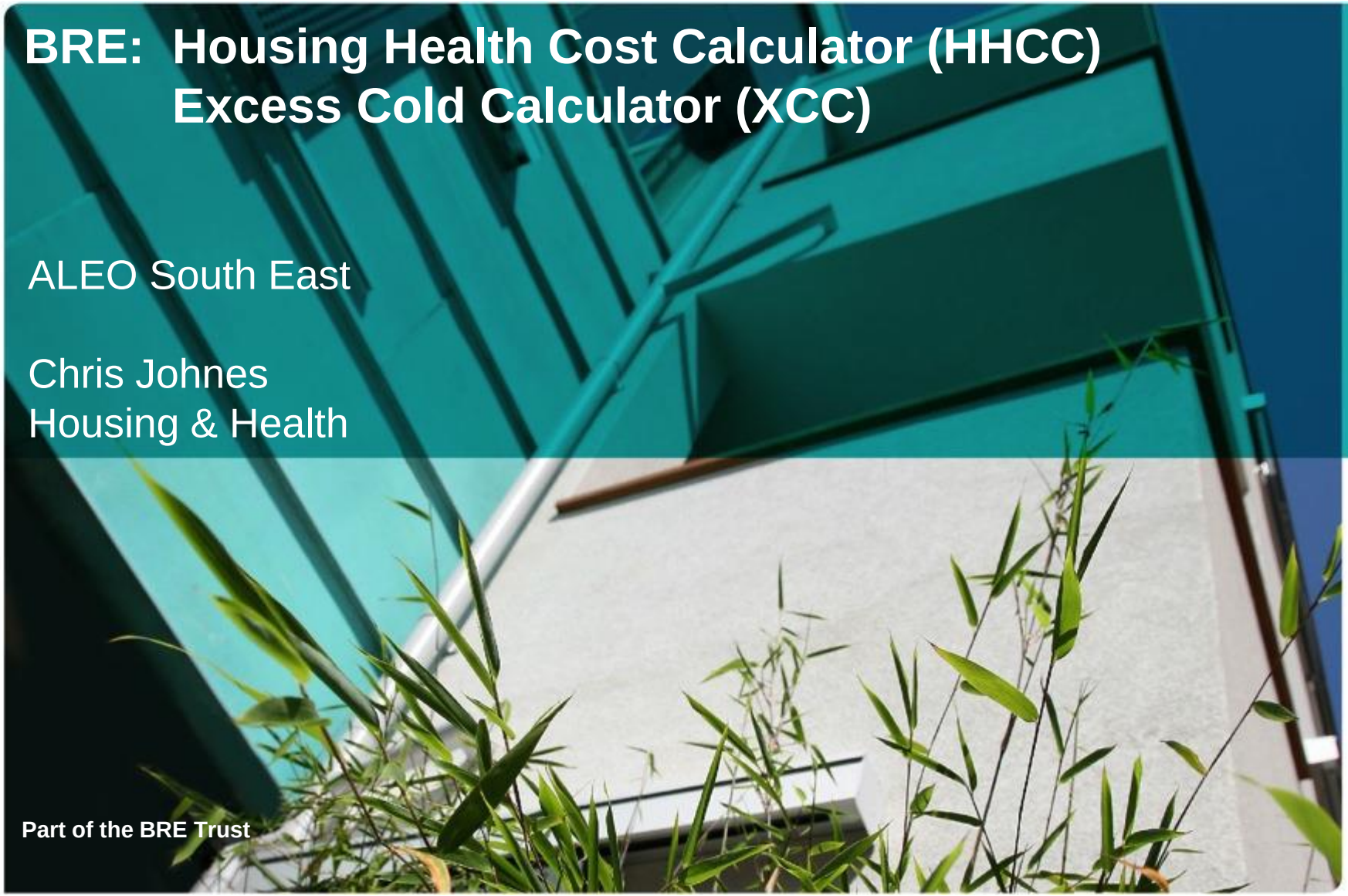
BRE: Housing Health Cost Calculator (HHCC) Excess Cold Calculator (XCC)

ALEO South East

Chris Johnes
Housing & Health



Part of the BRE Trust

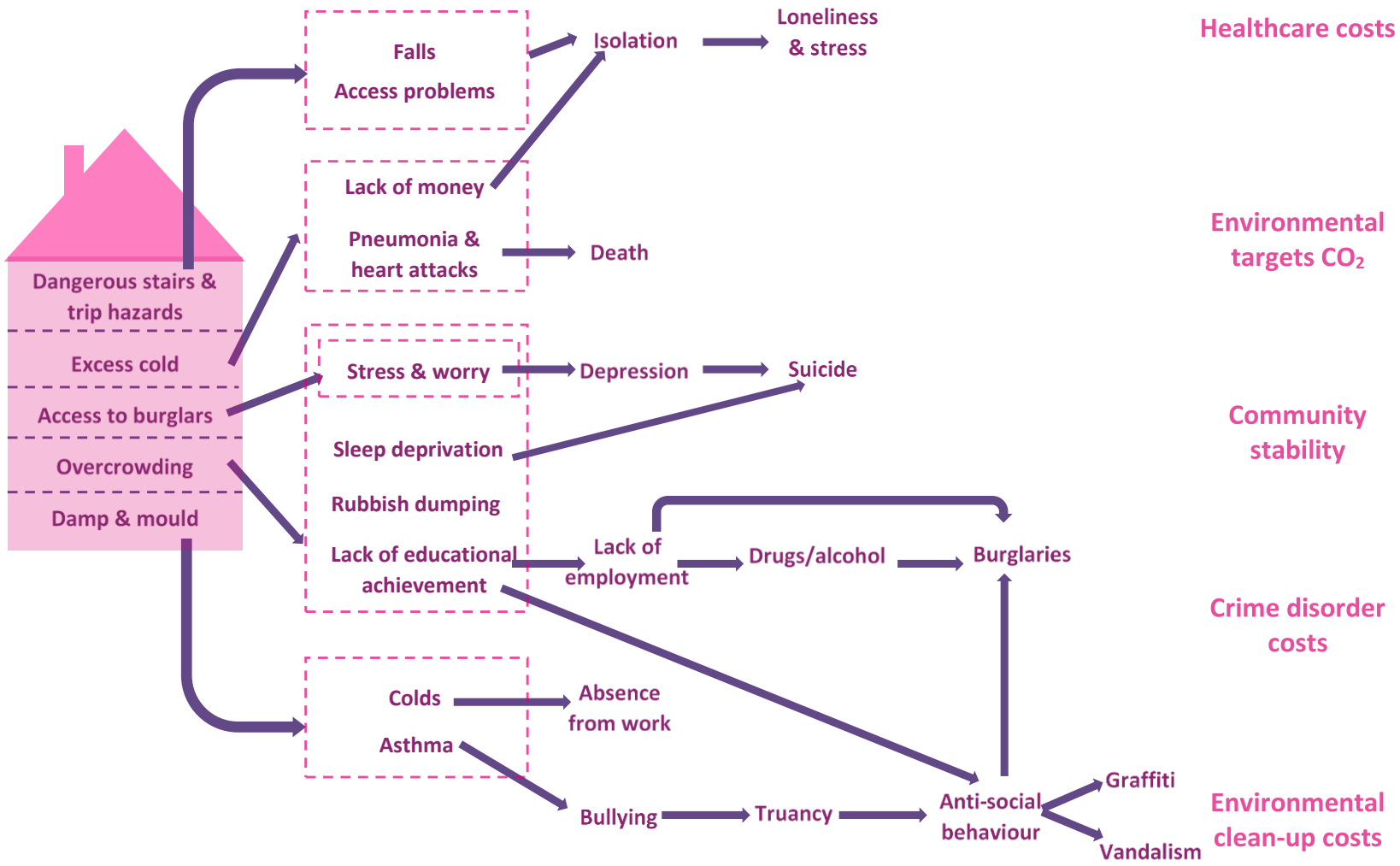
About BRE

All profits from the BRE Group are used by the BRE Trust to fund new research and education programmes that will help to meet its goal of ‘building a better world together’

In 2011/12 BRE Trust expenditure on research was £3.17 million, compared with £2.93 million the previous year. These funds support the three key elements of the Trust's activities: research, publications and five university centres of excellence

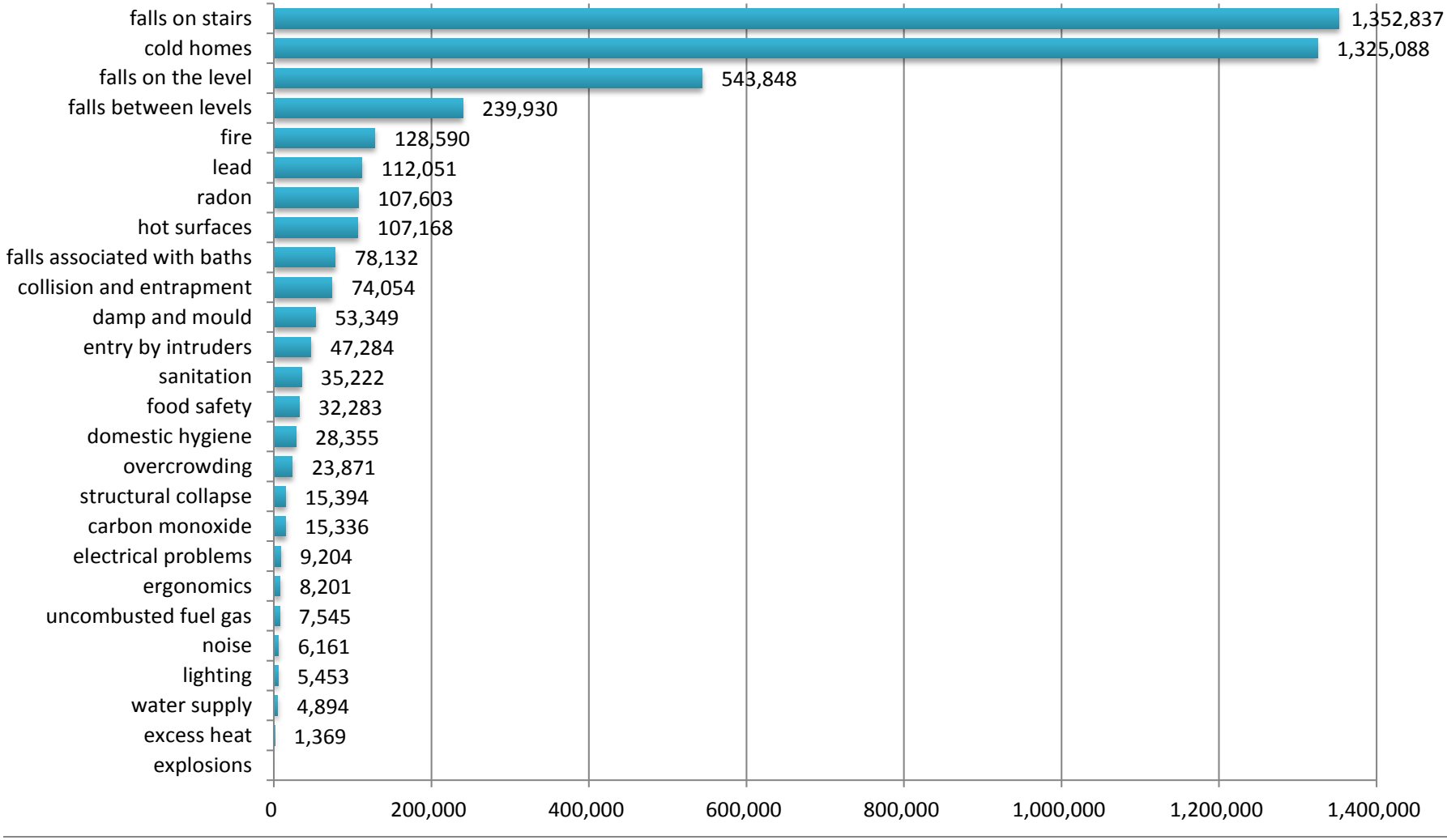
The Housing Health Cost Calculator

Linking Housing and Health



HHSRS Category 1 hazards (EHS 2011)

3.4 million (15%) of English homes have a Category 1 HHSRS hazard



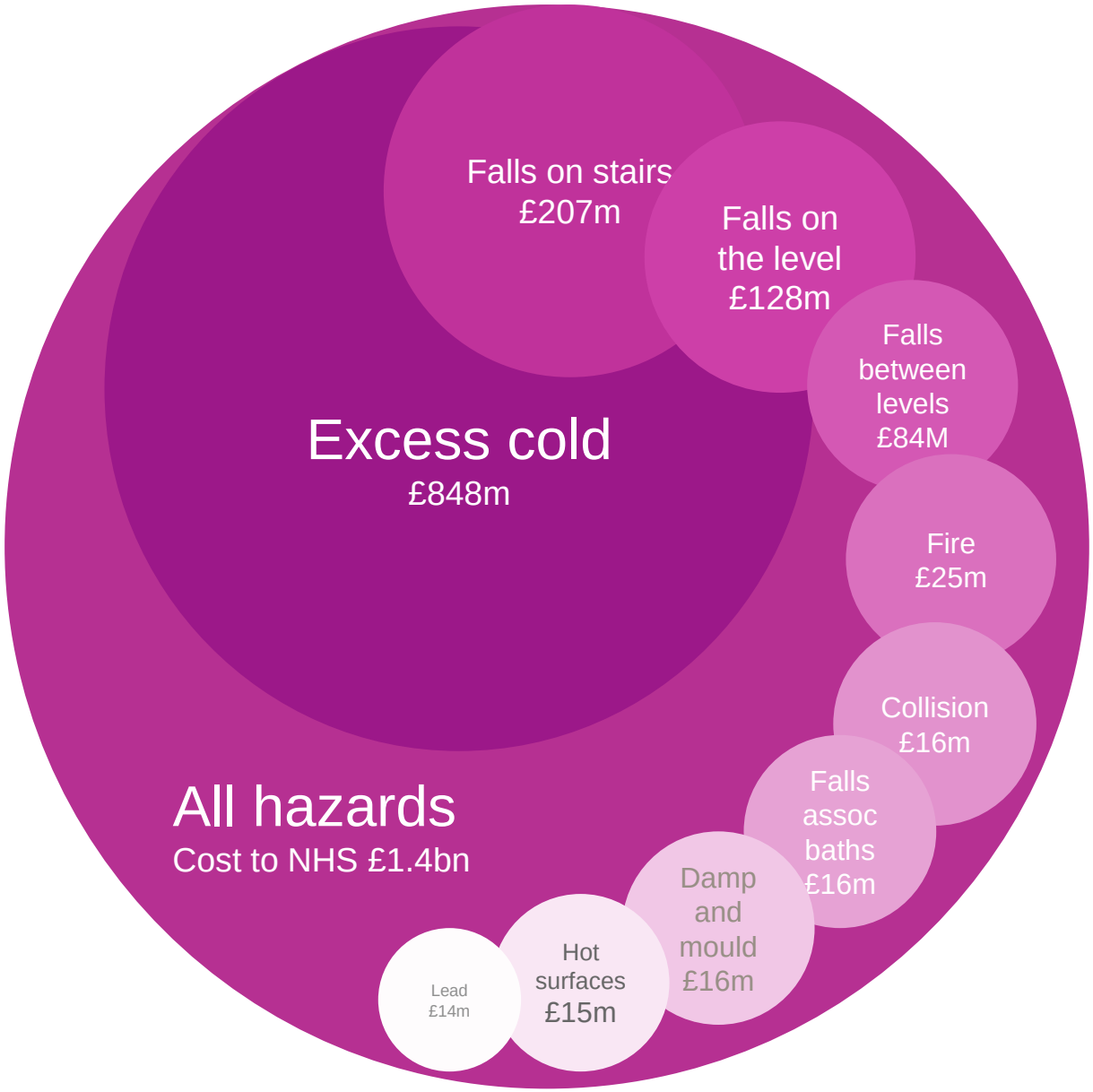
Typical HHSRS outcomes and 1st year treatment

	HHSRS Outcome			
Hazard	**Class 1**	**Class 2**	**Class 3**	**Class 4**
Damp and mould growth	Not applicable -	Type 1 allergy (£2,034)	Severe asthma (£1,027)	Mild asthma (£242)
Excess cold	Heart attack, care, death (£19,851)	Heart attack (£22,295)*	Respiratory condition (£519)	Mild pneumonia (£84)
Radon (radiation)	Lung cancer, then death (£13,247)	Lung cancer, survival (£13,247)*	Not applicable -	Not applicable -
Falls on the level	Quadriplegia (£92,490)*	Femur fracture (£39,906)*	Wrist fracture (£1,545)	Treated cut or bruise (£115)
Falls on stairs and steps	Quadriplegia (£92,490)*	Femur fracture (£39,906)*	Wrist fracture (£1,545)	Treated cut or bruise (£115)
Falls between levels	Quadriplegia (£92,490)*	Head injury (£6,464)*	Serious hand wound (£2,476)	Treated cut or bruise (£115)
Fire	Burn ,smoke, care, death (£14,662)*	Burn, smoke, Care (£7,435)*	Serious burn to hand (£1,879)	Burn to hand (£123)
Hot surfaces and materials	Not applicable -	Serious burns (£7,378)	Minor burn (£1,822)	Treated very minor burn (£123)
Collision and entrapment	Not applicable -	Punctured lung £5,152	Loss of finger £1,698	Treated cut or bruise £115

Not applicable = HHSRS class very rare or non existent
*** = Costs after 1 year are likely to occur, these are not modelled**

Main source: National Schedule of Reference Costs 2010-11 for NHS Trusts

Poor housing: NHS first year treatment costs 2011



Including all sub-standard housing

- 2010 report: Total cost of poor housing = **£600m**
- 2014 report: Total cost of poor housing (HHSRS Cat 1) = **£1.4bn**
- 2014: Add HHSRS Cat 2 housing = **+ £428m**
- 2014: Add all sub-standard housing = **+ £160m**

- ***The full cost (in terms of NHS first year treatment costs) of sub-standard housing = £2.0bn***

Comparative cost burden to the NHS

Risk Factor	Total cost burden to the NHS
Physical inactivity	£0.9 billion – £1.0 billion
Overweight and obesity	£5.1 billion – £5.2 billion
Smoking	£2.3 billion – £3.3 billion
Alcohol intake	£3.2 billion – £3.2 billion
Poor housing	£1.4 billion – £3.5 billion?

Payback example: Falls on stairs

- HHSRS Band C (Cat 1 hazard)
- Work = replace balustrades
- Cost of work = £314
- Annual benefit to NHS = £146
- Payback = 2.1 years

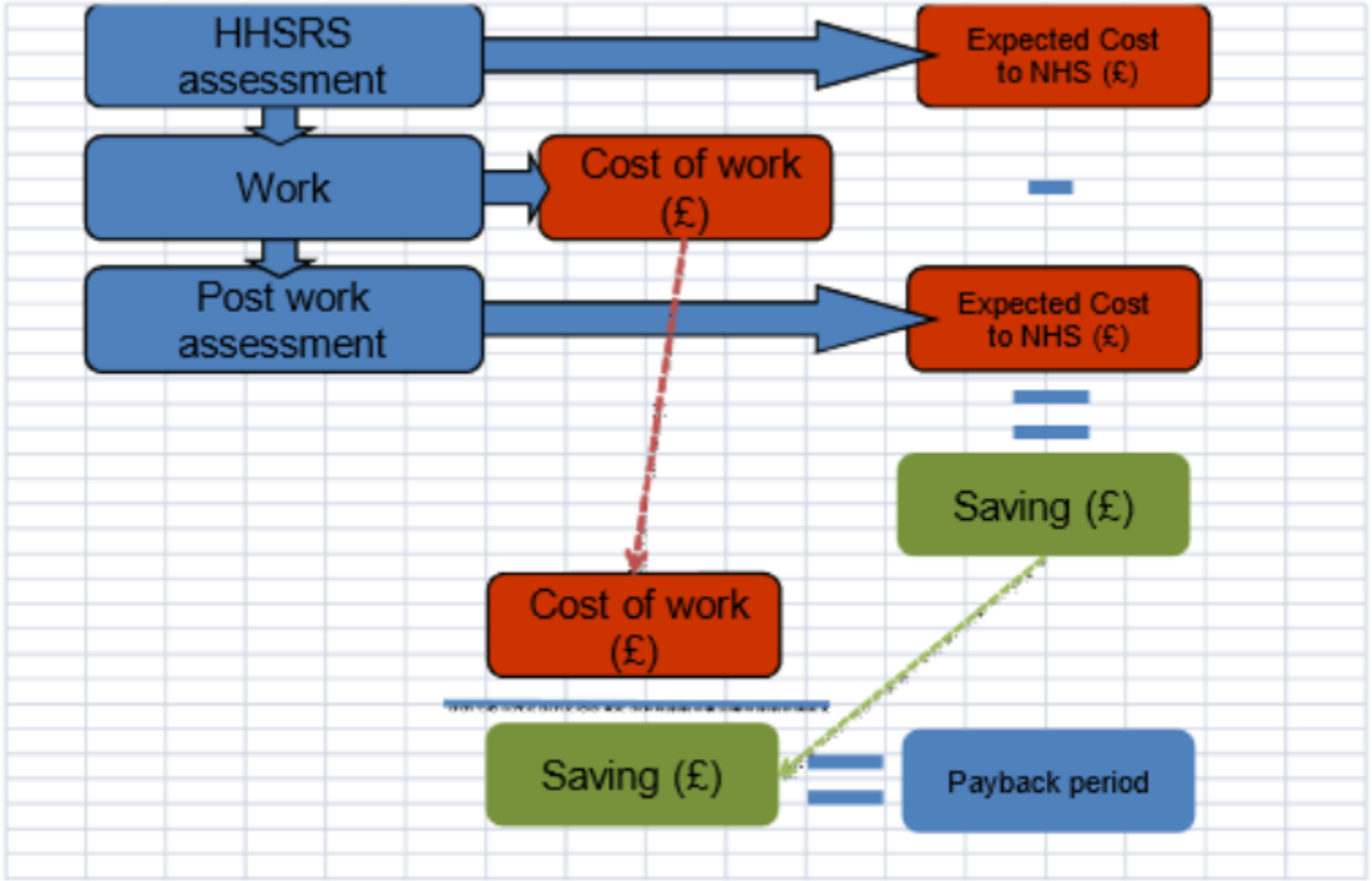
The Housing Health Cost Calculator

- Helps quantify the extent to which improvements to housing takes pressure off health services
- Can assist in the targeting of resources towards actions with the greatest returns
- Can assist in bids for funding

What does the calculator do?

- Details of an HHSRS assessment can be added
- Website will calculate cost to NHS and to society
- Can add a post work assessment to measure savings
- Costs of doing work can also be added, enabling the calculator to work out a payback period

Methodology



BRE HHCC

Home | Data | Forum | About | Support | Sign In

Housing Health Cost Calculator

Quick Sign In

Email Address

Password

Sign In | Forgot Password?

Home >

Benefit from BRE expertise and find out the real cost of poor housing to the NHS and society with individual data analysis per dwelling by using the Housing Health Cost Calculator.

More information
Register Free
Price Plans

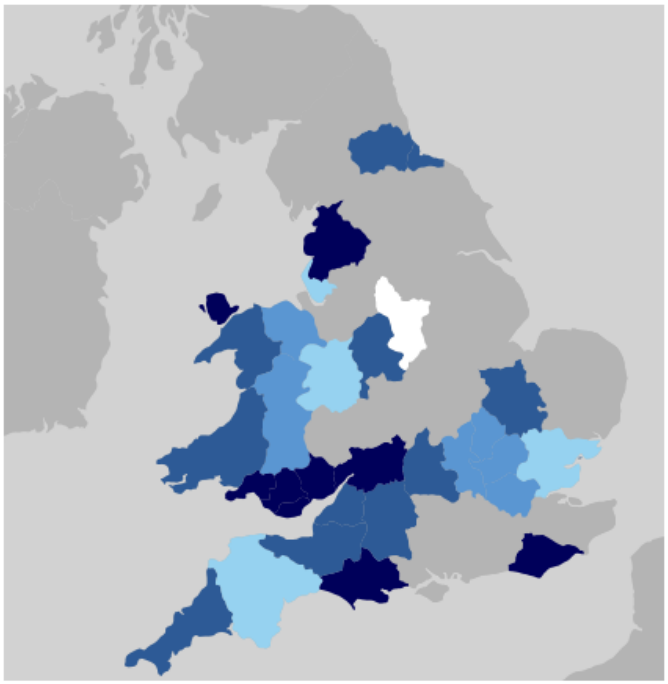
Partners

Local Authorities using HHCC

294

Resultant savings to society

£11,708,216



£2,000,000+
£1,000,000+
£500,000+
£100,000+
£0+
No data

Savings to Society

The savings are based on reducing harm outcomes following mitigation of HHSRS hazards. The savings to society are calculated as two and a half times the NHS savings as stated in The Real Costs of Poor Housing.

More information

HHCC updates

Chris Johnes
16 Mar 2016

From tomorrow morning the site will be adjusted so that surveys will be arranged by the survey date, rather than when they were added to the site. Users will find that surveys will be rearranged within 'My Database' into the appropriate year and the 'Local Yearly Aggregated Data' section will now contain the correct information.

A new bulk upload template will also be added to the site. The new template has been altered to take into account recent changes to the site. If you have a previous version of the template saved on your computer please delete this and use the new one.

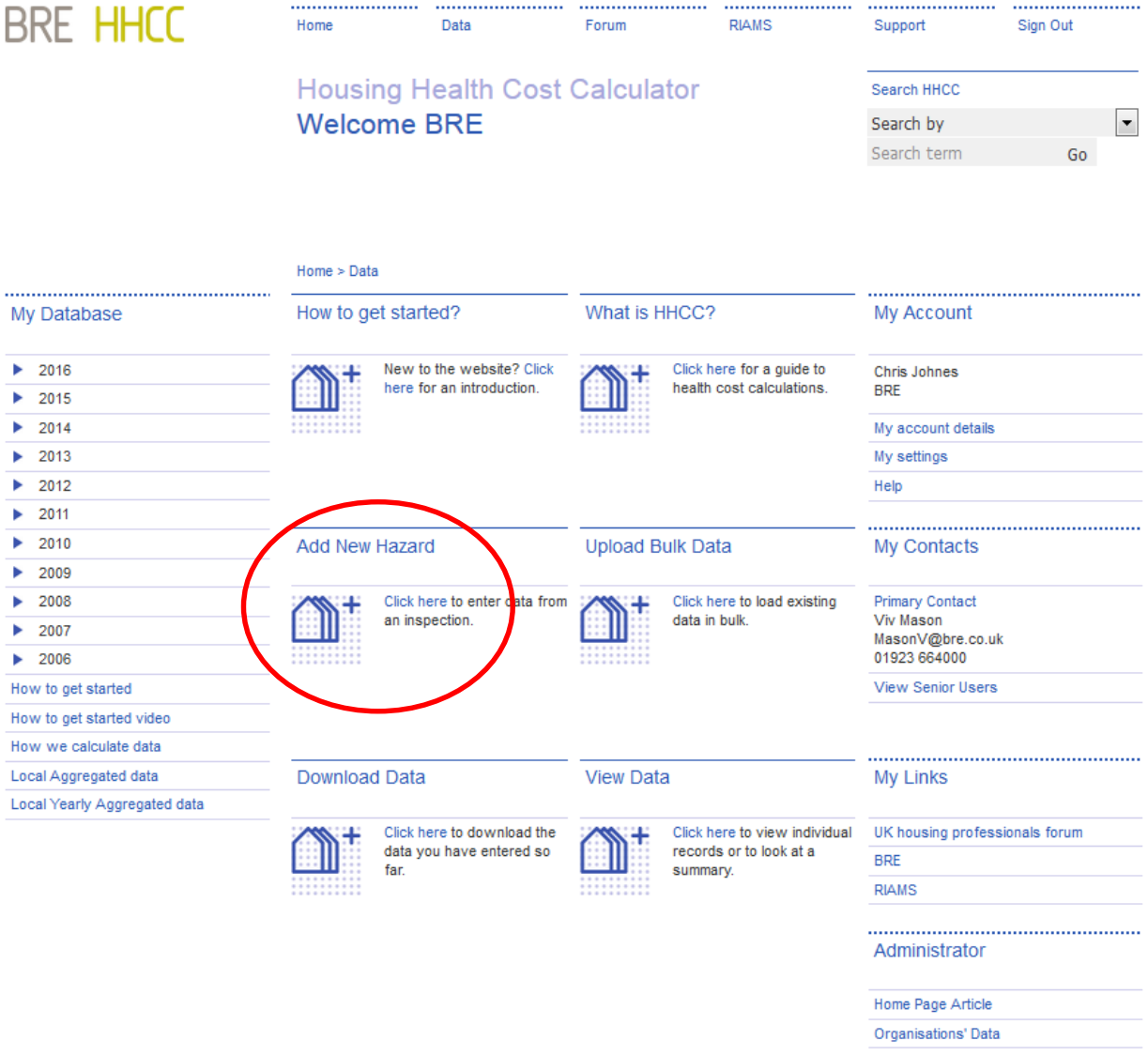
As always, if you have any feedback or ideas for improvement please let us know at hhcc@bre.co.uk.

More information

www.housinghealthcosts.org

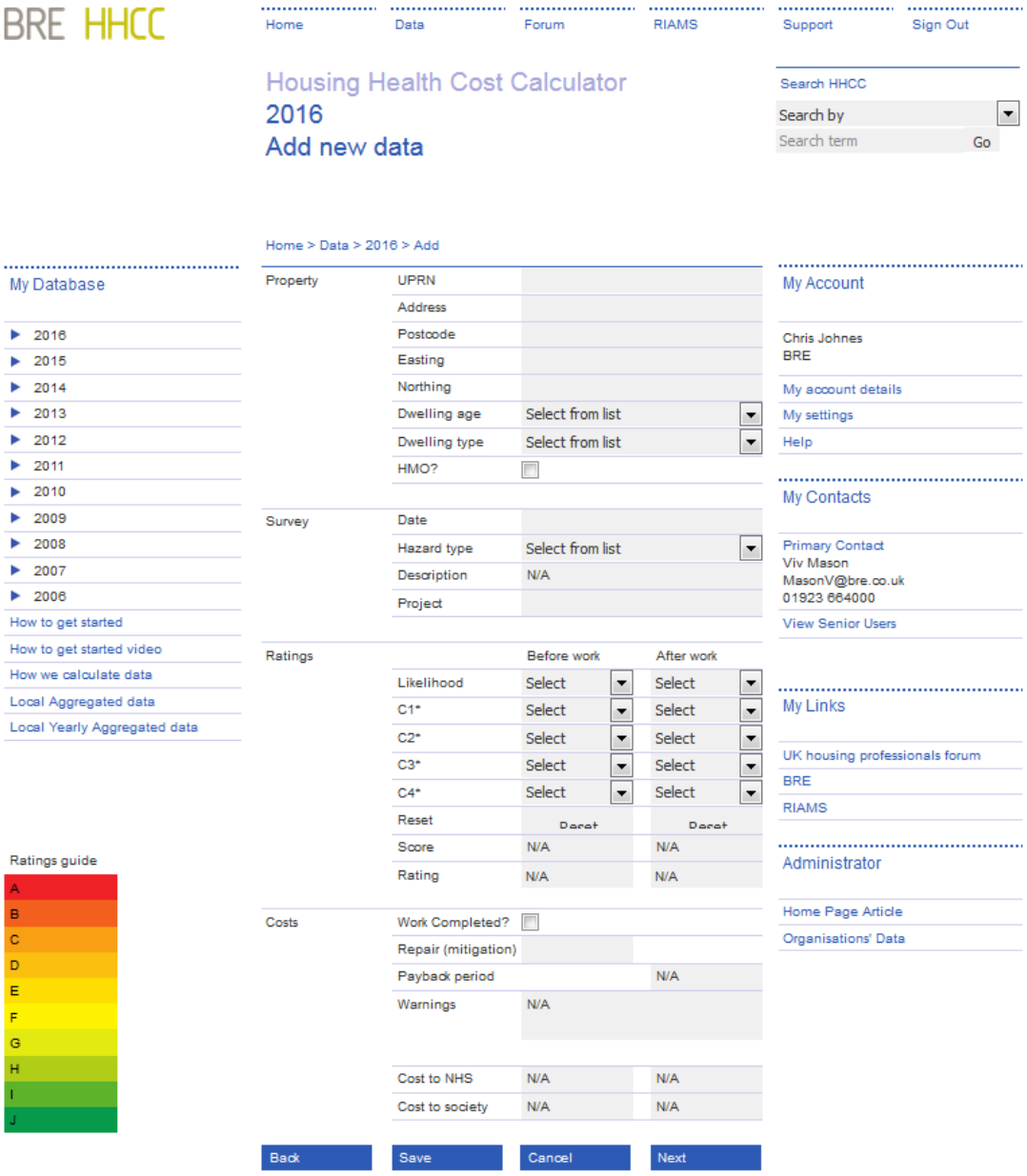
How to add a case

– Click here to start adding cases one by one



How to add a case

- Cases can be added one by one
- You can identify dwellings by address, UPRN or both
- HHSRS system uses representative scale points
- Average values put in by default
- NHS costs and costs to society appear at the bottom of the screen



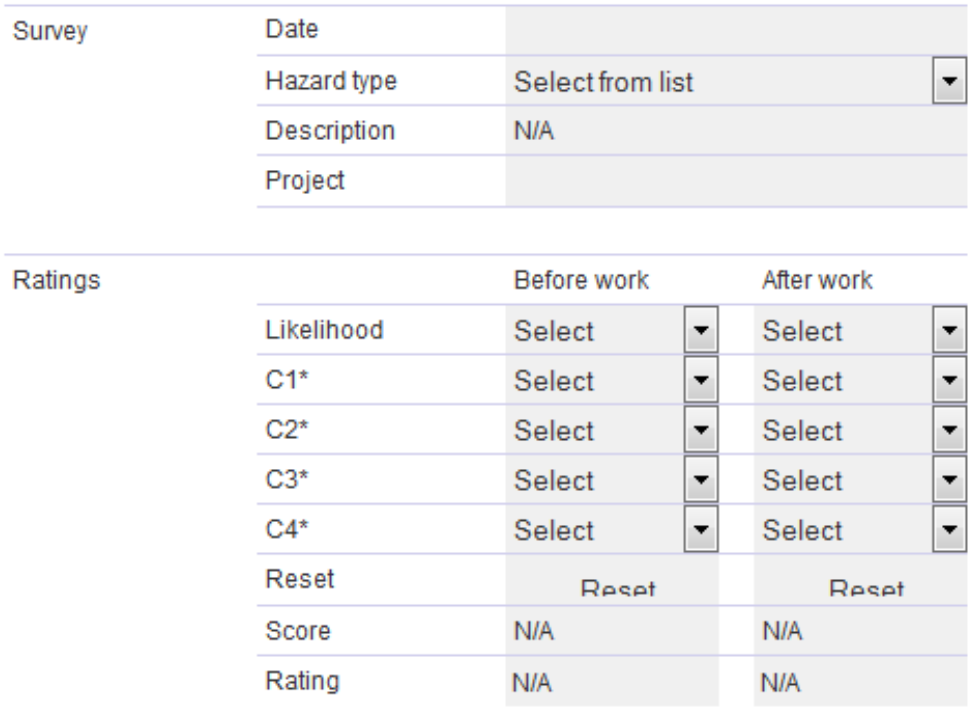
How to add a case

– Background information about the property

Property	UPRN	
	Address	
	Postcode	
	Easting	
	Northing	
	Dwelling age	Select from list
	Dwelling type	Select from list
	HMO?	☐

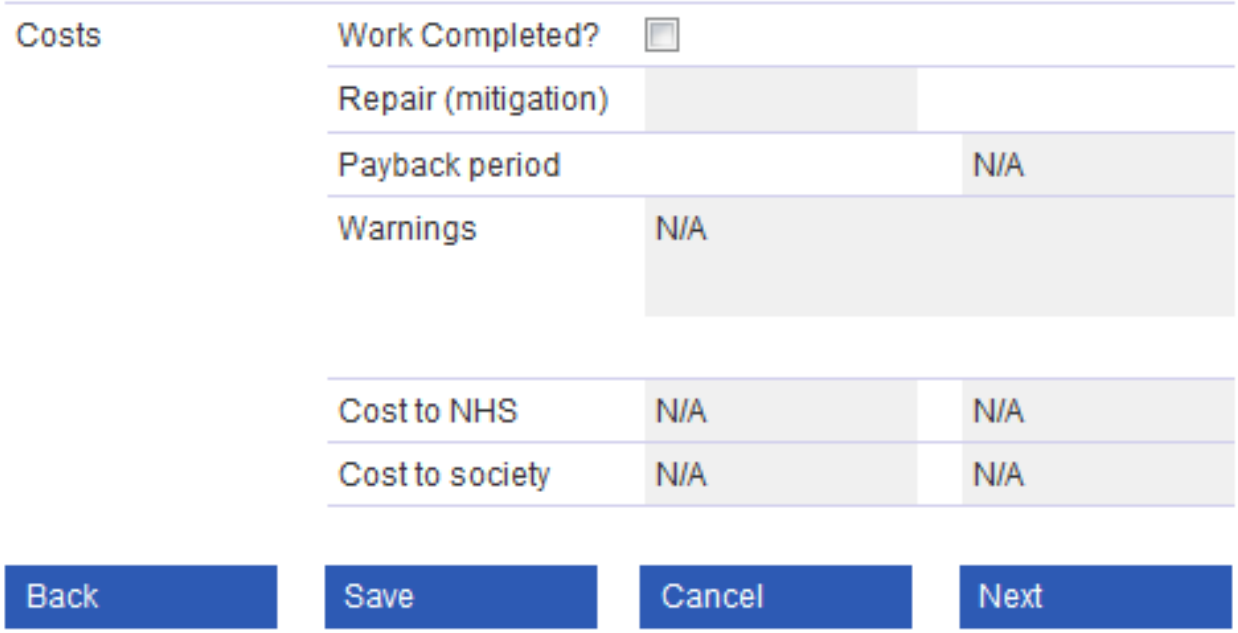
How to add a case

- Select survey date
- Select hazard type
- Add project name (if relevant)
- HHSRS averages will be added
- Likelihood can be altered via dropdown box
- To alter spread of harms click ‘reset’ and then select relevant scale points
- Score and rating will be calculated



How to add a case

- If the work is complete repair costs can be added
- Payback period will be calculated
- Cost to NHS and Society will be displayed

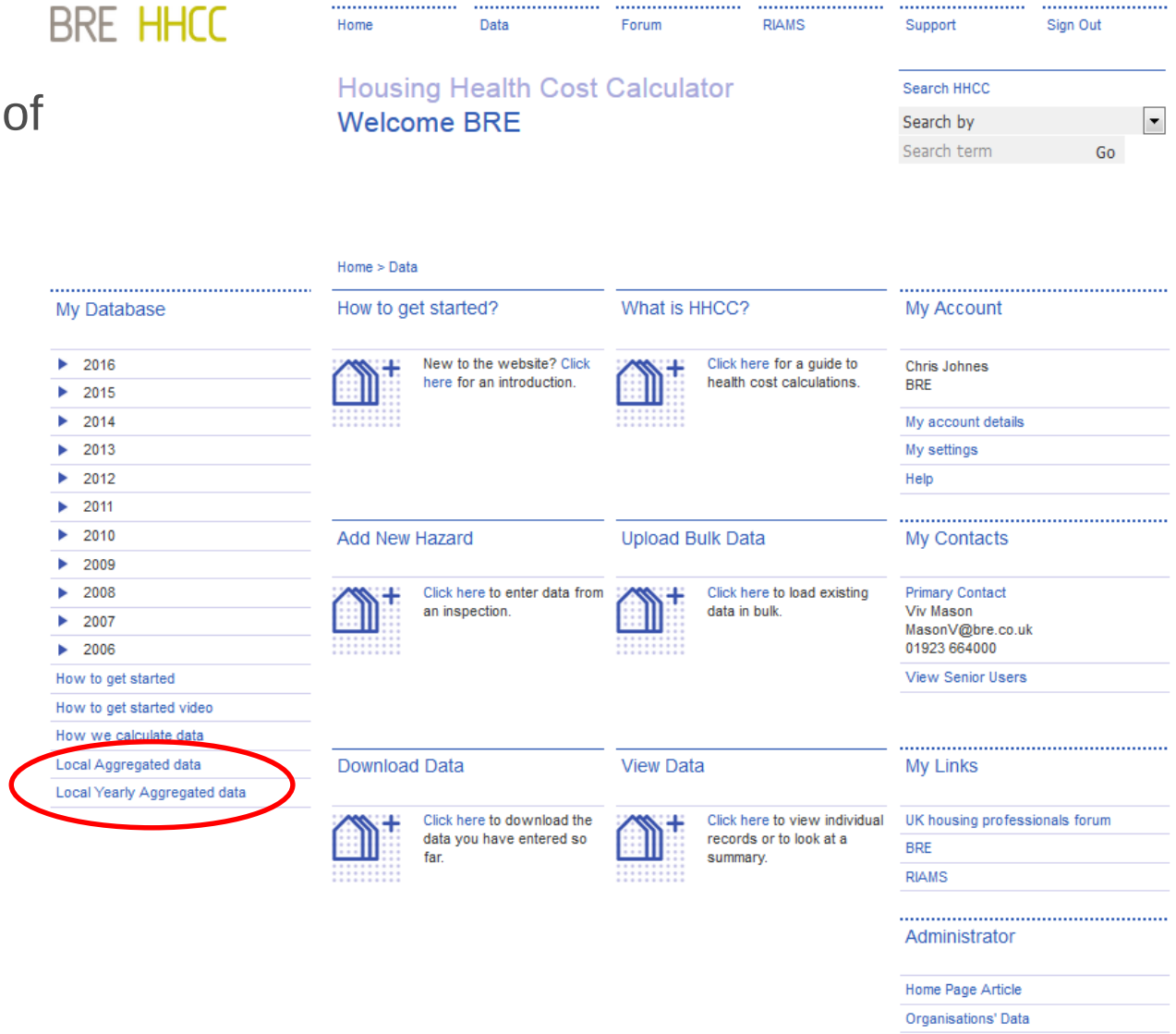


Example

Survey	Date	9 July 2015	
	Hazard type	02	
	Description	Excess cold	
	Project	N/A	
Ratings		Before work	After work
	Likelihood	32	560
	C1*	31.6	31.6
	C2*	4.6	4.6
	C3*	21.5	21.5
	C4*	42.3	42.3
	Score	10234	585
	Rating	A	D
Costs	Work Completed?	No	
	Repair (mitigation)	£3,000	-
	Payback period	-	40 Months
	Warnings	N/A	
	Cost to NHS	£946	£54
	Cost to society	£2,365	£135

Reviewing your data

– Shows a summary of data entered so far



Reviewing your data

- Can order data by rank, hazard, or savings
- Savings can be broken down by calendar year

Home > Data

Yearly savings for BRE

Year	Savings to NHS	Savings to society
2015	£375,358	£938,395
2014	£99,102	£247,755
2013	£3,267	£8,168
2012	£61,890	£154,725
2011	£17,032	£42,580
2010	£30,204	£75,510
Total for BRE	Savings to NHS	Savings to society
	£586,853	£1,467,133

Home > Data

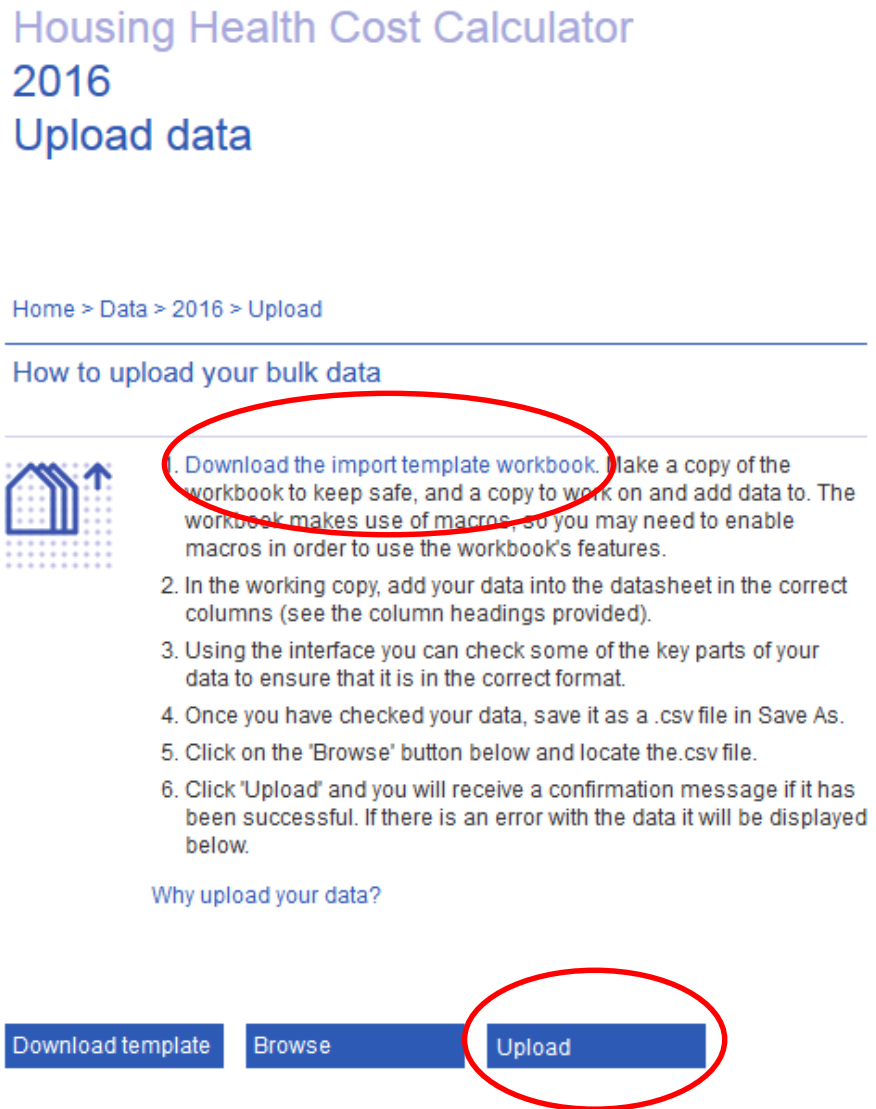
Show project: Show all Sort data by: Rank

Hazards for BRE

Rank	Hazard	Savings to NHS	Savings to society
01	Excess cold	£131,348	£328,370
02	Falling on stairs etc	£8,858	£22,145
03	Structural collapse and fallin...	£2,129	£5,323
04	Electrical hazards	£1,983	£4,958
05	Damp and mould growth	£268,746	£671,865
06	Collision and entrapment	£560	£1,400
07	Excess heat	£68,019	£170,048
08	Falling on level surfaces etc	£4,050	£10,125
09	Carbon monoxide	£90,580	£226,450
10	Fire	£1,566	£3,915
11	Lead	£891	£2,228
12	Personal hygiene, Sanitation a...	£840	£2,100
13	Falling between levels	£481	£1,203
14	Entry by intruders	£204	£510
15	Crowding and space	£405	£1,013
16	Biocides	£5,125	£12,813
17	Position and operation of amen...	£0	£0
18	Flames, hot surfaces etc	£5	£13
19	Food safety	£140	£350
20	Radiation	£0	£0
21	Uncombusted fuel gas	£497	£1,243
22	Noise	£146	£365
23	Domestic hygiene, Pests and Re...	£134	£335
24	Water supply	£146	£365
Total for BRE		Savings to NHS	Savings to society
		£586,853	£1,467,137

Loading data in bulk

- If you have existing data you can upload it in bulk
- You will need to format your data correctly to do this
- A template Excel file is available on the site



The Excess Cold Calculator

2

XCC

- The Excess Cold Calculator was created by BRE with support and advice from the CIEH
- The heating cost and adequacy calculations used by the tool are underpinned by BRE's long experience of measuring and modelling the energy consumption of buildings to support government programmes and for industry
- It has been designed to provide reliable estimates of running costs and heating adequacy based on a relatively small number of inputs
- The result is a tool that is considerably quicker and easier to use than most energy modelling software and focussed specifically on the assessment of cold in properties.

https://www.excesscold.com/

XCC

- Designed to assist the assessment of the hazard of excess cold in UK dwellings
- The user provides details about the dwelling and its occupants and XCC provides an estimate of the likely running costs and an assessment of the adequacy of the heating system
- Additional tool to provide heat loss calculations for individual rooms
- Data collection sheet for use during inspections available for download
- New updates being trialled to make the tool much more straightforward to use

bre

Excess cold tool
Developed by BRE.

XCC

Welcome to BRE XCC
BRE Excess Cold Calculator

Now available to download: Real life case studies of the XCC in action and printable data sheets to aid collection of property details. Follow this link to read more.

This website provides support for the use of a tool designed to assist Environmental Health Practitioners and Technical Officers in the assessment of the hazard of Excess Cold in UK dwellings. When provided with details about the dwelling and its occupants the Calculator provides an estimate of the likely running costs and an assessment of the adequacy of the heating system provided. The tool can then be re-run with modifications to test scenarios for possible improvement measures, such as packages of insulation and heating system improvements, in order to consider suitable remedial action and to assist in the calculation of its cost-effectiveness. This information will be useful as supporting evidence for Officers' decisions on the presence of Excess Cold hazards and in justifying any requirement for mitigation measures.

The Excess Cold Calculator was created by BRE with support and advice from the Chartered Institute of Environmental Health, who advised that its members would find it helpful if we could supply a tool to provide supporting evidence for their decisions. The heating cost and adequacy calculations used by the tool are underpinned by BRE's long experience of measuring and modelling the energy consumption of buildings to support government programmes and for industry. The Excess Cold Calculator was designed to provide reliable estimates of running costs and heating adequacy based on a relatively small number of inputs in order to limit the time and effort required to collect dwelling data. The result is a tool that is considerably quicker and easier to use than most energy modelling software and focussed specifically on the assessment of an Excess Cold hazard.

To start using the tool, please log in to read the user guide from the download section and then add dwellings to assess.

Sign up now to BRE's XCC!

If you have already registered, please log in to access your account.

Otherwise, in order to use the Excess Cold Calculator users must be registered. To begin the registration process please click here.

If you have any difficulty with the registration process please click here for help. If you have any more general questions about the Excess Cold Calculator please visit the Frequently Asked Questions page in the first instance, or click on the 'Contact us' link at the top of this page if your question is not already answered.

bre

Excess cold tool
Developed by BRE.

Welcome to BRE XCC
BRE Excess Cold Calculator

Increased comfort or reduced energy costs? Use XCC to assess the temperature that a household could achive for a given level of fuel cost. Follow this link to read more.

This website provides support for the use of a tool designed to assist Environmental Health Practitioners and Technical Officers in the assessment of the hazard of Excess Cold in UK dwellings. When provided with details about the dwelling and its occupants the Calculator provides an estimate of the likely running costs and an assessment of the adequacy of the heating system provided. The tool can then be re-run with modifications to test scenarios for possible improvement measures, such as packages of insulation and heating system improvements, in order to consider suitable remedial action and to assist in the calculation of its cost-effectiveness. This information will be useful as supporting evidence for Officers' decisions on the presence of Excess Cold hazards and in justifying any requirement for mitigation measures.

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Home
Assessor details
My Cases
New Case
Downloads
FAQs

New XCC case

BRE Excess Cold Calculator

New case:

Insert a distinct name for the new case and click create.

Case name

Create

Duplicate an existing case

Select one of the existing cases from the list and click on the button to duplicate the selected cases.

Case name to duplicate: Select a case to duplicate

duplicate

Import a case

Enter the RRN of an existing case (as displayed on the report with dashes between sections) and click import to recreate the case.

Case RRN

Import

You can also start with a template and customise for your needs. Choose from the following example case configurations:

test 1 Typical semi UK average Not HMO Main: Post 98 mains gas non-condensing boiler Secondary: None / not used Water: From main heating system	test 2 Bedsit South West England HMO Main: Electric fires Secondary: None / not used Water: Electric instantaneous point of use	test 3 Oil bungalow North East England Not HMO Main: Pre 98 oil non-condensing boiler Secondary: Electric fires Water: From main heating system
test 4 Flat South East England Not HMO Main: Mains gas condensing boiler Secondary: None / not used Water: From main heating system	test 5 Big old detached Midlands Not HMO Main: Pre 98 oil non-condensing boiler Secondary: Closed fires (coal) Water: From main heating system	test 6 Converted garden shed Midlands Not HMO Main: Electric fires Secondary: None / not used Water: Electric instantaneous point of use
test 7 Modern Mid-terrace Borders HMO Main: Mains gas condensing boiler Secondary: Closed fires (wood) Water: From main heating system	test 8 Electric semi UK average Not HMO Main: Old electric storage heaters Secondary: Electric fires Water: Electric immersion	test 9 Ecohome UK average Not HMO Main: Wood solid fuel boiler Secondary: None / not used Water: From main heating system

General Parameters — incomplete! [+/-]

Case information [+/-]

Allow sharing of this case?	Yes Sharing allows this project to be recreated by other users. Please see FAQ 8 for further details
Case name	New Test Case 1
Address Line 1	Insert a valid address line
Address Line 2	
Address Line 3	
Post Town	Insert a valid Post Town
Post Code	Insert a valid Post Code
Weather Region	UK average
Related Party Disclosure	Select valid option from list Insert a valid option from those available in the list
Inspection date	yyyy-mm-dd Insert the inspection date in the following format: yyyy-mm-dd
Property Type	House - semi-detached
Property Age	1950-1966

[hide]

XCC Assessment Data **incomplete!** [+/-]

Choose one of these options or fill in Room Data:

Expand all | Collapse all

About the dwelling [+/-]

Dwelling type	Not HMO
Total floor area (m^2)	m^2 Insert a valid Area
Dwelling volume (m^3)	m^3 Insert a valid Volume
Number of habitable rooms	Insert a valid integer value greater than 0
Number of habitable rooms heated	Insert a valid integer value greater than 0
Number of Occupants	Insert a valid integer value greater than 0

Heating patterns and temperatures [+/-]

Heating patterns

Weekday On Time		Off Time		Weekend On Time		Off Time	
07	00	09	00	07	00	23	00
16	00	23	00				

Temperature living room heated to 21 °C

Heat Loss Information [+/-]

Conduction Heat losses

	Area (m^2)	U-value (W/m^2K)
Wall type 1		
Wall type 2		
Floor type 1		
Floor type 2		
Roof type 1		
Roof type 2		
Party wall		
Window type 1		
Window type 2		
Roof windows		
Doors		
Doors to unheated internal spaces		
Other external 1		
Other external 2		
Heat loss to internal (unheated)		

Wall type 1 area and U-value must be filled in

Air change rate (ach) ach Insert a valid numeric value between 0.5 and 5.
If Unknown enter 0.75.

U-value help

Fill in to estimate Wall U-values:
Dwelling age | Wall type | Uvalue
Select Op | Select Option | ?

Fill in to estimate Roof U-values:
Roof type | Ins. thickness (mm) | Uvalue
Select Op | Select Option | ?

Fill in to estimate Flat Roof U-values:
Age of roof | Uvalue
Select Option | ?

Fill in to estimate Floor U-values:
Description | Uvalue
Select Option | ?

Fill in to estimate Party Walls U-values:
Description | Uvalue
Select Option | ?

Fill in to estimate Window U-values:
Window type | Uvalue
Select Option | ?

Fill in to estimate Door U-values:
Description | Uvalue
Select Option | ?

Heating Systems Information [+/-]

Main heating fuel: Electricity

Main heating type: New electric storage heaters

SEDBUK 2009 Efficiency: %

Click here to access the UK Boiler Efficiency Database

Secondary heating type: None / not used

Water heating type: Select valid option from list

Insert a valid option from those available in the list

Hot water insulation: Not applicable

Fuel Prices [+/-]

Fuel price information

	Standing Charge (GBP/yr)	Unit Price (p/kWh)
Mains gas		
LPG		
Oil		
Coal		
Wood		
Electricity (standard rate)		
Electricity (off peak)		
Electricity (on peak)		

Check FAQ with default fuel prices here

Tiered tariff help

Fill in to convert to Standing charge:

Units in first tier units

1st tier unit price p/kWh

2nd tier unit price p/kWh

Standing Charge ? GBP

Fuel units converter

Fill in to convert to p/kWh:

Fuel and units of sale

Select Option

Units purchased

Total price paid (£)

Price in p/kWh ? p/kWh

Room Data assessment — filled [+/-]

Enter data in the following sections for each room where you wish to assess the adequacy of the heating system provided. It is not necessary to supply data for every room unless you also wish to assess whether the total heat requirement of the dwelling can be met by a central system (e.g. is a 15kW boiler large enough?). If not, you only need to enter data for those rooms you wish to assess. Data entered in this section of the calculation does not affect the fuel cost calculation above and can be left completely blank if not required.

Choose one of these options or fill in Room Data:

Expand all | Collapse all | Add another room

Room data [+/-]

Living Room [+/-]

Tick to include this room in the analysis: ☑

Room name	Living Room
Volume (m^3)	

Air infiltration heat loss

Air change rate (air changes per hour)	
Infiltration heat loss (W/K)	?

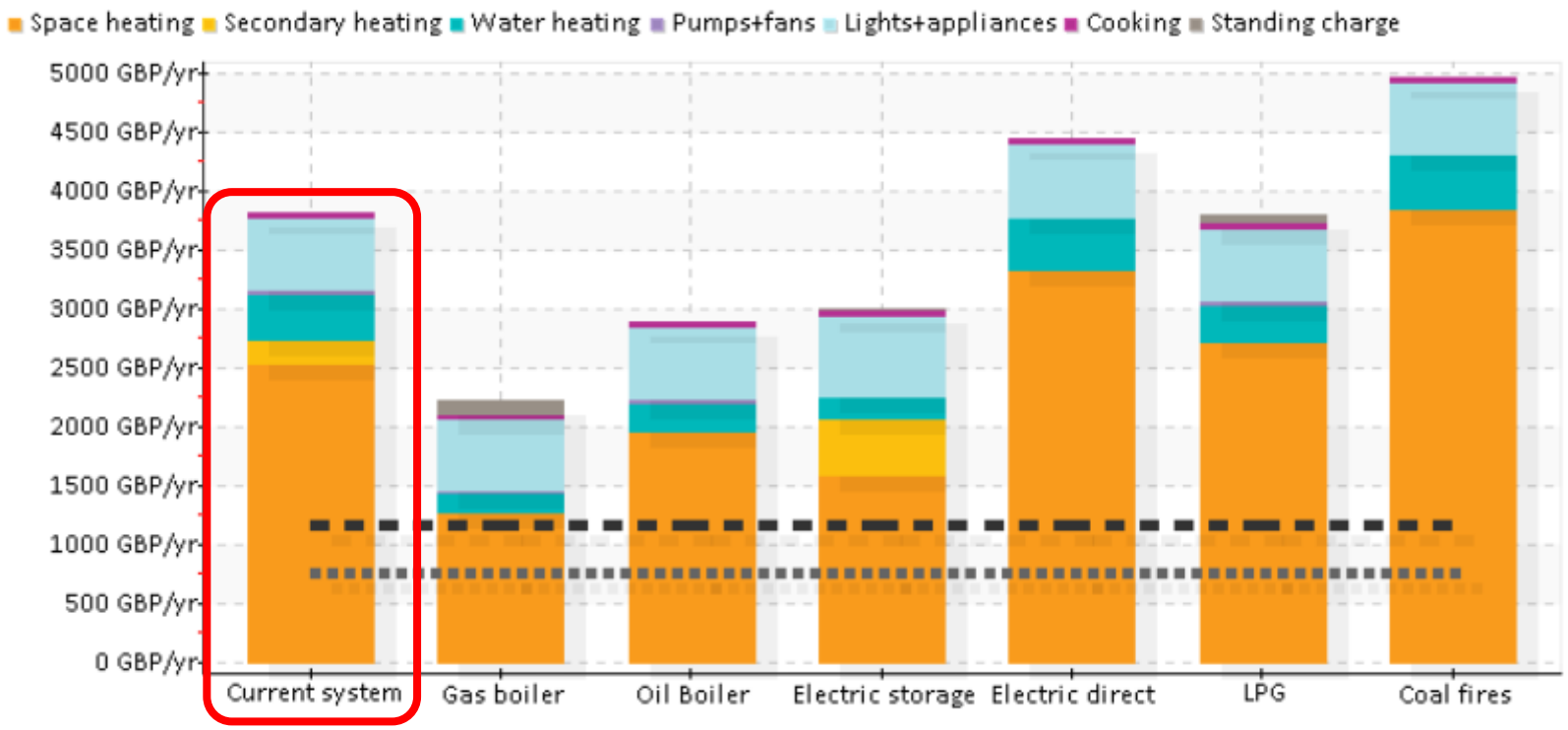
Heat loss elements bordering the external environment

Element	Area (m^2)	U-value (W/m^2K)	Heat loss (W/m^2)
Wall			
Roof			
Floor			
Other1			
Other2			
Window			
Door			
TOTAL			0

BRE XCC Report [+/-]

Case name: test_5 Big old detached
Dwelling Type: Not HMO
Dwelling area: 280 m^2
Current system: Pre 98 oil non-condensing boiler
Address 1: 63 Pheasant Way
Address 2:
Post Town: CIRENCESTER
Post Code: GL7 1BJ

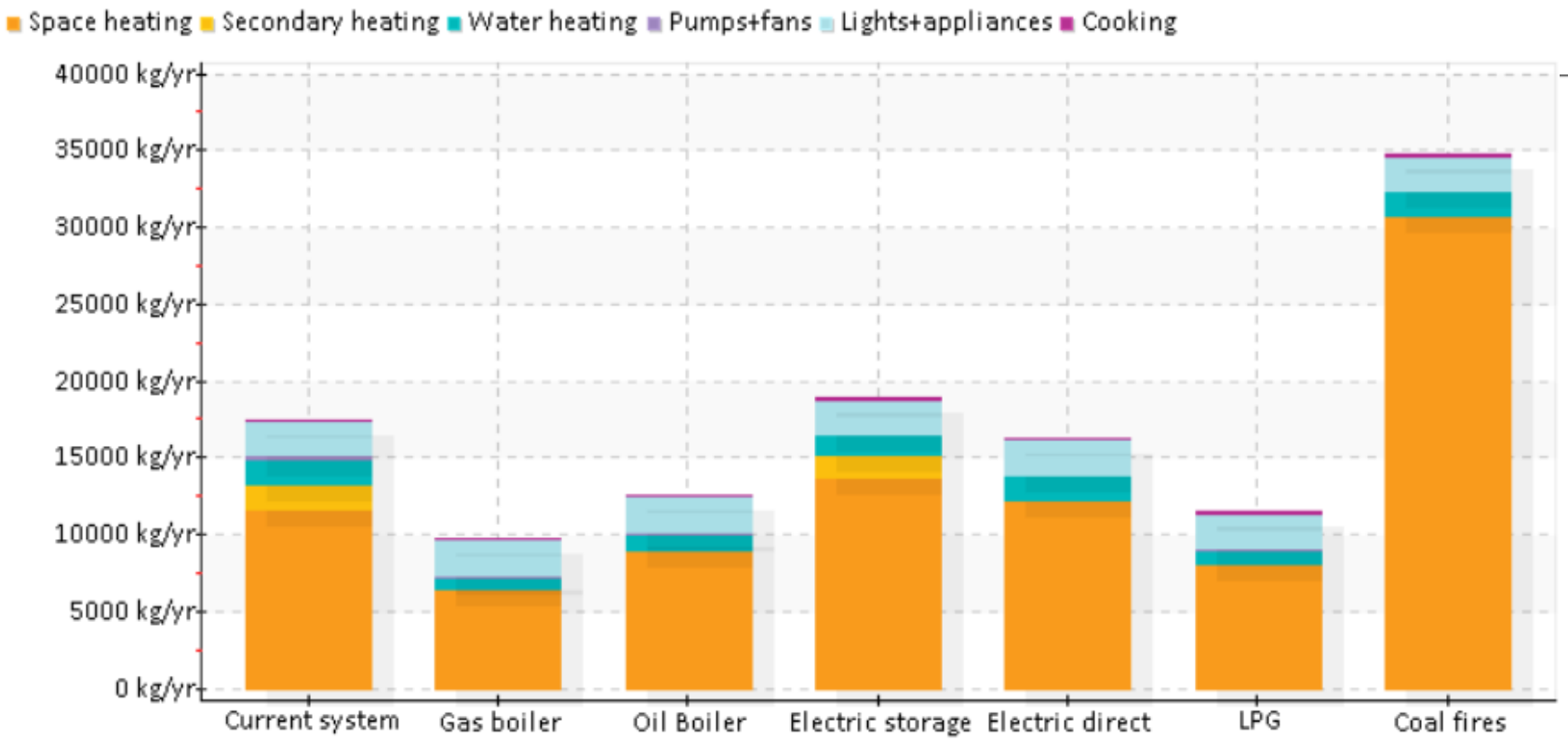
Annual Energy Costs with Pre 98 oil non-condensing boiler and alternative systems:



The dashed lines on the above graph indicate 10% of pensioner income for a single person and a couple respectively.

		Estimated annual running costs for this dwelling with alternative heating systems					
Fuel costs (GBP/yr)	Current system	Gas boiler	Oil Boiler	Electric storage	Electric direct	LPG	Coal fires
Space heating	2530	1260	1954	1584	3319	2713	3852
Secondary heating	197	0	0	483	0	0	0
Water heating	386	168	242	184	455	320	455
Pumps+fans	42	25	32	0	0	25	0
Lights+appliances	618	618	618	680	618	618	618
Cooking	54	40	54	59	54	55	54
Standing charge	0	116	0	20	0	70	0
TOTAL	**3827**	**2226**	**2901**	**3010**	**4446**	**3801**	**4979**
Approx. SAP rating	27	56	45	36	8	27	4
Approx. SAP band	F	D	E	F	G	F	G

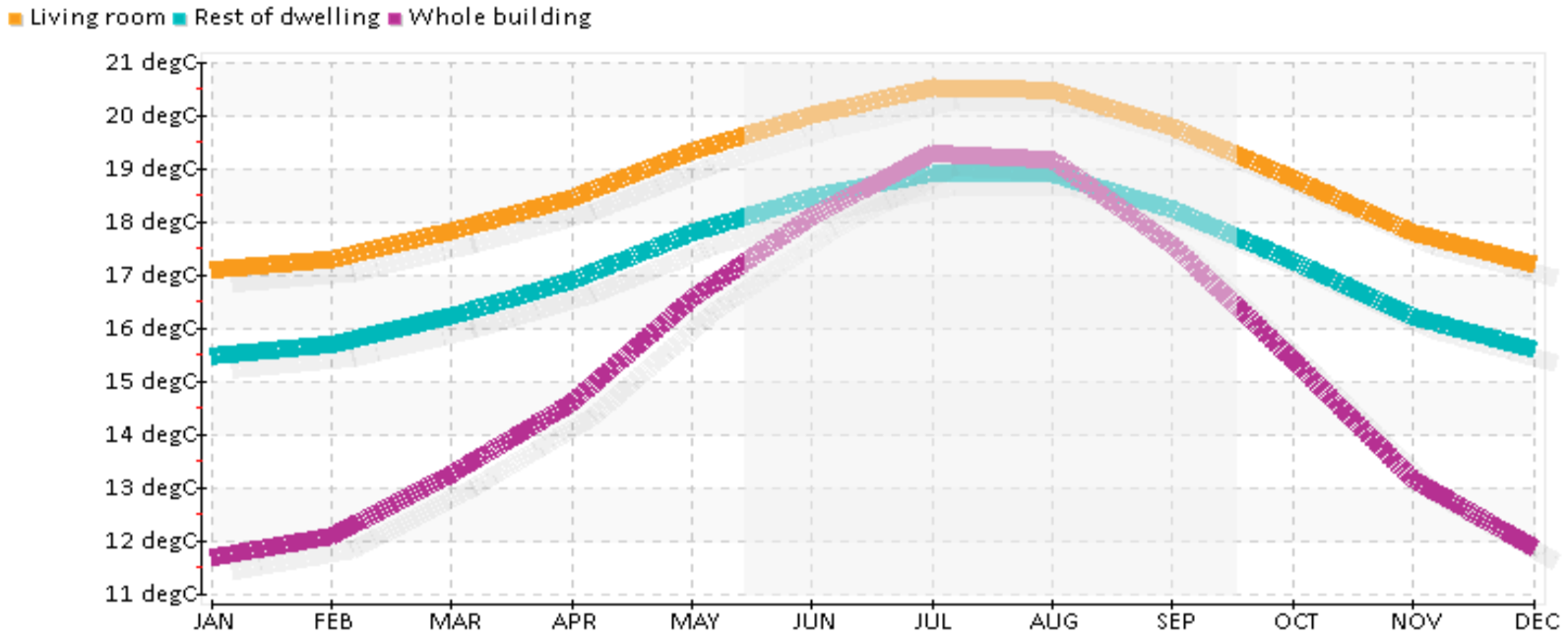
CO_2 Emissions with Pre 98 oil non-condensing boiler and alternative systems:



Estimated annual emissions for this dwelling with alternative heating systems

CO_2 emissions (kg/yr)	Current system	Gas boiler	Oil Boiler	Electric storage	Electric direct	LPG	Coal fires
Space heating	11651	6495	9000	13648	12239	8037	30672
Secondary heating	1567	0	0	1516	0	0	0
Water heating	1743	812	1083	1322	1677	974	1677
Pumps+fans	155	90	119	0	0	90	0
Lights+appliances	2280	2280	2280	2280	2280	2280	2280
Cooking	199	167	199	199	199	182	199
TOTAL	**17594**	**9844**	**12682**	**18967**	**16395**	**11563**	**34828**

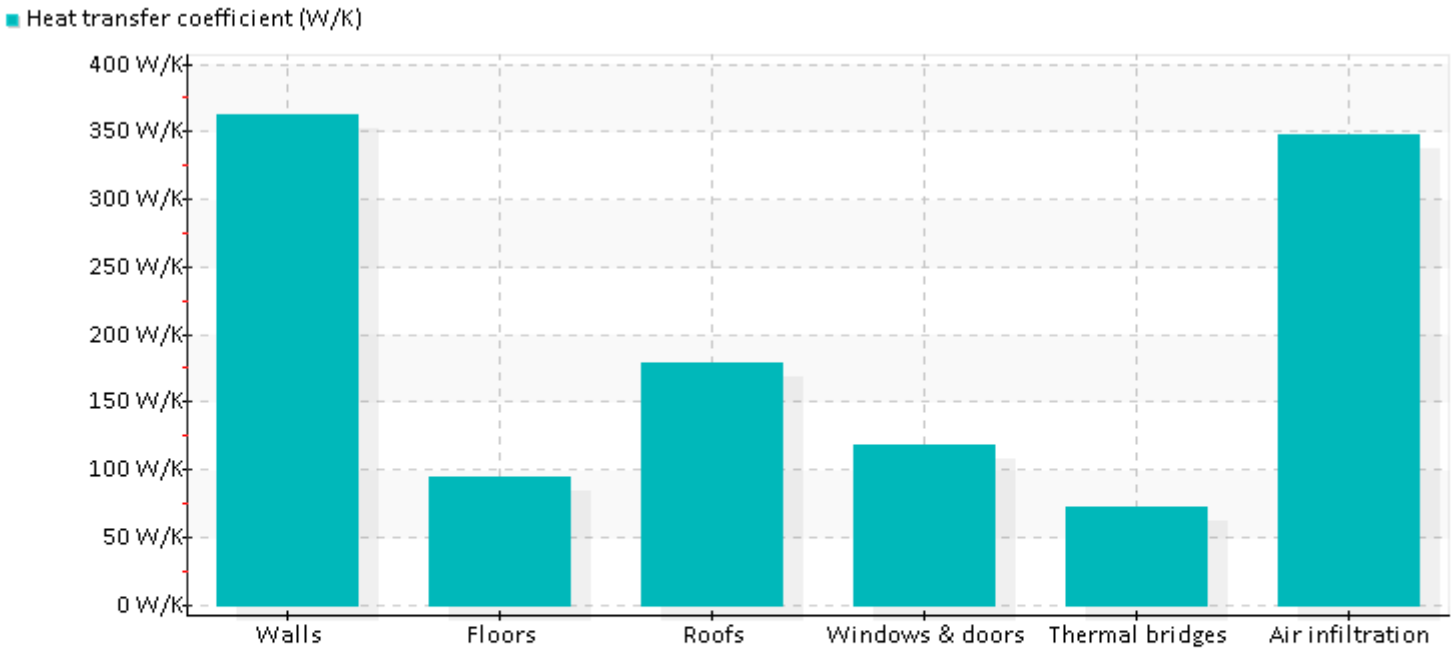
Modelled Mean Internal Temperature: [°C] with Pre 98 oil non-condensing boiler:



	Modelled average internal temperature (°C)		
Time period	Living room	Rest of dwelling	Whole dwelling
JAN	17.09	15.47	11.68
FEB	17.29	15.69	12.08
MAR	17.82	16.22	13.25
APR	18.44	16.89	14.59
MAY	19.32	17.79	16.55
JUN*	20*	18.46*	18.1 *
JUL*	20.52*	18.91*	19.28 *
AUG*	20.47*	18.89*	19.16 *
SEP*	19.77*	18.23*	17.55 *
OCT	18.81	17.26	15.4
NOV	17.79	16.21	13.15
DEC	17.2	15.6	11.87
Heating Season Average (OCT-MAY)	17.97	16.39	13.57

*Note that summer temperatures are not reliable - the calculation works on the basis of there being a heating requirement.

Heat losses from this dwelling



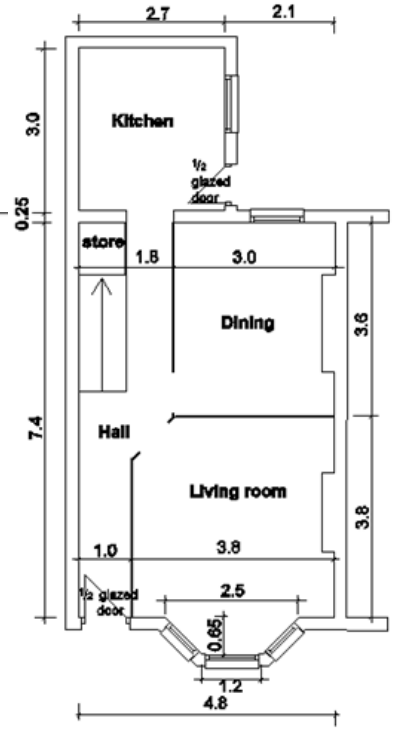
Heat loss element	Heat transfer coefficient (W/K)
Walls	364
Floors	96
Roofs	180
Windows & doors	120
Thermal bridges	74
Air infiltration	349
TOTAL	**1183**

Summary of heating data for individual rooms

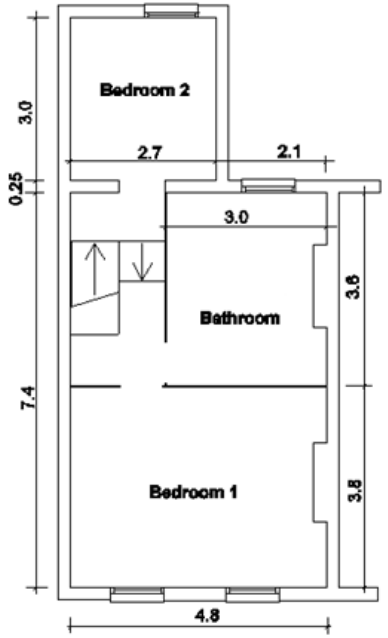
Room	Design Heat Loss (Watts)	Installed radiator/heater output (Watts)	Required storage heater capacity (kWh)
Living Room	2688	2022	48.6
Bedroom 1	1883	1707	36.5
Bedroom 2	1229	870	26.6
Total for rooms assessed	5800	4599	111.7

Case Study – ‘Typical 3 bed semi

- Storage heaters £288 more expensive per year than gas
- On peak electric heaters £800 more expensive per year than gas
- As loft insulation is good, most heatloss is through the walls
- Approximate SAP rating of 29 (F) with on peak electric heaters and 66 (D) with gas



Ground floor



First floor

Main uses

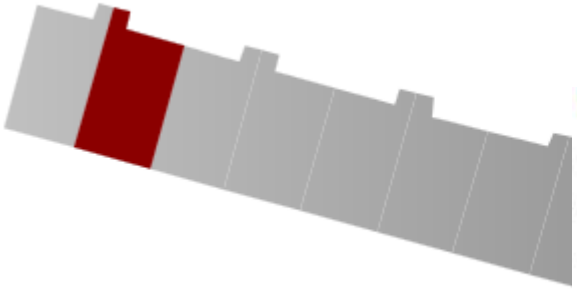
- A tool that can be used for both proactive and enforcement work
- Useful in determining and supporting the most appropriate course of action
- Can be used to determine if remedial actions are cost-effective
- Results can be re-run with modifications to test scenarios of insulation and heating system improvements
- Additional data covering CO_2 emissions and modelled internal temperatures

Main uses

- Allows assessment of heat loss from individual rooms if it is felt that existing heating is inadequate
- The calculator produces information that would usually take a lot more time to put together. And it does it specifically for the dwelling

Case creation from postcode

BRE Excess Cold Calculator



Property age [?]

- ○ Pre 1900
- ○ 1900-1929
- ○ 1930-1949
- ○ 1950-1966
- ○ 1967-1975
- ◉ 1976-1982
- ○ 1983-1990
- ○ 1991-1995
- ○ 1996-2002
- ○ 2003-present

selected property:

Mid Terrace House
1976-1982

Number of storeys 2

Number of bedrooms [?] 2

Main heating fuel [?]

○ Electricity ◉ Mains gas ○ LPG ○ Heating oil ○ Solid fuel

Project Results

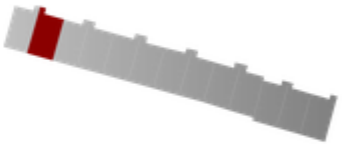
BRE Excess Cold Calculator

CASE RESULTS

Choose one of the following actions:

Back to Case details | create new PDF report

BRE XCC Report [+/-]



Case name: 28 SHIRLAND MEWS_1472199315
Dwelling Type: Not HMO
Dwelling area: 60.17 m^2
Current system: Post 98 mains gas non-condensing boiler
Address 1: 28 SHIRLAND MEWS
Address 2: LONDON
Post Town: LONDON
Post Code: W9 3DY

Annual Energy Costs with Post 98 mains gas non-condensing boiler and best current Electricity and Gas tariff:

Electricity:	Gas:	
EDF Energy	EDF Energy	
EDF Energy Simply Fixed May17	EDF Energy Simply Fixed May17	Total cost = £662.67
£363.86	£298.81	View more tariffs

https://uat.excesscold.com/

Costs

Type of subscription	Small	Medium	Large
Dwelling totals	<40,000	40,000–90,000	>90,000
Annual subscription	£500	£1,000	£1,500
Users	Unlimited	Unlimited	Unlimited

Any Questions?

Christopher.Johnes@bre.co.uk