

Decarbonising the Welsh housing stock

Christopher Jofeh

Monday 10 July 2023



Friends of the Earth Cymru
Cyfeillion y Ddaear Cymru





Source: Florence Collier,
Humblebee

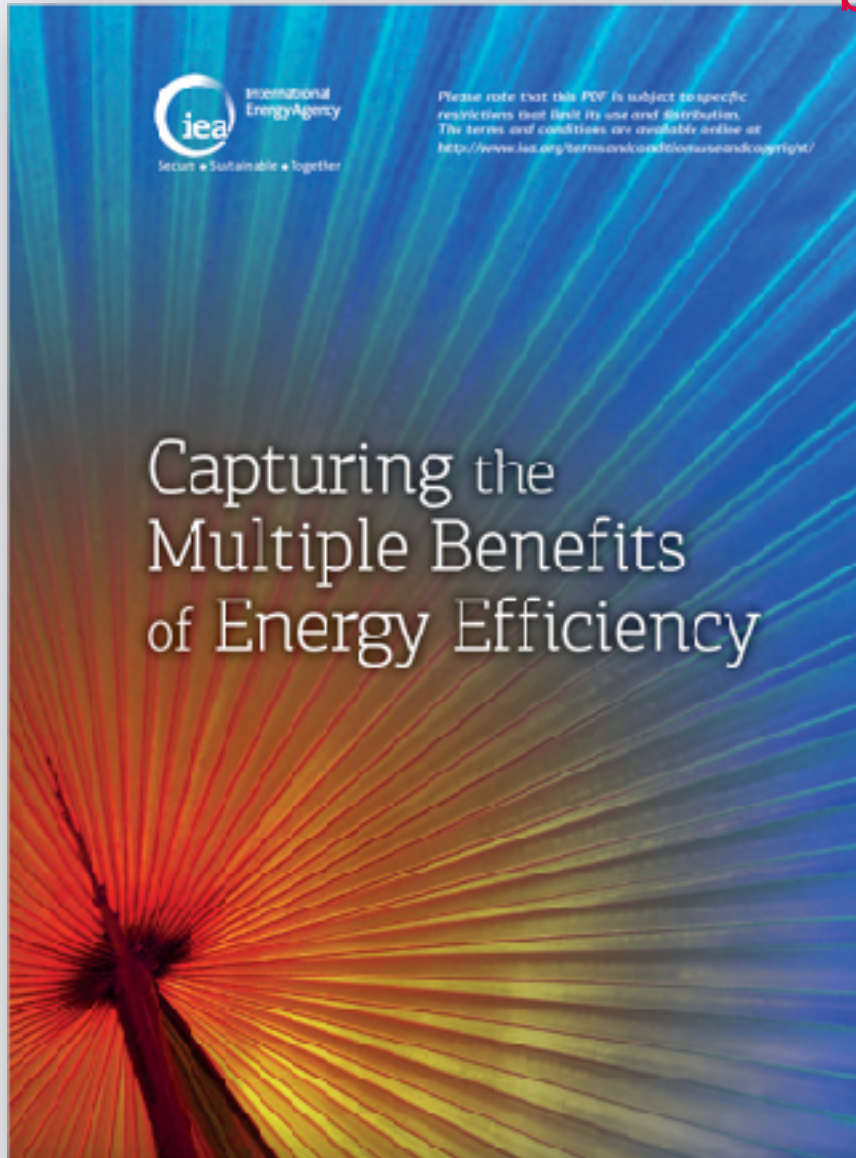
Proportion of net GHG emissions by sector



Tenure of Wales's 1.4 million homes

Owner-occupied	Privately rented	Rented from housing associations	Rented from local authorities
70%	14%	10%	6%

Multiple benefits



The Health Impacts of Cold Homes and Fuel Poverty

Marmot Review Team



Marmot Review
Team

Home advantage

Unlocking the benefits
of energy efficiency



June 2023

Wales's Optimised Retrofit Programme



Welsh Parliament
Climate Change, Environment, and Infrastructure Committee

Decarbonising the private housing sector

February 2023



senedd.wales

Welsh residential GHG emissions in kT per year

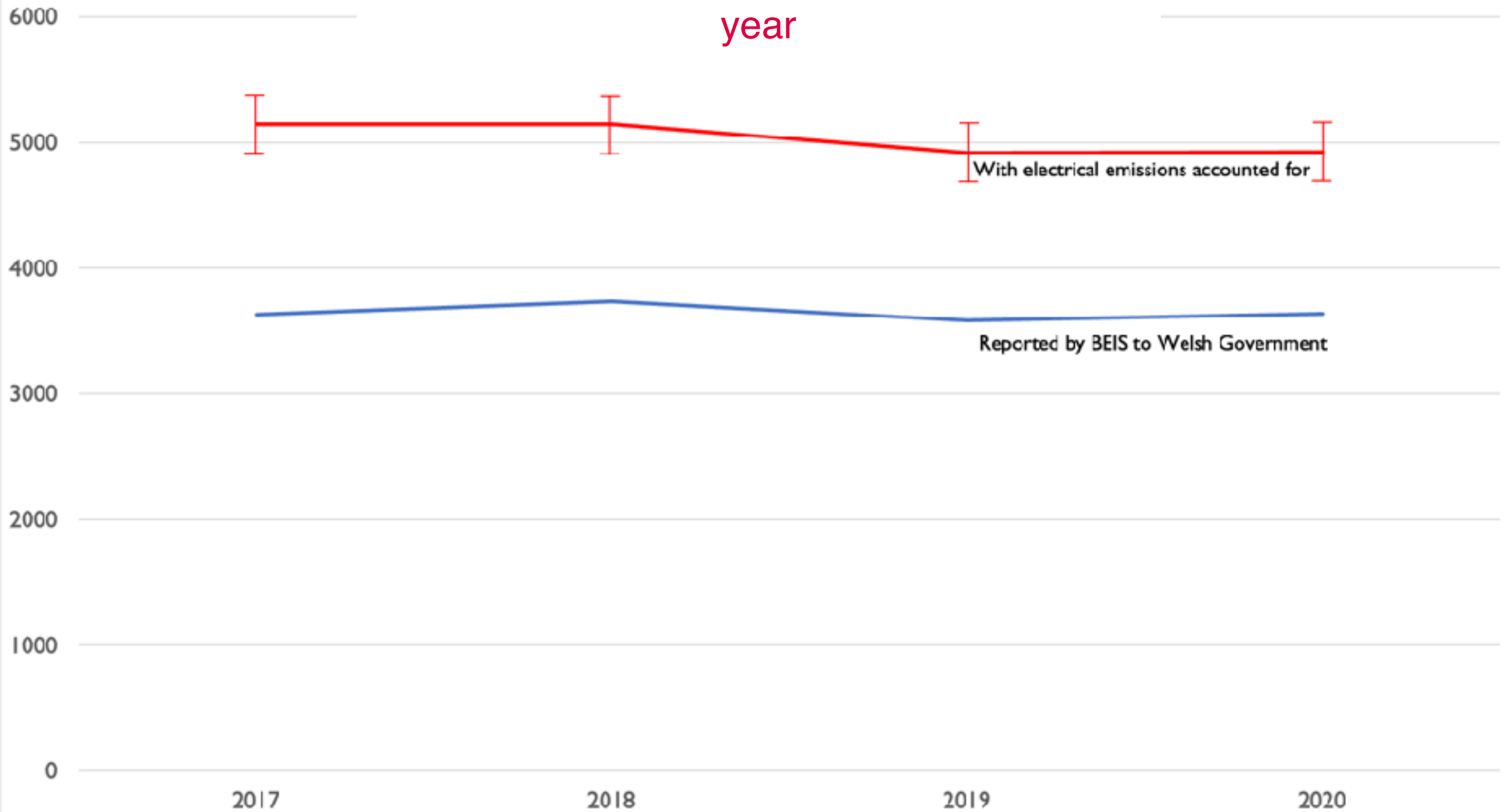
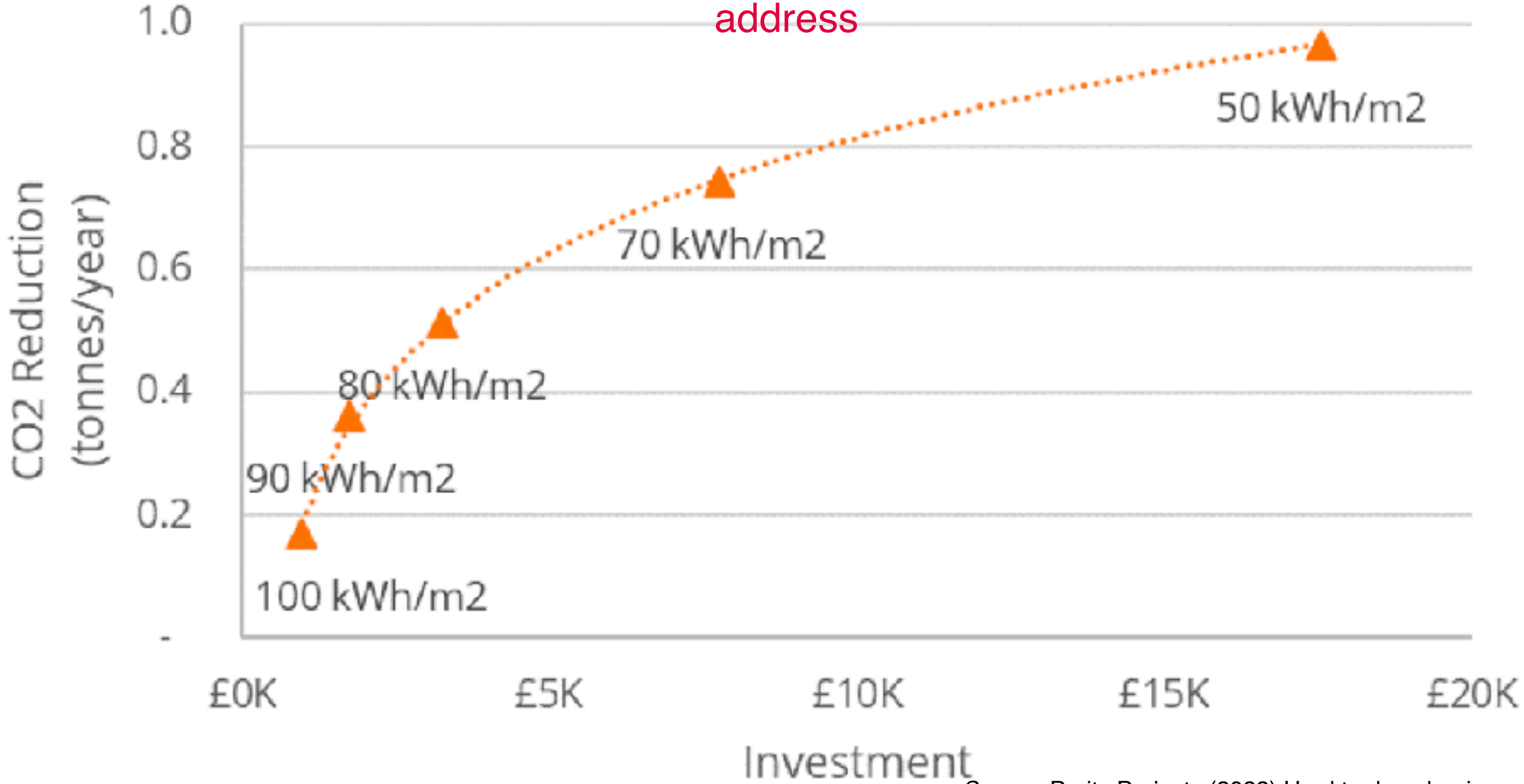




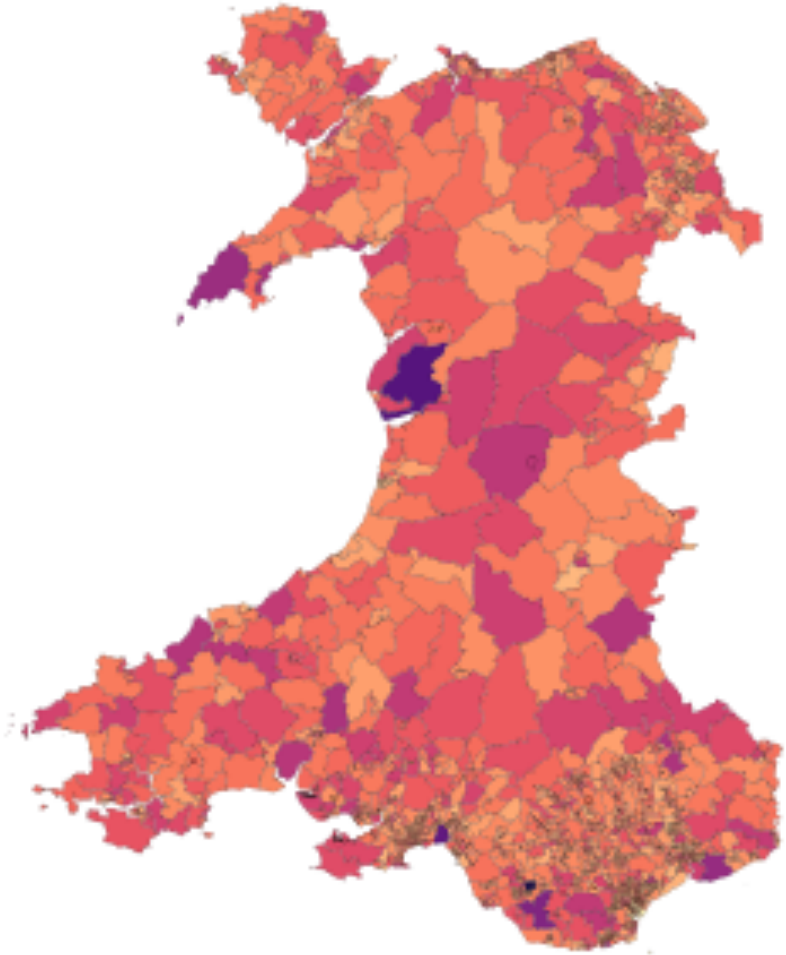
Image: © 2021 Christopher Infab

Annual CO₂ reduction against investment of various retrofit packages for one example address

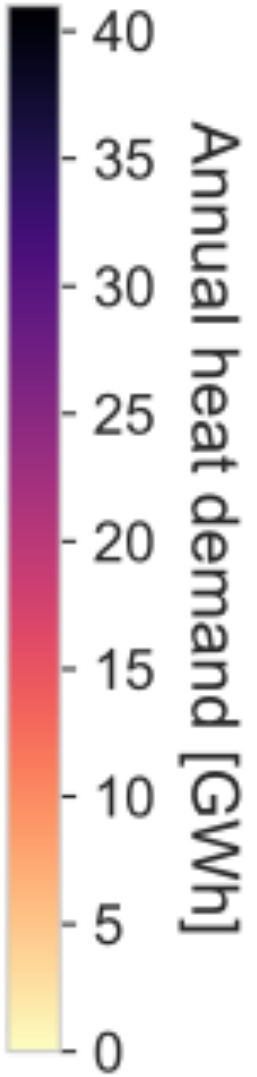
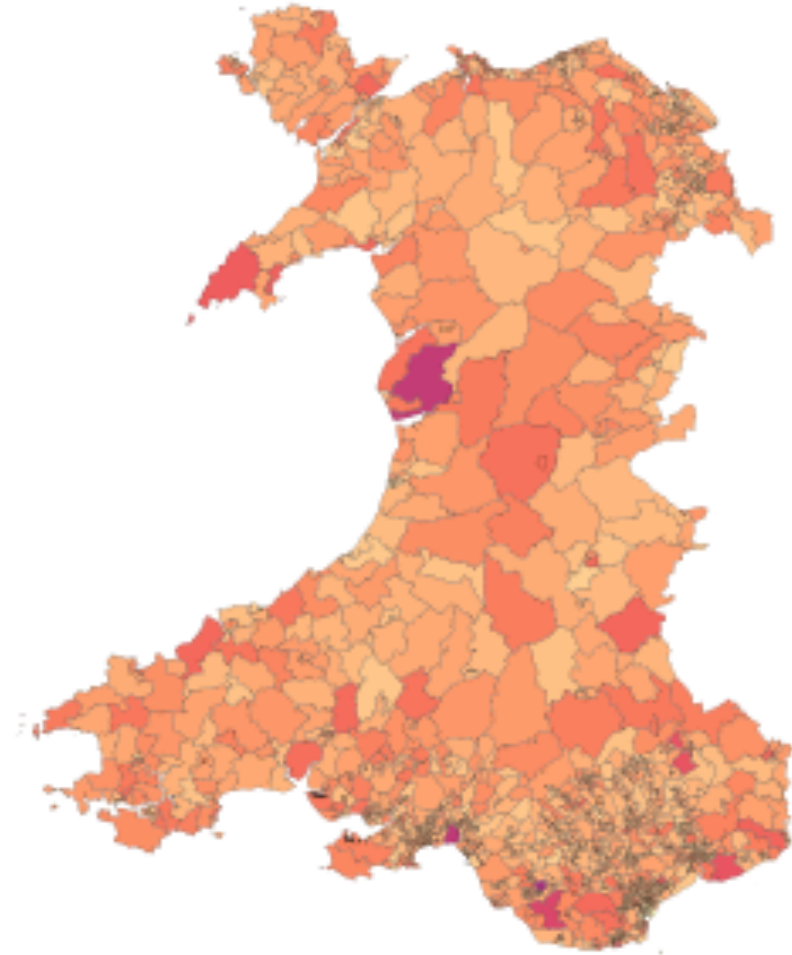


Source: Parity Projects (2022) Hard to decarbonise social

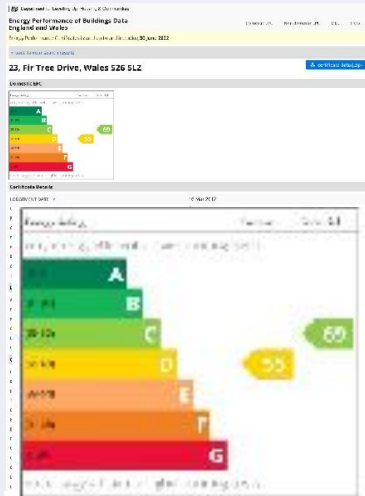
Annual heat demand before energy efficiency measures by LSOA



Annual heat demand after energy efficiency measures by LSOA



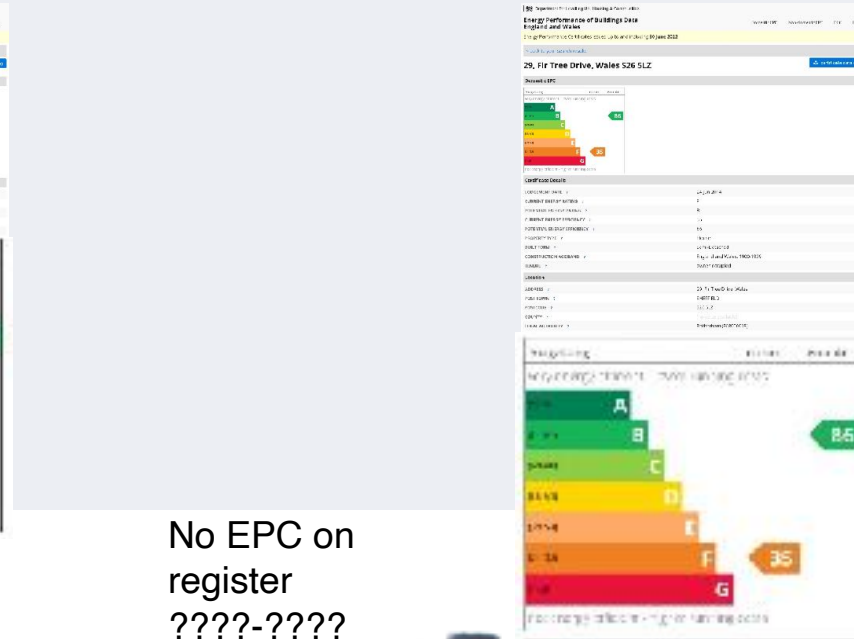
Quality of EPCs



1967-1975



1950-1966



No EPC on register
????-????

1900 -1929



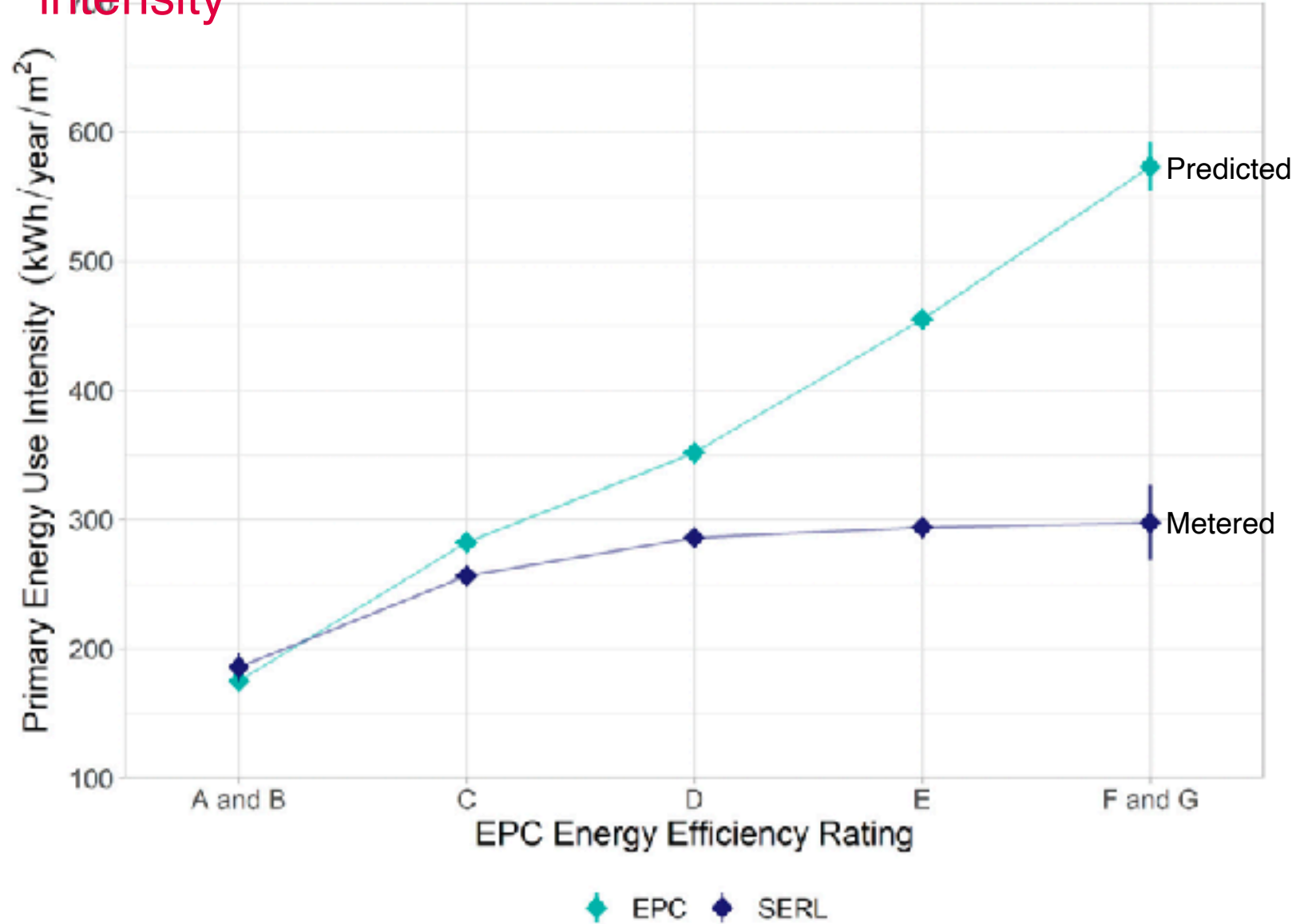
1950-1966



1950-1966



EPC-modelled and metered primary energy use intensity



Homes

of today for tomorrow

Decarbonising Welsh Housing between 2020 and 2050

Stage 3: Decarbonising social housing

Ed Green and Simon Lamon, Welsh School of Architecture, Cardiff University _ Issue: 15.09.2020

	HOUSE End terrace	HOUSE Mid terrace	HOUSE Semi- detached	HOUSE Detached	FLAT (Purpose built)	Total
pre 1919	0%	2%	1%	0%	2%	5%
1919- 1944	2%	3%	5%	0%	1%	11%
1945- 1964	3%	5%	12%	0%	8%	29%
1965 - 1990	5%	7%	5%	0%	19%	36%
post 1990	1%	2%	6%	1%	9%	2%
Total	11%	20%	29%	1%	39%	82%

case study 03:

Semi-detached house, 1945-64 Carmarthenshire County Council

Headlines:

- **True cost of decarb, poor quality house**
- **An off-gas dwelling**
- **A motivated tenant**



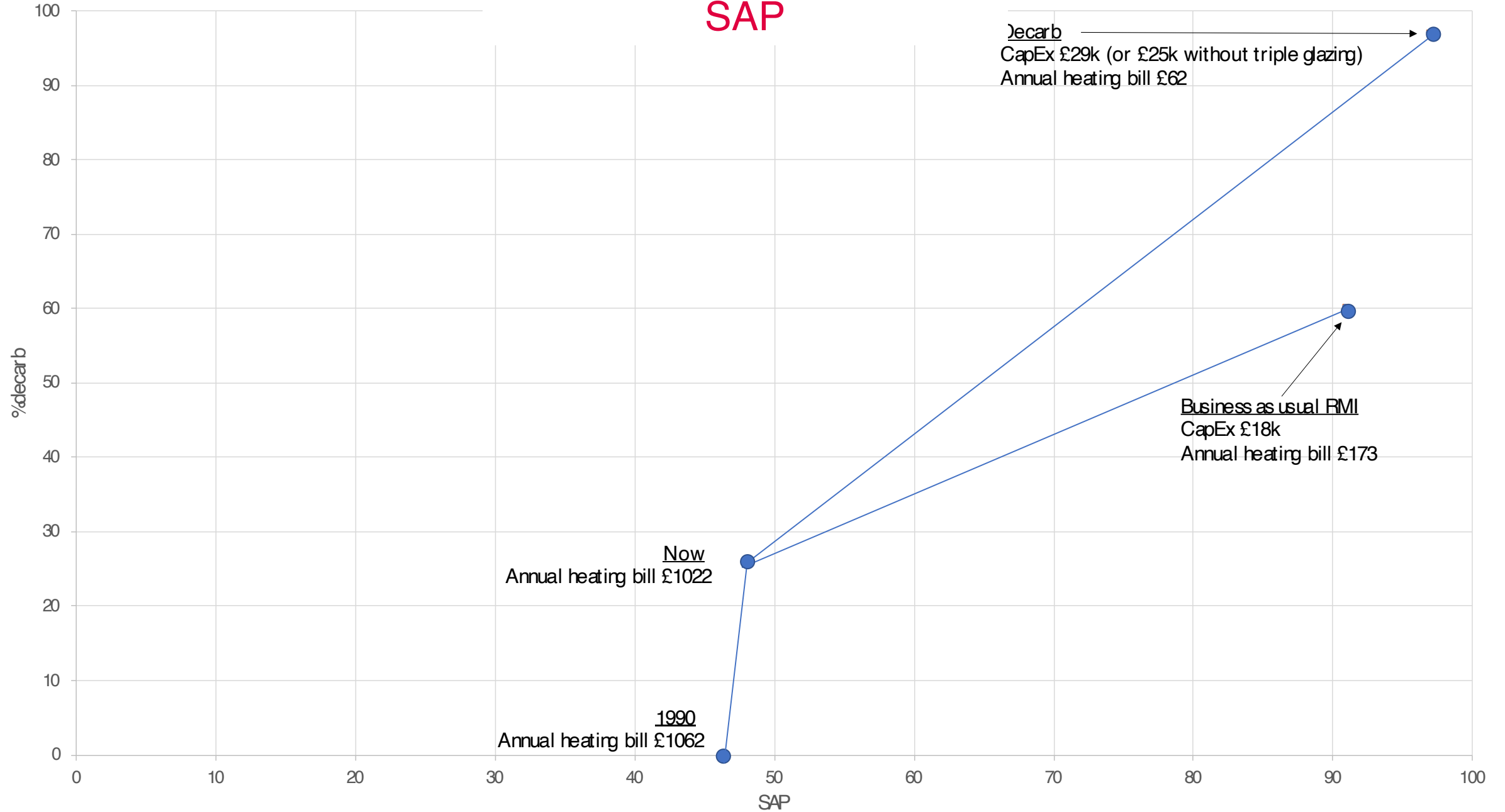
Anticipated RMI

component:	specification	likely cost
Walls	External Wall Insulation 100mm	£2,957
roof	topped up to 300mm	£714
floor	No upgrade	
window, door	Standard high performance (upvc)	£3,664
Heating, hot water	Oil-fired boiler, wet central heating	£4,090
Airtightness, vent	Normal practice	
renewables	PV 4kWp	£7,000
Total cost		£18,425

Decarbonisation retrofit

component:	specification	likely cost
Walls	External Wall Insulation 150mm	£3,475
roof	topped up to 300mm	£714
floor	50mm over-floor insulation	£1,785
window, door	Triple Glazing composite (timber)	£7,328
Heating, hot water	Air Source Heat Pump	£8,180
Airtightness, vent	Best practice without MVHR	£739
renewables	PV 4kWp	£7,000
Total cost		£29,221

Case study 3: %decarb vs SAP



Better Homes, Better Wales, Better World

Decarbonising existing homes in Wales

Report to Welsh Ministers from the Decarbonisation
of Homes in Wales Advisory Group

18 July 2019

Cartrefi Gwell, Cymru Well, Byd Gwell

Datgarboneiddio cartrefi presennol
yng Nghymru

Adroddiad i Weinidogion Cymru gan y Grŵp Cynghori
ar Ddatgarboneiddio Cartrefi yng Nghymru

18 Gorffennaf 2019

Summary of Recommendations

1. **Political parties in Wales should make a strategic commitment to national residential decarbonisation and stick to it**
2. **The Welsh Government should set ambitious housing targets to meet its ambition of achieving net zero carbon by 2050**
3. **The Welsh Government should put in place the right quality system and delivery mechanisms across all tenures to help achieve the targets**
4. **The Welsh Government, working with others, should develop a holistic package of support across all tenures to motivate and facilitate action**
5. **The Welsh Government should collect data about the status and condition of the housing stock to inform future decisions and measure progress towards targets**
6. **The Welsh Government should continue to monitor and test new solutions to decarbonise homes**
7. **The Welsh Government and its partners should make maximum use of communities, networks, associations and Third Sector organisations in helping to decarbonise homes**



Llywodraeth Cymru
Welsh Government

Conservation Area Appraisals

Article last updated: 20th August 2020

The following Conservation Area Appraisals have been approved by Single Cabinet Member on 23rd March 2016 and the amendments to the boundaries come into force on 31st March 2016. The documents have been approved as Supplementary Planning Guidance.

- [Abergavenny Conservation Area Appraisal](#)
- [Caerwent Conservation Area Appraisal](#)
- [Chepstow Conservation Area Appraisal](#)
- [Grosmont Conservation Area Appraisal](#)
- [Llanarth Conservation Area Appraisal](#)
- [Llandenny Conservation Area Appraisal](#)
- [Llandogo Conservation Area Appraisal](#)
- [Llanover Conservation Area Appraisal](#)
- [Llantilio Crossenny Conservation Area Appraisal](#)
- [Magor Conservation Area Appraisal](#)
- [Mathern Conservation Area Appraisal](#)
- [Monmouth Conservation Area Appraisal](#)
- [Raglan Conservation Area Appraisal](#)
- [Shirenewton Conservation Area Appraisal](#)
- [St Arvans Conservation Area Appraisal](#)
- [Tintern Conservation Area Appraisal](#)
- [Usk Conservation Area Appraisal](#)
- [Whitebrook Conservation Area Appraisal](#)



Address: County Hall, The Rhadyr, Usk, NP15 1GA

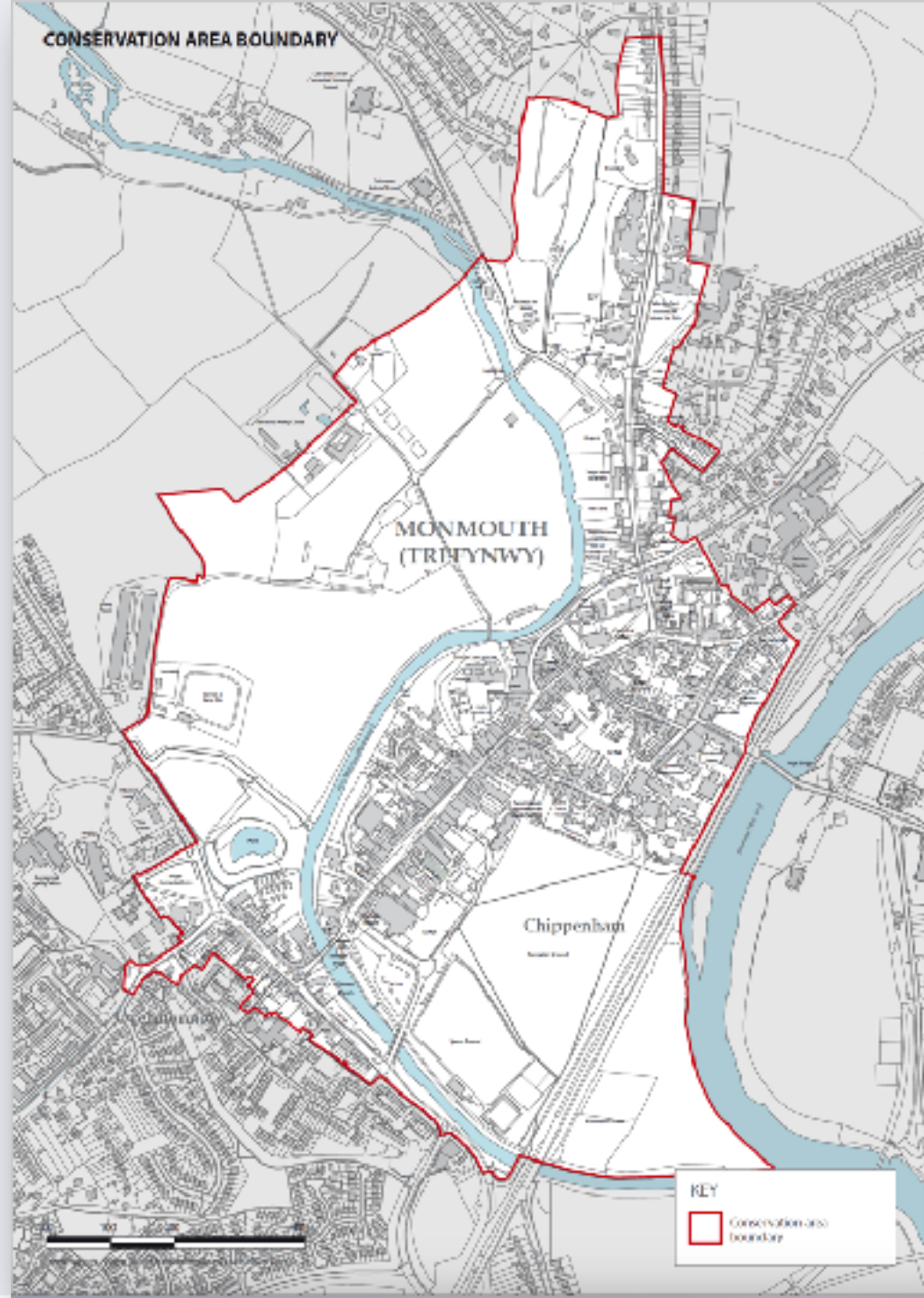
Contact Us

Telephone: 01633 644644

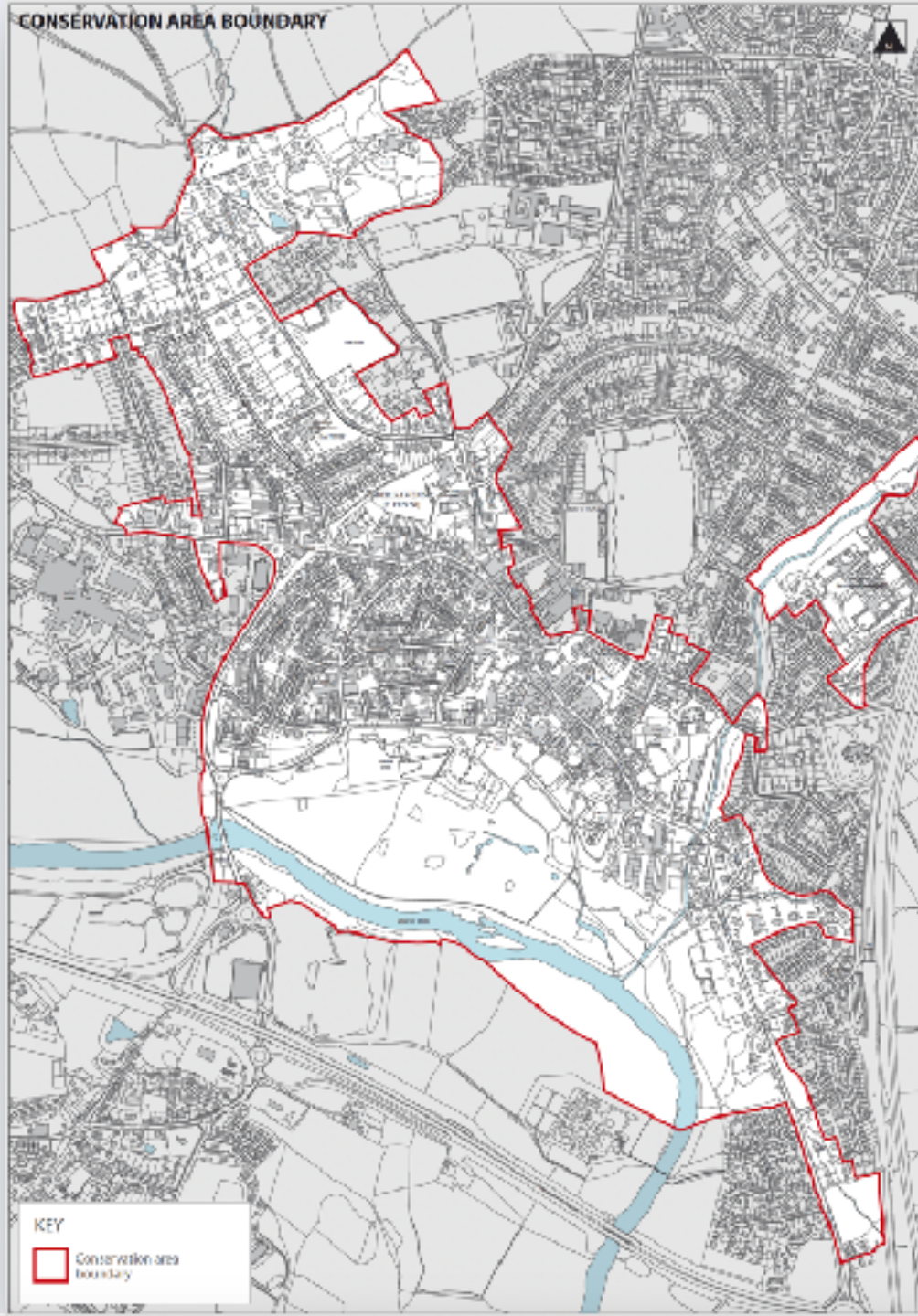
Email: contact@monmouthshire.gov.uk

[Privacy Notice](#)

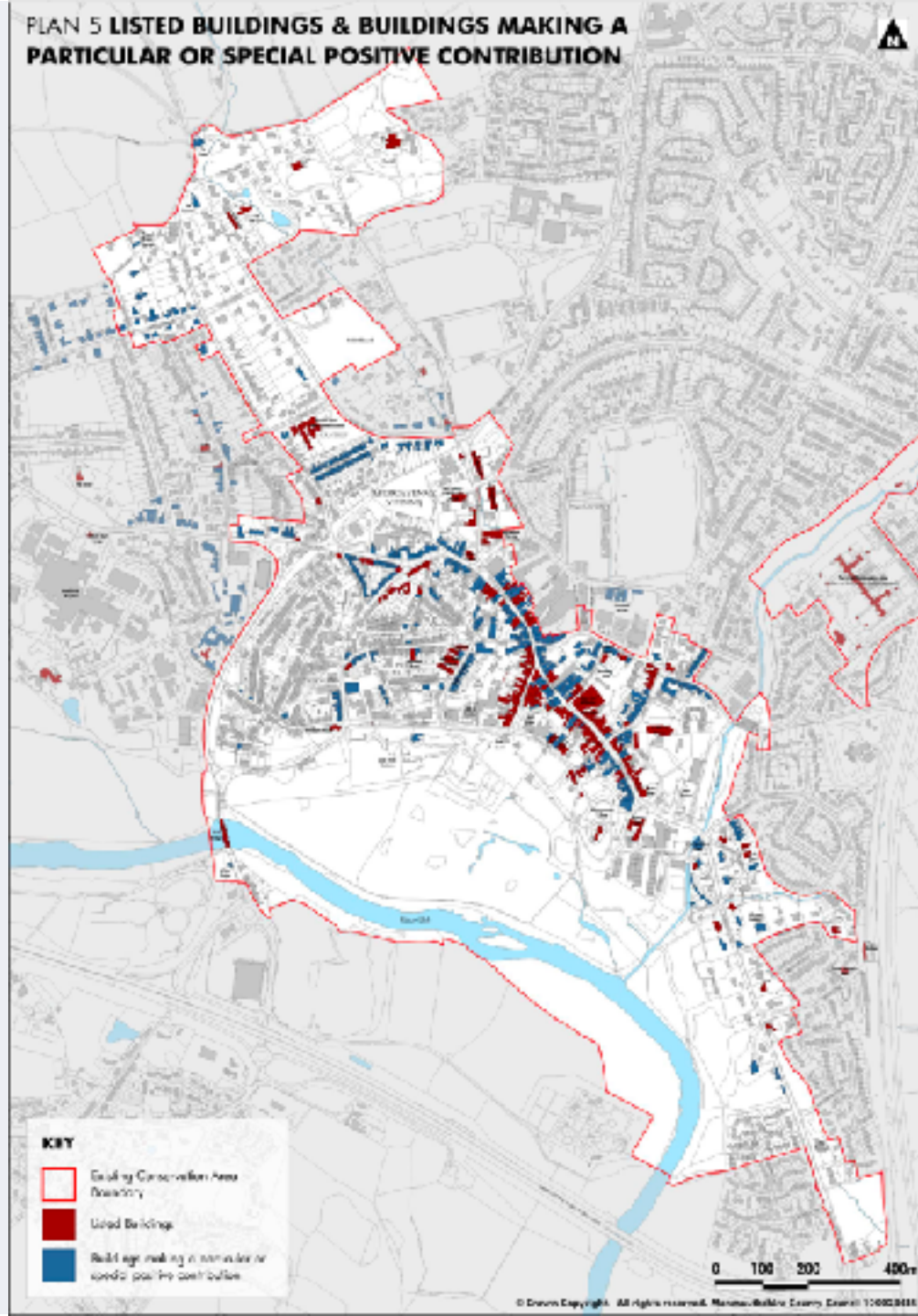
CONSERVATION AREA BOUNDARY






CONSERVATION AREA BOUNDARY

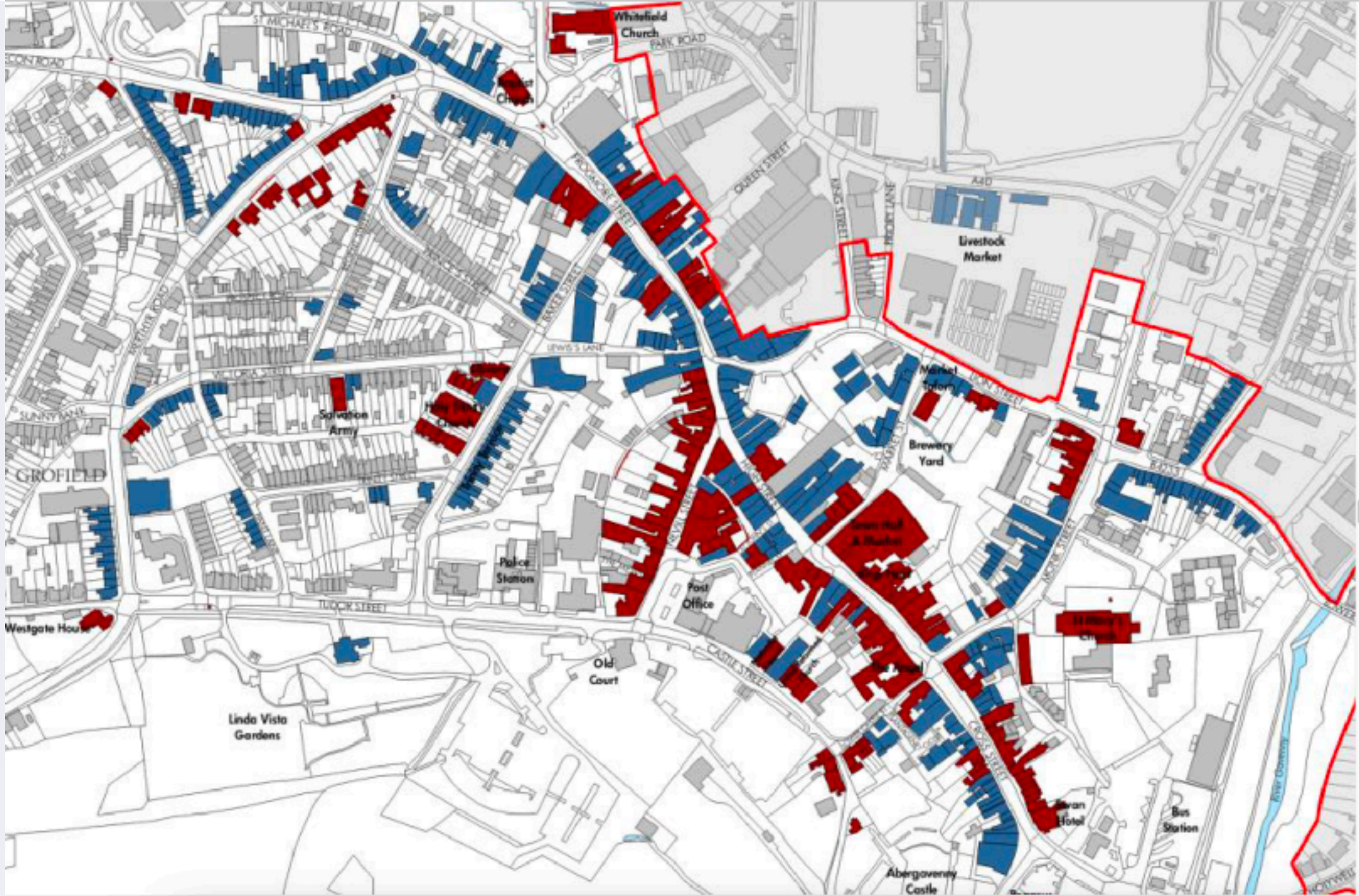


PLAN 5 LISTED BUILDINGS & BUILDINGS MAKING A PARTICULAR OR SPECIAL POSITIVE CONTRIBUTION



KEY

-  Building Conservation Area Boundary
-  Listed Buildings
-  Buildings making a particular or special positive contribution





Blue street sign with illegible text.



KINGS
ARMS
hotel

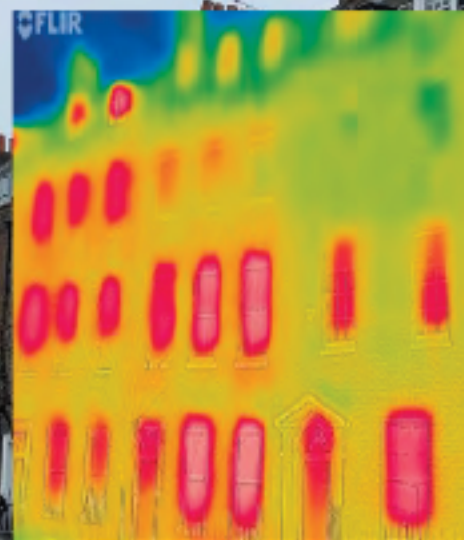


Blue sign with white text, likely providing information about the building or the area.

Google

Climate Emergency Conservation Area Toolkit - England

A methodology to Audit Conservation Areas for Climate Emergency Housing Retrofit with a worked Conservation Area case study.

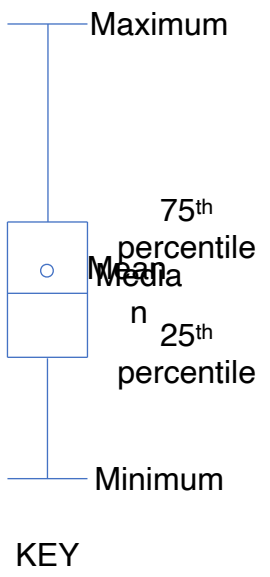
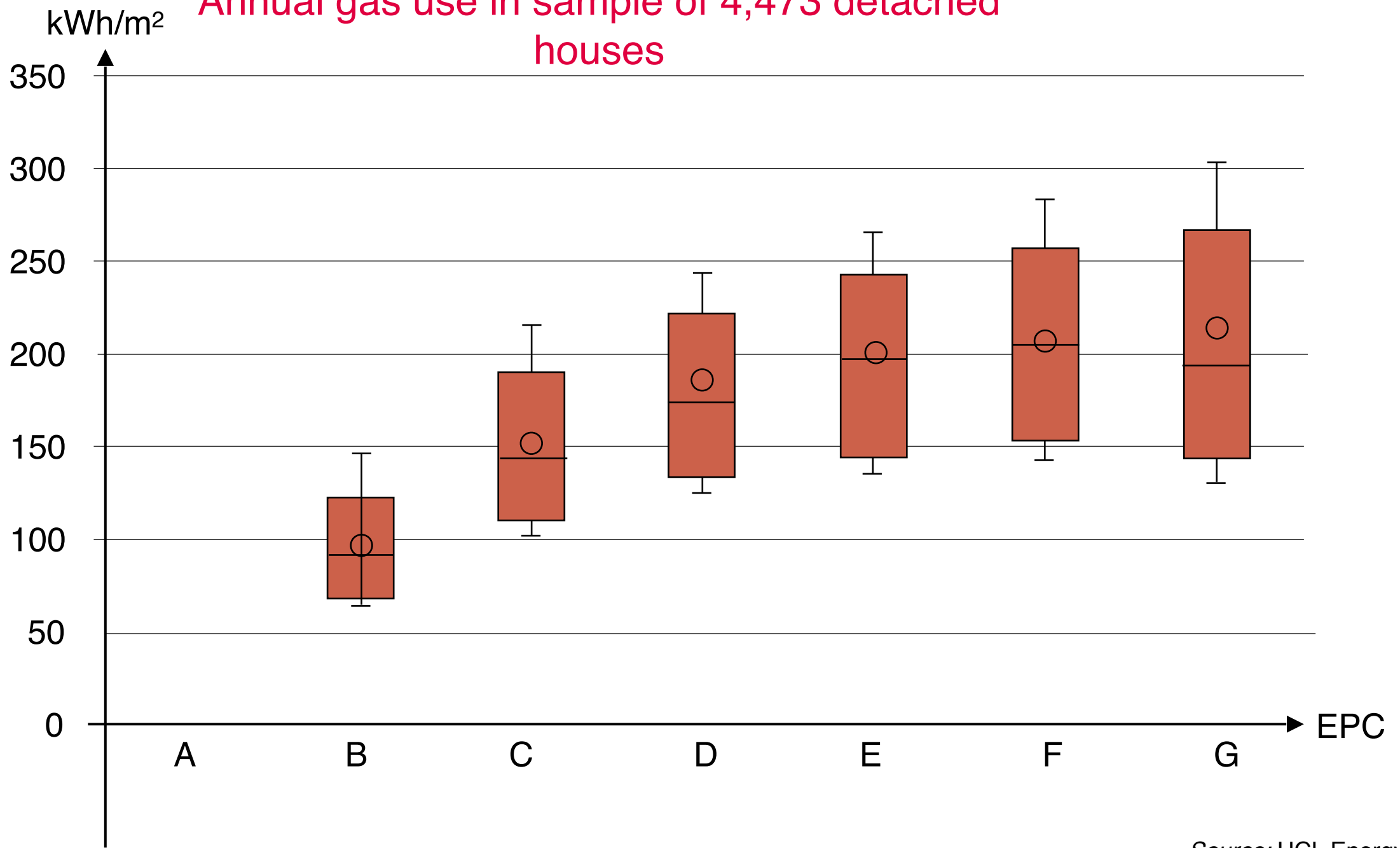


A report for politicians and policymakers
Architects Climate Action Network
28 November 2022

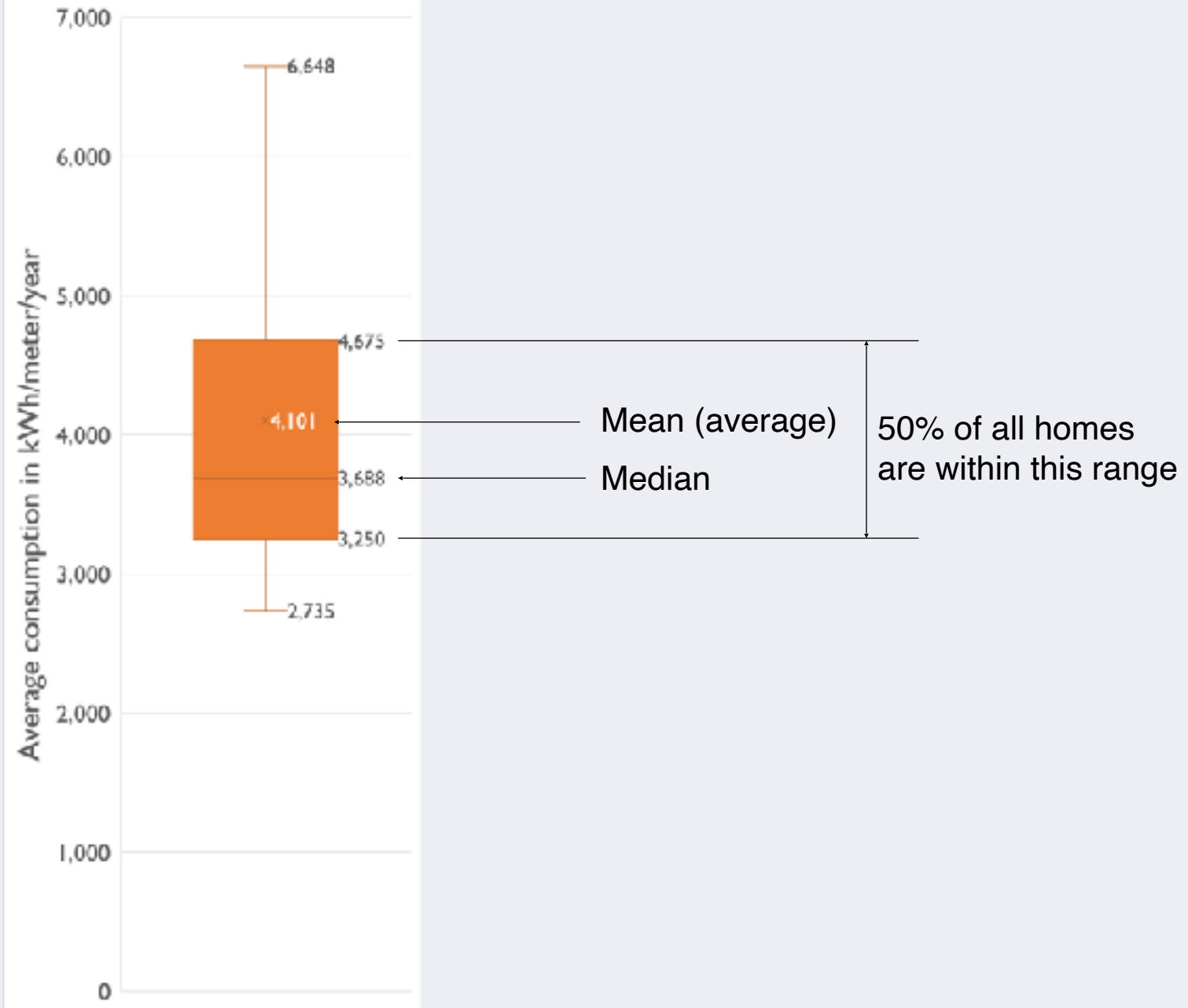
	HOUSE End terrace	HOUSE Mid terrace	HOUSE Semi-	HOUSE Detached	FLAT (Purpose blt)	Total
pre 1919	type 1, 3%	type 2, 9%	type 3, 4%	type 4, 7%		23%
1919- 1944			type 5, 5%			5%
1945- 1964			type 6, 10%			10%
1965 - 1990	type 7, 4%	type 8, 6%	type 9, 10%	type 10, 9%	type 11, 4%	33%
Post 1990			type 12, 5%	type 13, 7%	type 14, 1%	13%
Total	7%	15%	34%	23%	5%	84%

Source: Green, E., Lannon, S., Patterson, J. & Iorwerth, H. (2019). *Homes of today for tomorrow Decarbonising Welsh Housing between 2020 and 2050 STAGE 2: Exploring the potential of the Welsh housing stock to meet 2050 decarbonisation targets*. Welsh School of Architecture.

Annual gas use in sample of 4,473 detached houses



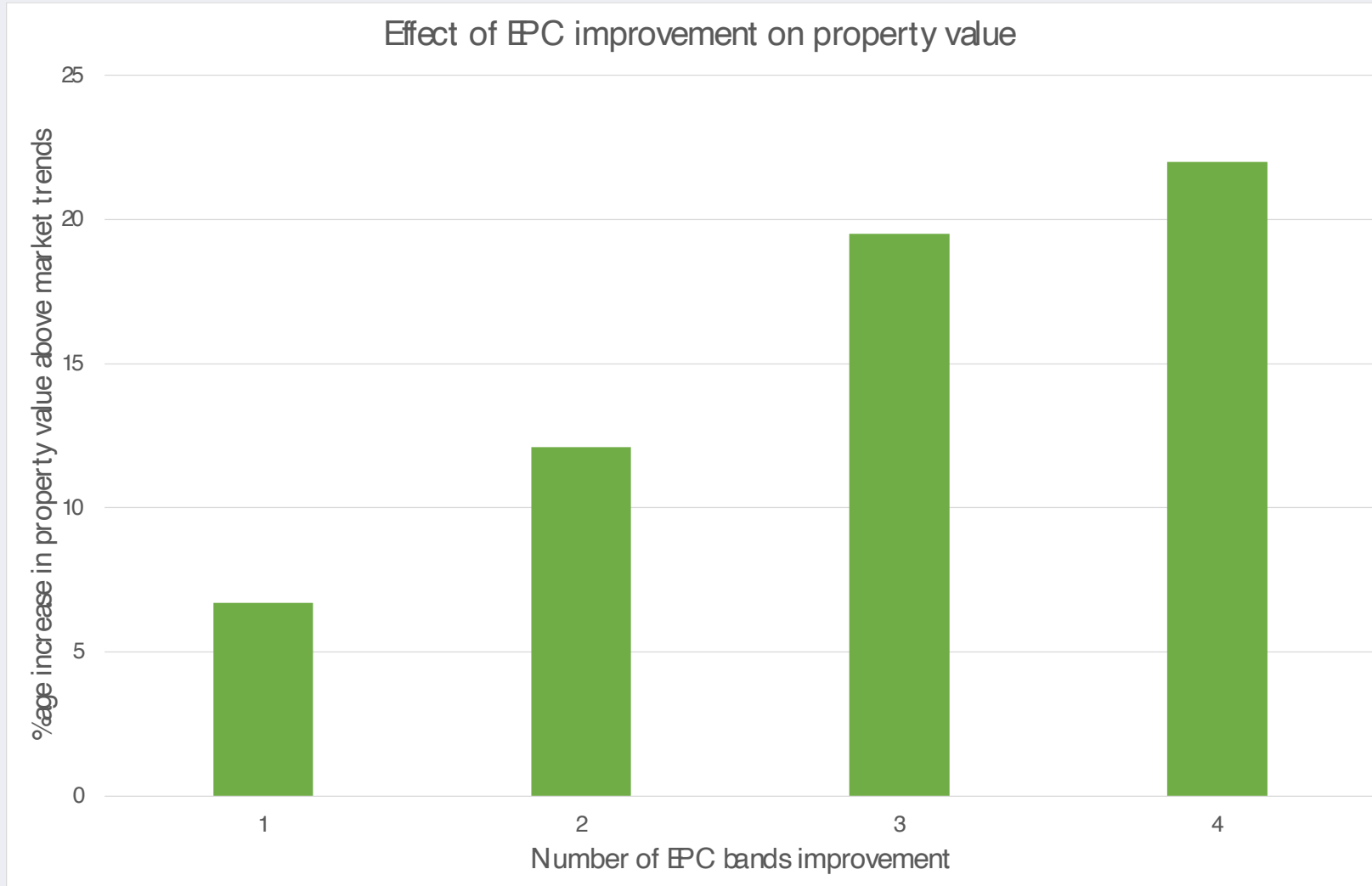
Residential electricity consumption in Monmouthshire in 2021



PAS 2035 accredited retrofit assessor



VALUER project





Diolch
Thank you
chris.jofeh@arup.com

Source: Senedd Home – archive of the fifth
Senedd

Low-cost things Welsh Government should be getting on

1. Change the 3m rule concerning ASHP installation. **with**
2. Commission and publish guidance about when it is appropriate to install a heat pump.
3. Commission studies to help determine better energy efficiency targets than EPC 'C'. Follow CCC guidance on the use of better metrics.
4. Commission the completion of work began during the preparation of *Better Homes, Better Wales, Better World* that uses an established behavioural science framework (COM-B) to identify what is needed to create an enabling environment for residential decarbonisation.
5. Commission work to assess correct residential and other sectoral emissions.
6. Create with others and implement a residential retrofit quality regime.
7. Engage with BEIS for access to smart meter data.
8. Identify homes whose decarbonisation cost is not matched by an increase in property value or whose owners cannot afford to carry out the work.
9. Initiate data collection about every home.
10. Introduce MEES-like regs covering holiday lets and second homes.
11. Introduce Variable Land Transaction Tax.
12. Make maximum use of communities, networks, associations and third sector organisations to help decarbonise homes.
13. Planning – mandate and fund conservation area Local Development Orders.
14. Share ORP data with UCL's Smart Energy Research Lab.
15. Vastly improve communications with the public.
16. Work with others to identify and create financial solutions for all tenures.

Ways to reduce residential energy consumption

Draft proof doors and windows, but ensure adequate ventilation

Install a more efficient heating system

Install LED lighting

Install photovoltaic panels with batteries

Install wall and roof insulation

Replace single glazing with double glazing or add secondary glazing

Upgrade domestic appliances to more efficient models