Saltash Town Council

Konsel An Dre Essa

The Guildhall
12 Lower Fore Street
Saltash
PL12 6JX
Telephone: 01752 844846
www.saltash.gov.uk

10 July 2024

Dear Councillor

I write to summon you to the **Meeting of the Planning and Licensing Committee** to be held at the Guildhall on **Tuesday 16th July 2024 at 6.30 pm**.

The meeting is open to members of the public and press. Members of the public wishing to speak about a planning application should register either by email to enquiries@saltash.gov.uk or via The Guildhall, 12 Lower Fore Street, Saltash PL12 6JX, **no later than 12 noon the day before the meeting** where the application will be considered.

Planning applications can be viewed by Members of the Council prior to the meeting on the Cornwall Council's website www.cornwall.gov.uk. Members of the public may view planning applications online during normal working hours of 9:30 a.m. to 4:30p.m. at the Saltash Library Hub.

Yours sincerely,

S Burrows
Town Clerk/RFO

To:

Essa	**Tamar**	**Trematon**
R Bickford	J Dent	S Miller
J Brady (Vice-Chairman)	S Gillies	B Samuels (Chairman)
R Bullock	S Martin	B Stoyel
J Foster	L Mortimore	D Yates
M Griffiths	J Peggs	
S Lennox-Boyd	P Samuels	

Agenda

1. Health and Safety Announcements.

2. Apologies.

3. Declarations of Interest:

   a. To receive any declarations from Members of any registerable (5A of the Code of Conduct) and/or non-registerable (5B) interests in matters to be considered at this meeting.

   b. The Town Clerk to receive written requests for dispensations prior to the start of the meeting for consideration.

4. Public Questions - A 15-minute period when members of the public may speak about a planning application.

   Please note: Any member of the public requiring to speak about a planning application should register by email **no later than 12 noon the day before the meeting** where the application will be considered.

   Members of the public are advised to review the Receiving Public Questions, Representations and Evidence at Meetings document prior to attending the meeting.

5. To receive and approve the minutes from the Planning and Licensing Committee held on Tuesday 18 June 2024 as a true and correct record. (Pages 5 - 9)

6. To consider Risk Management reports as may be received.

7. Planning:

   a. To note that Councillor Lennox-Boyd will vote upon the information before her at the meeting but in the light of subsequent information received at Cornwall Council, Councillor Lennox-Boyd may vote differently at that meeting.

   b. To note that if Councillor Lennox-Boyd wishes to recommend opposite to the Town Council's view she will contact the Town Council by email. Considering time constraints, the Town Council will then hold an online poll of Councillors to determine whether to accept the Officer's view or to ask for the application to be called into committee. The results of these polls will be read into the record at the next Town Council meeting. Members of the public may request, via the Clerk, to be copied into any correspondence.

c. Applications for consideration:

PA24/04422
Paul and Susannah Melling – **39 Lower Port View St Stephens Saltash PL12 4BY**
Dormer extension, including building over the existing garage.
Ward: Essa
Date received: 19/06/24
Response date: 19/07/24
https://planning.cornwall.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=SEM8KYFGMAS00

PA24/04655
Mr & Mrs A Stone – **29 Longmeadow Road Saltash PL12 6DP**
Proposed alterations and roof conversions to dwelling.
Ward: Tamar
Date received: 26/06/24
Response date: 17/07/24
https://planning.cornwall.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=SF2D04FG1W400

PA24/04841
Mr & Mrs S Carew – **Morhild North Park Villas Saltash PL12 6LP**
Extension to dwelling.
Ward: Tamar
Date received: 02/07/24
Response date: 23/07/24
https://planning.cornwall.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=SFF8ZDFGHTN00

PA24/04871
Mr Nathan Jones – **25 Callington Road Saltash PL12 6DU**
Replacement detached garage.
Ward: Essa
Date received: 05/07/25
Response date: 26/07/24
https://planning.cornwall.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=SFH0ZNFGJ5G00

PA24/04937
Mr Jason Gibbs British Energetics – **Spinnaker International Spinnaker House Latchbrook Parkway Industrial Estate Long Acre PL12 6LF**
Proposed wildlife pond with associated re-contouring works and landscape enhancements.
Ward: Tamar
Date received: 09/07/24
Response date: 30/07/24
https://planning.cornwall.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=SFN4C5FGFK900

8. To receive Cornwall Council's consultation re Stopping up of a section of the highway at Treledan, Saltash and consider any actions. (Pages 10 - 17)

9. To receive Cornwall Council's consultation re The Statement of Principles - Gambling Act 2005 and consider any actions. (Pages 18 - 79)

10. To receive Cornwall Council's consultation re The Draft Cornwall Housing Decarbonisation Strategy and consider any actions. (Pages 80 - 243)

11. Public Bodies (Admission to Meetings) Act 1960:
To resolve that pursuant to Section 1(2) of the Public Bodies (Admission to meetings) Act 1960 the public and press leave the meeting because of the confidential nature of the business to be transacted.

12. To consider any items referred from the main part of the agenda.

13. Public Bodies (Admission to Meetings) Act 1960:
To resolve that the public and press be re-admitted to the meeting.

14. To confirm any press and social media releases associated with any agreed actions and expenditure of the meeting.

Date of Next Meeting: Tuesday 20 August 2024 at 6.30 pm

SALTASH TOWN COUNCIL

Minutes of the Meeting of the Planning and Licensing Committee held at the Guildhall on Tuesday 18th June 2024 at 6.30 pm

PRESENT: Councillors: J Brady (Vice-Chairman), R Bullock, J Foster, J Peggs, B Samuels (Chairman), P Samuels and B Stoyel.

ALSO PRESENT: M Thomas (Senior Policy and Data Compliance Officer) and F Morris (Planning and General Administrator).

APOLOGIES: R Bickford, J Dent, S Gillies, M Griffiths, S Lennox-Boyd, S Martin, S Miller, L Mortimore and D Yates.

26/24/25 HEALTH AND SAFETY ANNOUNCEMENTS.

The Chairman informed those present of the actions required in the event of a fire or emergency.

27/24/25 DECLARATIONS OF INTEREST:

a. To receive any declarations from Members of any registerable (5A of the Code of Conduct) and/or non-registerable (5B) interests in matters to be considered at this meeting.

None.

b. The Town Clerk to receive written requests for dispensations prior to the start of the meeting for consideration.

None.

28/24/25 PUBLIC QUESTIONS - A 15-MINUTE PERIOD WHEN MEMBERS OF THE PUBLIC MAY SPEAK ABOUT A PLANNING APPLICATION.

None.

29/24/25 **TO RECEIVE AND APPROVE THE MINUTES FROM THE PLANNING AND LICENSING COMMITTEE HELD ON TUESDAY 21ST MAY 2024 AS A TRUE AND CORRECT RECORD.**

Please see a copy of the minutes on the STC website or request to see a copy at the Guildhall.

It was proposed by Councillor B Samuels, seconded by Councillor Brady and **RESOLVED** that the minutes of the Planning and Licensing Committee held on 21st May 2024 were confirmed as a true and correct record.

30/24/25 **TO CONSIDER RISK MANAGEMENT REPORTS AS MAY BE RECEIVED.**

None.

31/24/25 **PLANNING:**

a. To note that Councillor Lennox-Boyd will vote upon the information before her at the meeting but in the light of subsequent information received at Cornwall Council, Councillor Lennox-Boyd may vote differently at that meeting.

b. To note that if Councillor Lennox-Boyd wishes to recommend opposite to the Town Council's view she will contact the Town Council by email. Considering time constraints, the Town Council will then hold an online poll of Councillors to determine whether to accept the Officer's view or to ask for the application to be called into committee. The results of these polls will be read into the record at the next Town Council meeting. Members of the public may request, via the Clerk, to be copied into any correspondence.

c. Applications for consideration:

PA24/01302
Mr & Mrs Adrian Reynard – **The Old Mill Antony Passage Saltash PL12 4QT**
Listed building consent for repair and extension to Creek retaining wall in curtilage of listed dwelling. Incorporation of new balustrading to wall top.
Ward: Trematon
Date received: 31/05/24
Response date: 21/06/24
It was proposed by Councillor Brady, seconded by Councillor Stoyel and resolved to **RECOMMEND APPROVAL.**

PA24/03457
Town Clerk Saltash Town Council – **Saltash War Memorial Station Road Saltash PL12 4DY**
Listed building consent for the installation of 2 Cornish granite benches to add names to those fallen in various conflicts.
Ward: Essa
Date received: 23/05/24
Response date: 21/06/24
It was **RESOLVED** to note.

PA24/03608
Mr Luis Escrig – **Storage Building Trematon Cornwall**
General purpose agricultural building.
Ward: Trematon
Date received: 22/05/24
Response date: 19/06/24
It was proposed by Councillor Brady, seconded by Councillor Stoyel and resolved to **RECOMMEND REFUSAL** on the basis of:

1. A lack of information;

2. There is currently an appeal in process on a similar application with regard to this site.

PA24/03713
Mr & Mrs Robinson – **4 Frith Road Saltash PL12 6EL**
Front and rear single storey extensions with internal alterations.
Ward: Tamar
Date received: 10/06/24
Response date: 01/07/24
It was proposed by Councillor Bullock, seconded by Councillor Peggs and resolved to **RECOMMEND APPROVAL.**

32/24/25 **TO RECEIVE A CONSULTATION FROM PEARCE FINE HOMES LIMITED RE THE STREET NAME CONCERNING A HOUSING DEVELOPMENT ON LAND SOUTH OF LUCES TENEMENT, TREMATON AND TO CONSIDER ANY ACTIONS AND ASSOCIATED EXPENDITURE.**

Members received and discussed the street name consultation received from Pearce Fine Homes Limited and contained within the circulated reports pack.

It was proposed by Councillor B Samuels, seconded by Councillor Peggs and **RESOLVED** to approve the street name Kelli Lowarth (Garden Grove) and to write to Pearce Fine Homes Limited informing them that members are extremely grateful to have been asked to consider their street name proposal.

33/24/25 **TO RECEIVE A FURTHER CONSULTATION FROM BLOOR HOMES ON TRELEDAN ROAD NAMES AND CONSIDER ANY ACTIONS AND ASSOCIATED EXPENDITURE.**

Members received and discussed the Treledan Saltash Street Names Consultation received from Bloor Homes and contained within the circulated reports pack.

It was **RESOLVED** to thank Bloor Homes for the consultation and note the proposed names. The discretion to add the road types within the development is left with Bloor Homes

34/24/25 **PUBLIC BODIES (ADMISSION TO MEETINGS) ACT 1960:**

To resolve that Pursuant to Section 1(2) of the Public Bodies (Admissions to Meetings) Act 1960 the public and press leave the meeting because of the confidential nature of the business to be transacted.

35/24/25 **TO CONSIDER ANY ITEMS REFERRED FROM THE MAIN PART OF THE AGENDA.**

None.

36/24/25 **PUBLIC BODIES (ADMISSION TO MEETINGS) ACT 1960:**

To resolve that the public and press be re-admitted to the meeting

37/24/25 **TO CONFIRM ANY PRESS AND SOCIAL MEDIA RELEASES ASSOCIATED WITH ANY AGREED ACTIONS AND EXPENDITURE OF THE MEETING.**

None.

DATE OF NEXT MEETING

Tuesday 16 July 2024 at 6.30 pm

Rising at: 6.51 pm

Signed: _____
Chairman

Dated: _____

CORNWALL COUNCIL
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Saltash Town Council
The Guildhall
12 Lower Fore Street
Saltash
Cornwall
PL12 6JX

393 C

Your ref:
My ref: S/636/108
Date: 24 June 2024

Dear Sirs,

Highways Act 1980 – Section 116
Stopping up of a section of the highway at Treledan, Saltash
Parish – Saltash
Grid reference – 241190:060385
Cornwall Council interactive mapping system - www.cornwall.gov.uk/community-and-living/mapping/

A request has been received by Cornwall Council for the stopping up and removal of highway rights over part of the highway at Treledan, Saltash which is highlighted blue on the enclosed plan.

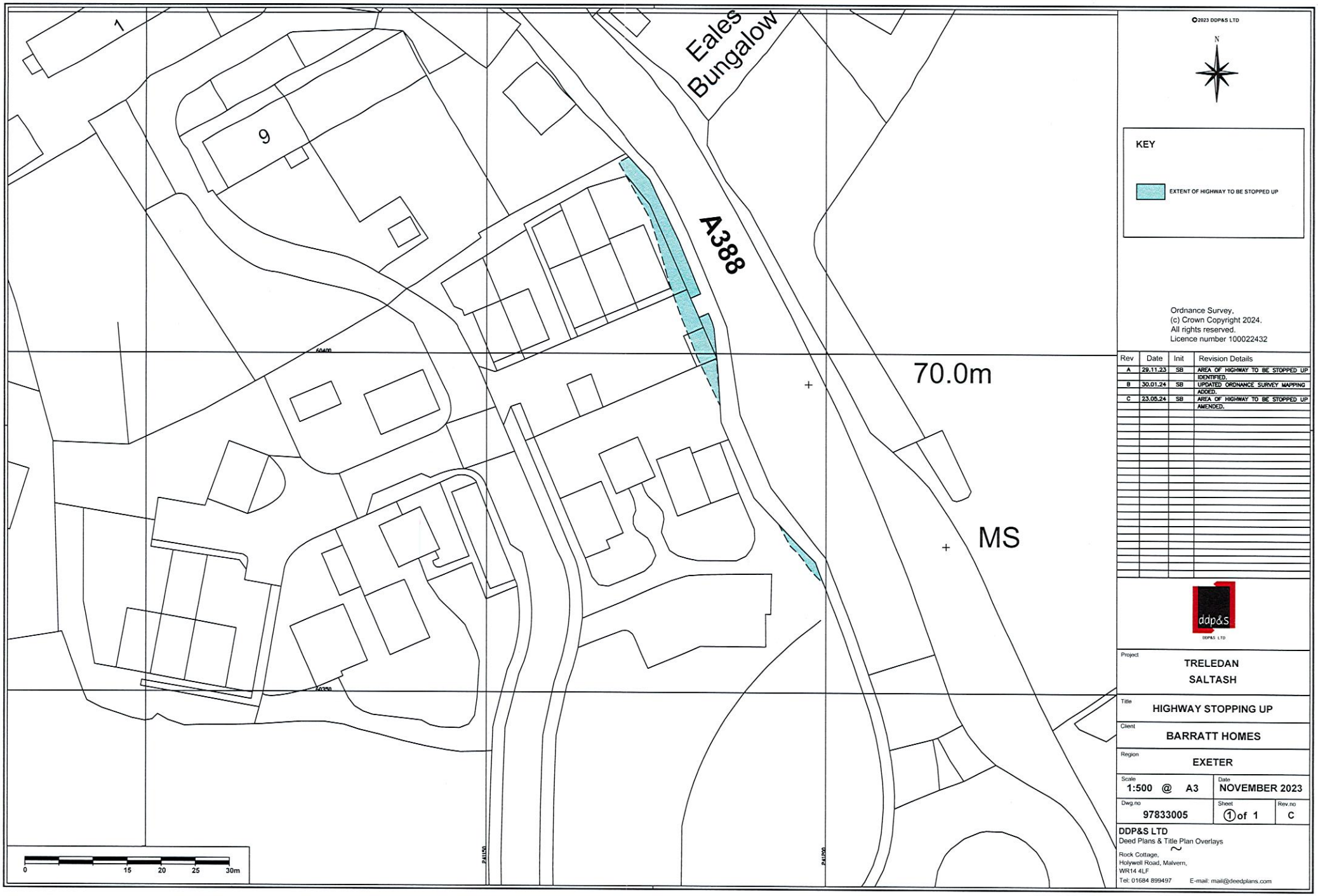
Please can you confirm in writing to the address below by 27th August 2024 of your support or objection to this stopping up application at Treledan, Saltash. If you object to this stopping up application please can you state the reasons for your objection.

Further details regarding stopping up's can be found on the Cornwall Council website - www.cornwall.gov.uk/stoppingup

Yours faithfully
Dhywgh hwi yn lel

Jenna Pegg
Professional Assistant
Environment & Connectivity Service
Tel: 01872 324247
Email: strategicdevelopment@cornwall.gov.uk

Freedom of Information Statement
With regard to Freedom of Information Act, this letter, together with any responses received by this Council, may be available for public inspection at some future date.
Although there are various exceptions within the legislation that might prevent disclosure of an enquiry, all of these have to be seen against the 'public interest' test. This means that in every case, an Authority may refuse to disclose information only if in all the circumstances of the case, the public interest in maintaining the exception outweighs the public interest in disclosing the information.



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KEY

EXTENT OF HIGHWAY TO BE STOPPED UP

Rev	Date	Init	Revision Details
A	29.11.23	SB	AREA OF HIGHWAY TO BE STOPPED UP IDENTIFIED.
B	30.01.24	SB	UPDATED ORDNANCE SURVEY MAPPING ADDED.
C	23.05.24	SB	AREA OF HIGHWAY TO BE STOPPED UP AMENDED.

ddp&s
DDP&S LTD

Project
TRELEDAN
SALTASH

Title
HIGHWAY STOPPING UP

Client
BARRATT HOMES

Region
EXETER

Scale
1:500 @ A3

Date
NOVEMBER 2023

Dwg.no
97833005

Sheet
1 of 1

Rev.no
C

DDP&S LTD
Deed Plans & Title Plan Overlays
Rock Cottage,
Holywell Road, Malvern,
WR14 4LF
Tel: 01684 899497 E-mail: mail@deedplans.com

Cornwall Council Website: Stopping up and diversion of highways

https://www.cornwall.gov.uk/transport-parking-and-streets/roads-highways-and-pavements/highway-and-infrastructure-adoptions/stopping-up-and-diversion-of-highways/

On occasion it may be possible to stop up or divert a public highway. This can happen when either:

- the road is no longer required as a public highway, or
- where there is a proposal for an alternative route

This removes the highway rights that exist on the land, and control of the land goes back to the owner.

The stopping up process may take between 12 and 24 months to complete

What is a highway?

A highway is an area over which the public have the right to pass or repass.

The term highway includes:

- roads
- carriageways
- footpaths
- footways
- bridleways
- cycle tracks
- and may include any verges or landscaped areas associated with them.

A highway may be:

- adopted and maintained at the public expense or
- unadopted and privately maintained.

We hold a list of publicly maintained highways. Please submit highway enquiry requests to Local Land Charges.

We do not currently hold a list of privately maintained highways.

Who owns the highway?

Often we do not own the land beneath the highway.

The land may form part of the adjacent lands title, be under third party ownership or there may be no owner.

If you are applying to stop up a highway, you are responsible for:

- checking who owns the land, and
- what rights you will have to pass over or use the land

You are also advised to take independent legal advice in this respect.

How do I apply for a highway to be stopped up?

Stopping up/diversion of the highway requires an order under either:

- the Highways Act 1980, or
- where the land is part of a planning application, the Town and Country Planning Act 1990

Highways Act 1980, Section 116

The Highway Authority can make an application to the magistrates court to stop up or divert a highway where:

- is unnecessary, or
- a proposed diversion makes the new route nearer or more commodious to the public

The application may be for

- the complete removal of highway rights, or
- the downgrading of a route to a footpath or bridleway

Only the relevant Highway Authority can make an application to the court.

Highways Act 1980, Section 117

The Highway Authority can make an application to the court on behalf of another person. The application will still need to meet the tests set out in section 116.

You must pay all reasonable costs incurred in making the application.

- Application Form - Stopping Up (pdf)
- Application Form - Stopping Up (Word)

Highways Act 1980, Section 118 and Section 119

Allows for the stopping up and diversion of footpaths and bridleways. This allows decisions by a Highway Authority rather than a magistrates court. They do not apply to roads.

Town and Country Planning Act 1990

To stop up/divert a highway for planning purposes the Secretary of State will make the decision. The stopping up/diversion will not apply until the order is in place. It is an offence under the act to stop up an area before the order is in place.

The Secretary of State does not have the power to stop up highways retrospectively. In these cases the application would be under the Highways Act 1980. The stopping up/diversion would then need to meet the tests under the Highways Act. If the application was unsuccessful the area would need to return to highway. This would be the responsibility of the applicant along with all costs.

Town and Country Planning Act, Section 247

Allows for the stopping up and/or diversion of any highway required

- to enable a development with a valid and relevant planning permission
- to provide new/improved highway which forms part of the planning permission.

Town and Country Planning Act, Section 248

Allows for the stopping up/diversion of highways where a planning permission is in place for

- the construction or improvement of a main highway, and
- it crosses or enters the existing highway.

Differences between the Town and Country Planning Act and the Highways Act

Applications must be through the most appropriate route. Whilst the process is similar there are distinct differences between the legislation. Depending on the route taken this may affect the outcome of the application.

Questions	Town and Country Planning Act 1990	Highways Act 1980
Who can apply for the order?	Anyone	Highway Authority
How much will the application cost?	DfT Website Currently no charge (Aug 2014)	CC cost schedule 2 stage Payment required
When can I apply for an order?	When a valid planning permission requires the highway to be stopped up/ diverted	Where the highway authority agree that the highway is • unnecessary or • the diversion is nearer or more commodious for the public
What role does the highway authority play?	The highway authority is a consultee to the Secretary of State	The Highway authority is the applicant to the court
Consultees?	Those affected by the order and/or who may have an interest in the proposed stopping up/diversion	Those affected by the order and/or who may have an interest in the proposed stopping up/diversion. The town or parish council
Who makes the order?	Secretary of State	Magistrates Court
What happens if any objections are not resolved?	Public inquiry held. The planning inspector makes the decision on whether to make the order	Unclassified road applications need the consent of the town/parish council. For other objections the highway authority will decide whether to proceed. Where an application proceeds to the court, the court will decide whether to make the order

The stopping up/diversion process

The Department for Transport deals with Town and Country Planning Act applications. Further information on the process is on the DfT Website.

Cornwall Council deals with Highways Act applications. We are the relevant Highway Authority for all roads in Cornwall.

Our Countryside Access team deal with stopping up/diversion of public footpaths, bridleways.

For all other highways please contact strategicdevelopment@cornwall.gov.uk.

Before we will consider the request you must submit an application.

- Application Form - Stopping Up (pdf)
- Application Form - Stopping Up (Word)

We will then determine whether the area meets the criteria set out in section 116.

If accepted, you must pay all costs in connection with the application. You must also meet all the costs of the highway alterations including the

- construction of any new roads and/or
- diversion of any highway apparatus and/or
- diversion of statutory undertakers' plant and/or
- the costs of any wayleaves/easements required as a consequence of the order

We will prepare the necessary plans and undertake an informal consultation.

Consultees in the process include

- Town/Parish council
- Statutory undertakers i.e. gas, water
- Owners and occupiers of all adjoining land affected by the proposed order
- Local county councillor
- Interest groups
- Other council departments

Stopping up of an unclassified road requires approval from the town/parish council. Where this consent is withheld the application will not proceed. It is advisable to contact the town/parish council before making an application.

For objections received by other consultees, we may

- negotiate with any objector to try and resolve any issues arising
- amend the area to be stopped up/diverted
- amend the application to reserve rights for pedestrians, horses or cycles
- reject the application.

Following the conclusion of the informal consultation we will update the applicant

If we decide to make an application to the court

- our legal team will serve notice of the intention to make an application to the court
- we will place site notices at either end of the affected highway and
- we will place an advert in the local and national newspapers

Please note we may receive further objections at this point. Any objectors can attend court.

The court will make a decision on whether to grant the order. If granted, the order applies on the day of the court hearing.

Implementation of orders

When an order is in place it may either allow for the stopping up/diversion to come into effect

- from the date stated in the order or,
- on completion of all improvement works (Town and Country Planning Act)

Any required improvement works must be undertaken at your cost.

You must

- submit plans for approval, and
- enter into any agreements/licences to work on the highway.

The land will remain highway until the completion, and approval, of all works. Until this time you must not interfere with, or close off, the area.

From: Julie Flower
Sent: Monday, July 1, 2024 12:21

Subject: Review of Gambling Policy

Information Classification: PUBLIC

Cornwall Council, as Licensing Authority, is responsible for licensing and regulation of local gambling. This includes dealing with a number of functions relating to gambling activities such as bingo, betting, adult gaming, family entertainment centres, gaming machines and lotteries.

The Council is required to publish a Statement of Principles under the Gambling Act (referred to as the gambling 'policy') and this policy must be reviewed every 3 years.

The policy is likely to be reviewed again in less than 3 years as a result of expected changes being introduced as part of the Government's review of the Gambling Act, which aims to ensure gambling regulation is fit for the digital age.

Therefore, the policy is simply being refreshed and renewed this year so that it remains lawful and enforceable.

The refreshed policy is attached for your information; there are only minor amendments to the policy, taking into account updated guidance and changes which officers consider are necessary. For ease of reference, the proposed changes in the attached policy are shown in *shaded italic text*.

If you wish to comment on the policy, please email licensing@cornwall.gov.uk by no later than **12 August 2024**.

Any comments will then be referred back to the Licensing Act Committee for consideration.

Kind regards

Julie Flower | Principal Licensing Practitioner (Policy)
Public Protection (Licensing), Cornwall Council, New County Hall, Truro TR1 3AY
www.cornwall.gov.uk | 'Onen hag oll' | www.businessregulatorysupport.co.uk

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CORNWALL COUNCIL

DRAFT REVISED

Statement of Principles

Gambling Act 2005

Date *##January 2025*

Public Protection

Current Document Status

Version	2.3	**Approving body**	Cornwall Council
Date	27 June 2024	Date of formal approval	*## January 2025*
Responsible officer	Julie Flower	**Review date**	January 2028
Location	https://www.cornwall.gov.uk/business-trading-and-licences/licences-and-street-trading/gambling-premises-licence/		

Version History

Date	Version	Author/Editor	Comments
July 2018	1.0	Sarah Kent	First draft for consultation
1 November 2018	2.0	Sarah Kent	Amended version following consultation responses
August 2022	2.1	Julie Flower	Revised draft for consideration by Licensing Act Committee prior to consultation
December 2022	2.2	Julie Flower	Amended draft recommended by Licensing Act Committee on 1 December to Full Council for adoption on 17 January 2023.
June 2024	*2.3*	*Julie Flower*	*Refresh for consideration by Licensing Act Committee prior to consultation*

Equality Impact Assessment Record

Date	Type of assessment conducted	Stage/level completed (where applicable)	Summary of actions taken decisions made	Completed by	Impact Assessment review date
16 October 2018	Initial	Complete	NFA	Sarah Kent / Angie McGinn	

Corporate Quality Assessment Record

Date	
Completed by	

Document retention

Document retention period	**E.g.** 5 years in hard and electronic copies.

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Appendices

1. Introduction

1.1. Cornwall is the most south-westerly part of the country and covers an area of 1,376 square miles. It has a population of just over 570,000.

1.2. Cornwall Council serves one of the largest and most geographically diverse council areas in the country, covering coastal, rural and urban spaces. A map of Cornwall is attached at **Appendix B** for information.

1.3. Cornwall's image has evolved from a rich history and culture of mining and maritime industries, the legacies of which can still be seen across the area. Today the economy depends heavily on its agricultural and tourist industry. Tourism makes up around a quarter of the Cornish economy.

1.4. Cornwall Council is designated under the Gambling Act 2005 as **'the Licensing Authority'** for Cornwall and has a number of important regulatory functions in relation to gambling. These include licensing premises, regulating gaming and gaming machines in clubs, granting permits to family entertainment centres for the use of certain lower stake gaming machines, regulating gaming and gaming machines on alcohol licensed premises, granting permits for prize gaming, registering small society lotteries, and tracks.

1.5. The Council is required by the Act to publish a statement of principles that it proposes to apply when exercising its functions under the Act. This statement must be reviewed at least every three years. The statement must also be reviewed from "time to time" and any amended parts re-consulted upon. The statement must be re-published after each review.

1.6. The Council has, in accordance with the Act and the Gambling Commission's Guidance for local authorities, prepared, published and reviewed this 'Statement of Principles' (Gambling Policy) that sets out the policies that it will generally apply having regard to the 'licensing objectives' as laid down in the Act.

1.7. The Act requires that the following people and bodies be consulted in the preparation or revision of the statement: -

- The Chief Officer of Police;
- One or more persons who appear to the Authority to represent the interests of persons carrying on gambling businesses in the Authority's area;
- One or more persons who appear to the Authority to represent the interests of persons who are likely to be affected by the exercise of the Authority's functions under the Act.

1.8. The Council consulted widely upon this statement. A list of those consulted is included as **Appendix C**.

1.9. This 'Statement of Principles' (Gambling Policy) is published on the Cornwall Council website at www.cornwall.gov.uk. Copies are also available to view at any of the main council offices by prior appointment.

2. Purpose and aim of the policy

2.1 The policy is intended to set out clear and concise guidance, procedure and principles for the benefit of the Licensing Authority, the community, applicants and other relevant organisations.

2.2 This policy statement does not override the right of any person to make an application, make representations about an application, or apply for a review of a licence, as each will be considered on its own merits and according to the statutory requirements of the Act.

In producing the final statement, the Licensing Authority had regard to the licensing objectives of the Act, the guidance and codes of practice issued by the Gambling Commission and any responses from those consulted on the statement. The full list of comments made and the consideration of responses given will be made available by contacting Cornwall Council.

3. Scope

The Licensing Objectives

3.1 In exercising most of its functions under the Act, the Licensing Authority shall have regard to the licensing objectives set out in section 1 of the Act. In particular, the Licensing Authority shall have regard to the licensing objectives when exercising its functions in relation to premises licences, temporary use notices and some permits. The licensing objectives are: -

- **preventing gambling from being a source of crime or disorder, being associated with crime or disorder or being used to support crime;**
- **ensuring that gambling is conducted in a fair and open way; and**
- **protecting children and other vulnerable persons from being harmed or exploited by gambling.**

The Council's approach is to work with and support local businesses whilst balancing risks and concerns in relation to the potential risks to the licensing objectives.

Public Health and Gambling

3.2 The Licensing Authority agrees with the Gambling Commission's view that gambling-related harm should be considered as a public health issue.

Gambling is a legitimate leisure activity enjoyed by many and the majority of those who gamble appear to do so with enjoyment, and without exhibiting any signs of problematic behaviour. There are however some people who do experience harm as result of their gambling.

Gambling related harm is defined as any type of repetitive gambling that disrupts or damages a person, family, or recreational pursuits. It can impact on an individual's physical and mental health, relationships, housing and finances and affect a wide range of people, such as families, colleagues and wider local communities (for example, where problem gambling is associated with crime or homelessness) and society as a whole (in terms of costs that may be created by problem gambling).

Evidence suggests that certain groups are more vulnerable to problem gambling including children and young people, people with mental health issues, certain minority ethnic groups, the unemployed, homeless people, those with low intellectual functioning, people with financially constrained circumstances and those living in deprived areas. Harms may include financial hardship, relationship breakdown, domestic violence, mental health problems and suicidal thoughts.

Unfortunately there are links with problem gambling and mental health issues and suicide and the Licensing Authority seeks to help people struggling with mental ill health through its Orange Button Community Scheme and safety planning.

The Licensing Authority also recommends 'GamCare' as the leading provider of support for anyone affected by problem gambling: www.gamcare.org.uk

Gambling Operators must comply with the Gambling Commission's Licence Conditions and Codes of Practice which includes Social Responsibility Codes which requires operators to have and put into effect policies and procedures to promote socially responsible gambling, which should reduce the risk of, and seek to identify problem gambling.

The Licensing Authority considers that Public Health teams, whilst not a responsible authority under the Act, can still assist the Licensing Authority to address gambling-related harm in its area. The Licensing Authority will work with the public health team to support people's

health, including those who are gambling and others who may be affected when gambling becomes problematic. The Council's 'Wellbeing guidance for people worried about gambling" contains some useful information in this regard:- https://www.cornwall.gov.uk/media/rvrfi10b/wellbeing-guidance-for-people-worried-about-gambling_final.pdf

The Licensing Authority acknowledges the Gambling Commission's National Strategy to Reduce Gambling Harms and will continue engaging with public health and other partners to reduce gambling harms.

Decision Making

3.3 The Licensing Authority is aware that, under section 153 of the Act, when making decisions about premises licences and temporary use notices it must aim to permit the use of premises for gambling in so far as it thinks it is:-

a. in accordance with any relevant code of practice issued by the Gambling Commission, these codes can be found at: https://www.gamblingcommission.gov.uk/for-gambling-businesses/Compliance/LCCP/Licence-conditions-and-codes-of-practice.aspx;
b. in accordance with any relevant guidance issued by the Gambling Commission;
c. reasonably consistent with the licensing objectives (subject to a and b); and
d. in accordance with the Authority's statement of principles.

Responsible Authorities

3.4 Responsible authorities are public bodies that must be notified of applications and that are entitled to make representations to the Licensing Authority in relation to applications for, and in relation to, premises licences. Section 157 of the Act identifies the bodies that are to be treated as responsible authorities.

3.5 Contact details of all responsible authorities under the Act have been attached at **Appendix D.** These contact details are available on the Cornwall Council website together with information on how to make applications for licences and other permissions.

3.6 The Licensing Authority is required by regulations to state the principles which it will apply in exercising its powers under Section 157(h) of the Act to designate a body which is competent to advise the Authority about the protection of children from harm. The principles are:-

- *the need for the body to be responsible for an area covering the whole of the Licensing Authority's area; and*
- *the need for the body to be answerable to democratically elected persons, rather than any particular vested interest group.*

3.7 In accordance with the Gambling Commission's Guidance for local authorities, the Licensing Authority designates the Safeguarding Children Partnership for this purpose. The Licensing Authority may at any time, if necessary, designate another body for this purpose and as such will do so and amend this policy accordingly without further consultation.

3.8 The Licensing Authority acknowledges that the Secretary of State may prescribe other responsible authorities by means of regulations.

Interested parties

3.9 Interested parties may make representations about premises licence applications, or apply for a review of an existing premises licence. These parties are defined in the Act as follows:-

"For the purpose of this part a person is an interested party in relation to an application for or in respect of a premises licence if, in the opinion of the Licensing Authority which issues the licence or to which the application is made, the person: -

a) lives sufficiently close to the premises to be likely to be affected by the authorised activities,
b) has business interests that might be affected by the authorised activities, or
c) represents persons who satisfy paragraph (a) or (b)".

3.10 These factors, along with any other relevant considerations together with the principles indicated below, will be taken into account by the Licensing Authority in determining whether a person can be regarded as an interested party. Other relevant considerations may include for example, the size of the premises and the nature of the activities taking place but of course these examples are illustrative and not exhaustive.

3.11 The principles which the Licensing Authority will apply, in accordance with regulations, in exercising its powers under the Act to determine whether a person is an interested party are: -

a) Each case will be decided upon its own merits. The Licensing Authority will not apply an inflexible approach to its decision-making and will have regard to Gambling Commission's guidance in relation to matters to be considered. It will also consider that "has business interests" should be given the widest possible interpretation and include partnerships, charities, faith groups and medical practices.

b) The Licensing Authority will view trade associations, trade unions and residents' and tenants' associations as interested parties provided they have member(s) who can be classed as an interested party(ies) under the terms of the Act, i.e. lives sufficiently close to the premises or has business interests likely to be affected by the authorised activities; or is acting as a representative on behalf of an individual / business likely to be affected. A letter from the interested party requesting the representation will be required.

c) Interested parties can be persons who are democratically elected such as councillors and MPs. The Licensing Authority will normally expect written evidence that a person/body (e.g. an advocate / relative) 'represents' someone who either lives sufficiently close to the premises likely to be affected by the authorised activities and/or has business interests that might be affected by the authorised activities. A letter from the interested party requesting the representation will usually be sufficient.

3.12 If individuals wish to approach a Councillor of the Licensing Authority to ask them to represent their views, then those councillors will not be part of the Licensing Committee convened to determine the licence application. If there are any doubts or concerns, the Licensing Officer should be contacted for further advice.

3.13 Representations in respect of applications for new premises or applications for reviews should be based on the licensing objectives of the Act, relevant guidance and codes of practice.

Licensing Authority Functions

3.14 Licensing Authorities are required under the Act to:

- Be responsible for the licensing of premises where gambling activities are to take place by issuing *Premises Licences;*
- Issue *Provisional Statements;*
- Regulate *members' clubs* and *miners' welfare institutes* who wish to undertake certain gaming activities via issuing *Club Gaming Permits* and/or *Club Machine Permits;*
- Issue *Club Machine Permits* to *Commercial Clubs;*
- Grant permits for the use of certain lower stake gaming machines at *unlicensed Family Entertainment Centres;*
- Receive notifications from premises licensed under the Licensing Act 2003 for the sale of alcohol for unconditional consumption on the premises for the use of one or two gaming machines (Category C or D);
- Issue *Licensed Premises Gaming Machine Permits* for premises licensed to sell/supply alcohol for consumption on the licensed premises, under the Licensing Act 2003, where there are more than two machines;
- *Register small society lotteries* below prescribed thresholds;

- Issue *Prize Gaming Permits*;
- Receive and Endorse *Temporary Use Notices*;
- Receive *Occasional Use Notices*;
- Provide information to the Gambling Commission regarding details of applications received and licences issued or refused (see section above on 'information exchange); and
- Maintain registers of the permits and licences issued or refused under these functions.

3.15 Licensable activities are described in the Glossary in **Appendix A**.

The Gambling Commission

3.16 The Gambling Commission regulates remote gambling and issues Personal and Operator licences for premises. The "National Lottery" is also regulated by the Gambling Commission.

The Gambling Commission regulates gambling in the public interest. It does so by keeping crime out of gambling; by ensuring that gambling is conducted fairly and openly; and by protecting children and vulnerable people.

The Commission provides independent advice to the Government about the manner in which gambling is carried out, the effects of gambling, and the regulation of gambling generally. It also produces guidance under Section 25 of the Act detailing how local authorities should exercise their licensing functions.

In addition, the Commission's role is to issue codes of practice under Section 24 of the Act about the manner in which facilities for gambling are provided, and how those provisions might be advertised.

Information about the Gambling Commission can be found at www.gamblingcommission.gov.uk

4. Policy statement

PREMISES LICENCES

4.1 Premises licences will be subject to the requirements set out in the Act and its regulations, as well as specific mandatory and default conditions which are detailed in regulations issued by the Secretary of State. The Licensing Authority will be able to exclude default conditions and also attach others, where it is believed to be reasonable and proportionate. The mandatory and default conditions can be found at http://www.legislation.gov.uk/uksi/2007/1409/contents/made.

An application for a premises licence may only be made by persons (which includes companies or partnerships):

- who are aged 18 or over and
- who have the right to occupy the premises and
- who have an operating licence which allows them to carry out the proposed activity. Details of operators that hold an operating licence are available on the Gambling Commission's website or
- who have applied for an operating licence to allow them to carry out the proposed activity. A premises licence cannot be determined until an operating licence has been issued by the Gambling Commission.

4.2 The Licensing Authority, in making decisions about premises licences, will aim to permit the use of premises for gambling in so far as it thinks it is:-

- in accordance with any relevant code of practice issued by the Gambling Commission;
- in accordance with any relevant guidance issued by the Gambling Commission;
- reasonably consistent with the licensing objectives; and
- in accordance with the Authority's statement of principles.

4.3 The Licensing Authority notes the Gambling Commission's Guidance for local authorities that "Licensing authorities should be aware that other considerations such as moral or ethical objections to gambling are not a valid reason to reject applications for premises licences. This is because such objections do not relate to the licensing objectives. An authority's decision cannot be based on dislike of gambling, or a general notion that it is undesirable to allow gambling premises in an area (with the exception of the casino resolution powers)".

4.4 Previous legislation required that the grant of certain gambling permissions should take account of whether there is unfulfilled demand for the facilities. The Gambling Commission has stated that "absence of unmet demand is not a criterion for a licensing authority in considering an application for a premises licence under the Gambling Act. Each application must be considered on its merits without regard to demand.

Gambling Activity

4.5 By distinguishing between premises types the Act makes it clear that the gambling activity of a premises should include that described by the premises licence.

The Licensing Authority will have regard to the relevant Statutory Guidance issued by the Gambling Commission for each specific type of gambling premises.

Definition of "premises"

4.6 A premises is defined in the Act as "any place". Different premises licences cannot apply in respect of single premises at different times. However, it is possible for a single building to be subject to more than one premises licence, provided they are for different parts of the building and the different parts of the building can be reasonably regarded as being different premises. This approach has been taken to allow large, multiple unit premises such as pleasure parks, tracks and shopping malls to obtain discrete premises licence where appropriate safeguards are in place. Whether different parts of a building can properly be regarded as being separate premises will depend on the circumstance. However, the Gambling Commission considers that areas of a building that are artificially or temporarily separated for example by way of ropes or moveable partitions cannot be properly regarded as different premises.

Division of premises and access between premises

4.7. There can be no access from one licensed gambling premises to another, except between premises which allow access to those under the age of 18 and with the further exception that licensed betting premises may be accessed from other licensed betting premises. Under-18s can go into family entertainment centres, tracks, pubs and some bingo clubs. So access is allowed between these types of premises.

4.8 Where a premises are part of the same building / within the same building there should be an area separating the areas concerned which the public visit for the purposes other than Gambling. This will ensure no direct access.

4.9 There is no definition of "direct access" in the Act or regulations. However, the Statutory Guidance states, it could be said that there should be an area separating the premises concerned (for example a street or café), which the public go to for purposes other than gambling, for there to be shown to be no direct access.

4.10 The relevant access provisions for each premises type is as follows:

Casinos

- the principal entrance to the premises must be from a street (please refer to the definition in Appendix A for "street")
- no entrance to a casino must be from premises that are used wholly or mainly by children and/or young persons
- no customer must be able to enter a casino directly from any other premises which holds a gambling premises licence.

Adult gaming centres

- no customer must be able to access the premises directly from any other licensed gambling premises or premises with a Permit under the Gambling Act.

Betting shops

- access must be from a street (please refer to the definition in Appendix A for "street") or from other premises with a betting premises licence, no direct access from a betting shop to another premises used for the retail sale of merchandise or services. In effect there cannot be an entrance to a betting shop from a shop of any kind and you could not have a betting shop at the back of a cafe – the whole area would have to be licensed.

Tracks

- no customer should be able to access the premises directly from:
- a casino
- an adult gaming centre.

Bingo premises

- no customer must be able to access the premises directly from:
- a casino
- an adult gaming centre
- a betting premises, other than a track.

Family entertainment centres

- no customer must be able to access the premises directly from:
- a casino
- an adult gaming centre
- a betting premises, other than a track.

4.11 The Licensing Authority takes particular note of the Gambling Commission's Guidance for local authorities which states that licensing authorities should:-

- take particular care in considering applications for multiple premises licences for a building and those relating to a discrete part of a building used for other (non-gambling) purposes. Entrances and exits from parts of a building covered by one or more licences should be separate and identifiable so that the separation of different premises is not compromised and that people do not 'drift' into a gambling area.

4.12 When determining an application the Licensing Authority, in order to satisfy themselves that there is separation between premises and that the access between premises is acceptable, will have regard to

the plan submitted with the application, the ability for the premises to comply with the mandatory conditions, the Act, Gambling Commission guidance and codes of practice.

The Licensing Authority will raise a representation against an application and may request a review of a premises licence should they feel that the separation and access to the premises could or is undermining one or more of the licensing objectives.

4.13 It is noted that some operators may submit an application for the grant of a premises licence rather than applying for a provisional statement. This means that the premises are likely to be under construction and therefore not ready for use. In these circumstances the Licensing Authority will have due regard to the relevant sections of the statutory guidance issued by the Gambling Commission when determining the application.

Location

4.14 The Licensing Authority will not consider 'demand' issues with regard to the location of premises. The Licensing Authority will however, consider the licensing objectives and associated relevant considerations and will pay particular attention to the protection of children and vulnerable persons from being harmed or exploited by gambling, as well as issues of crime and disorder. Associated relevant considerations could include such factors as the proximity of gambling premises to schools and vulnerable adult centres or to residential estates with a high number of children but will be a matter of determination in each case.

Duplication with other regulatory regimes

4.15 The Licensing Authority will seek to avoid any duplication with other statutory / regulatory systems where possible, including planning. The Licensing Authority will not normally consider whether a licence application is likely to be awarded planning permission or building regulations approval. It will however, listen to, and consider carefully and appropriately, any concerns about conditions which are not able to be met by the licensee due to planning restrictions, should such a situation arise.

Licensing objectives

4.16 Any premises licences granted shall be reasonably consistent with the licensing objectives, subject to any relevant code of practice or guidance issued by the Gambling Commission.

4.17 **Licensing Objective: 'Preventing gambling from being a source of crime or disorder, being associated with crime or disorder or being used to support crime'**

The Licensing Authority acknowledges that the Gambling Commission will be taking a leading role in preventing gambling from being a source of crime. It also acknowledges the Gambling Commission's guidance which states, *"Licensing Authorities will need to consider the location of premises in the context of this licensing objective. If an application for a licence or permit is received in relation to premises that are in an area noted for particular problems with organised crime, for example, licensing authorities should think about what (if any) controls might be appropriate to prevent those premises becoming a source of crime. These might include conditions being put on the licence, such as a requirement for door supervisors"*. The Licensing Authority notes the Gambling Commission's guidance in relation to disorder and nuisance and that in the case of gambling premises licences, disorder is intended to mean activity that is more serious and disruptive than mere nuisance. When determining whether a disturbance is serious enough to constitute disorder, the Licensing Authority will consider factors such as whether police assistance was required and how threatening the behaviour was to those who could see it or hear it.

4.18 **Licensing Objective: 'Ensuring that gambling is conducted in a fair and open way'**

The Licensing Authority will not normally (except with regard to tracks i.e. where there is no operating licence) become concerned with ensuring that gambling is conducted in a fair and open way as this will be addressed via operating and personal licences issued by the Gambling Commission.

4.19 **Licensing Objective: 'Protecting children and other vulnerable persons from being harmed or exploited by gambling'**

The Licensing Authority acknowledges the Gambling Commission's guidance that this objective means preventing children from taking part in gambling (as well as restriction of advertising so that gambling products are not aimed at or are particularly attractive to children). The Licensing Authority will therefore consider whether specific measures are required at particular premises, with regard to this licensing objective. Appropriate measures may include supervision of entrances/machines, segregation of areas etc.

4.20 The Licensing Authority will take into account any Codes of Practice issued by the Gambling Commission regarding the licensing objectives particularly in relation to specific premises.

4.21 As regards the term "*vulnerable persons*" the Gambling Commission does not offer a definition but states that "*it will for regulatory purposes assume that this group includes people who gamble more than they want to; people who gamble beyond their means; and people who may not be able to make informed or balanced decisions about gambling due to mental health needs, learning disability or substance misuse relating to alcohol or drugs."* The Licensing

Authority will consider this licensing objective on a case-by-case basis. Should a more exhaustive practical definition emerge in future then this policy statement will be reviewed in the light of that definition. The Licensing Authority would recommend that Operators have a specific training programme in place to ensure that staff are able to identify children and other vulnerable persons.

Local Area Profile

4.22 At the time of writing this statement of principles and following consultation with Responsible Authorities and other parties there does not appear to be any significant concerns relating to gambling premises generally within Cornwall.

Having said that, the Council appreciates that there is a high density of Gambling premises within tourist areas within Cornwall and the influx of tourists to Cornwall during the summer months increases the use of the premises.

In addition, unlike other regulated areas, such as alcohol, gambling is much less visible as a concern for residents. The problem gambler or the under 18 who gambles is not likely to contact the licensing authority to complain and therefore proactive inspection and enforcement is necessary to ensure the necessary protections, especially for the young and vulnerable, are in place and working effectively.

Conditions

4.23 Mandatory and default conditions are often sufficient to ensure an application is reasonably consistent with the Licensing Objectives. Any conditions attached to premises licences by the Licensing Authority, will be proportionate to the circumstances which are sought to be addressed. Conditions shall be:-

- relevant to the need to make the proposed premises suitable as a gambling facility;
- directly related to the premises and the type of licence applied for;
- fairly and reasonably related to the scale and type of premises; and
- reasonable in all other respects.

Additional conditions will only be imposed where there is evidence of a risk to the licensing objectives in the circumstances of a particular case and that risk is not adequately addressed within the applicant's risk assessment.

4.24 Certain matters are set out in the Act and may not be the subject of conditions. These are:

- conditions which make it impossible to comply with an operating licence;

- conditions as to gaming machines that contradict the provisions in the Act;
- conditions making activities, premises or parts of them operate as a membership club; and
- conditions on fees, winnings, stakes or prizes.

4.25 Decisions upon individual conditions will be made on a case-by-case basis, although there will be a number of measures that the Licensing Authority will consider utilising should there be a perceived need, such as the use of supervisors, appropriate signage for adult only areas etc. There are specific comments made in this regard under some of the licence types in this policy. Applicants may offer their own suggestions as to the way in which the licensing objectives can be met effectively.

4.26 The Licensing Authority, in accordance with the Gambling Commission's guidance, will consider specific measures which may be required for buildings which are subject to multiple premises licences. Such measures may include the supervision of entrances; segregation of gambling from non-gambling areas frequented by children; and the supervision of gaming machines in non-adult gambling specific premises in order to pursue the licensing objectives.

4.27 The Licensing Authority expects that where category C (see **Appendix E**) or above machines are on offer in premises to which children are admitted that (including buildings where multiple premises licences are applicable):-

- all such machines are located in an area of the premises which is separated from the remainder of the premises by a physical barrier which is effective to prevent access other than through a designated entrance;
- only adults are admitted to the area where these machines are located;
- access to the area where the machines are located is supervised;
- the area where these machines are located is arranged so that it can be observed by the staff or the licence holder; and
- at the entrance to and inside any such areas there are prominently displayed notices indicating that access to the area is prohibited to persons under 18.

Door Supervisors

4.28 The Licensing Authority, in accordance with the Gambling Commission's guidance, will consider whether there is a need for door supervisors in terms of the licensing objectives; the protection of children and vulnerable persons from being harmed or exploited by gambling; and preventing premises becoming a source of crime.

4.29 The Licensing Authority acknowledges that in the case of casinos or

bingo premises (but not betting shops), any contract staff employed as door supervisors (carrying-out functions set-out in Schedule 2 Part 1 of the Private Security Industry Act 2001), must be licensed by the Security Industry Authority (SIA). In-house staff carrying-out the aforementioned functions in casinos and bingo premises, are exempt from this requirement under the 2001 Act and therefore are not required to be licensed by the SIA.

4.30 For casinos or bingo premises where in-house staff employed as door supervisors may come into contact with children or vulnerable persons, the Licensing Authority expects them to be subject to a Police National Database (PND) check or a Disclosure and Barring Service disclosure certificate upon employment and every 3 years thereafter and / or registration with the Independent Safeguarding Authority , as appropriate.

This is to ensure that they are fit and proper persons to work in such a capacity. Staff employed as door supervisors should have undertaken appropriate training such as BIIAB National Certificate for Door Supervisors. This is in recognition of the nature of the work in terms of searching individuals and dealing with potentially aggressive persons.

4.31 For premises other than casinos and bingo premises, the operator and the Licensing Authority may decide that supervision of entrances / machines is appropriate but it will need to be decided whether these door supervisors need to be SIA licensed or not. It will not be automatically assumed that they need to be.

Adult Gaming Centres

4.32 The Licensing Authority will specifically have regard to the need to protect children and vulnerable persons from harm or being exploited by gambling and will expect the applicant to satisfy the authority that there will be sufficient measures to, for example, ensure that under 18 year olds do not have access to the premises.

4.33 The Licensing Authority may consider measures to meet the licensing objectives such as:-

- Proof of age schemes
- CCTV
- Supervision of entrances / machine areas
- Physical separation of areas
- Location of entry
- Notices / signage
- Self-exclusion schemes in accordance with the Social Responsibility Code
- Provision of information leaflets / helpline numbers for organisations such as GamCare. For more information go to www.GamCare.org.uk

The above list is neither mandatory, nor exhaustive and is merely indicative of example measures.

(Licensed Family) Entertainment Centres (LFECs):

4.34 The Licensing Authority will specifically have regard to the need to protect children and vulnerable persons from harm or being exploited by gambling and will expect applicants to satisfy the authority, for example, that there will be sufficient measures to ensure that under 18 year olds do not have access to 'adult only' gaming machine areas.

4.35 The Licensing Authority may consider measures to meet the licensing objectives such as:-

- CCTV
- Supervision of entrances / machine areas
- Physical separation of areas
- Location of entry
- Notices / signage
- Self-exclusion schemes
- Provision of information leaflets / helpline numbers for organisations such as GamCare.
- Measures / training for staff on how to deal with suspected truant school children on the premises

The above list is neither mandatory, nor exhaustive and is merely indicative of example measures.

4.36 The Licensing Authority will have regard to any guidance issued by the Gambling Commission, in relation to any conditions that apply to operating licences covering the way in which the area containing the category C machines should be delineated. The Licensing Authority will also have regard to any mandatory or default conditions issued by the Secretary of State applicable to this type of premises licence.

Casinos

4.37 **No casinos resolution'** – the Licensing Authority has not passed a 'no casino' resolution under Section 166 of the Gambling Act 2005, but is aware that it has the power to do so. Should the Licensing Authority decide in the future to pass such a resolution, it will update this policy statement with details of that resolution. The decision to pass such a resolution may only be taken by the authority as a whole and cannot be delegated to the Licensing Committee.

4.38 **Casinos and competitive bidding –** where a Licensing Authority area is enabled to grant a premises licence for a new style casino (the Secretary of State has made such regulations under Section 175 of the Act) there are likely to be a number of operators who will want to run the casino. In such situations the Licensing Authority will run a 'competition' under Schedule 9 of the Act and in line with any

regulations / codes of practice issued under the Act.

4.39 **Licence considerations / conditions** – The Licensing Authority will have regard to any guidance issued by the Gambling Commission in relation to casinos.

Bingo

4.40 The Licensing Authority expects that, where children are allowed to enter premises licensed for bingo, they do not participate in gambling other than on category D machines.
Where category C or above machines are available in premises to which children are admitted the Licensing Authority expects that: -

- all such machines will be located in an area of the premises separated from the remainder of the premises by a physical barrier which is effective to prevent access other than through a designated entrance;
- only adults will be admitted to the area where the machines are located;
- access to the area where the machines are located is supervised;
- the area where the machines are located is arranged so that it can be observed by staff of the operator or the licence holder; and
- at the entrance to, and inside any such area there are prominently displayed notices indicating that access to the area is prohibited to persons under 18.

4.41 The Licensing Authority will have regard to any guidance issued by the Gambling Commission, in relation to the suitability and layout of bingo premises.

Betting Machines

4.42 Betting machines – the Licensing Authority will, in accordance with the Gambling Commission's guidance, take into account the size of the premises, the number of counter positions available for person-to-person transactions and the ability of staff to prevent the use of the machines by children and young persons (it is an offence for those under 18 to bet) or by vulnerable people, when considering the number/nature/circumstances of betting machines an operator wants to offer.

Betting Premises

4.43 The licence conditions and codes of practice relevant to betting premises requires that gaming machines may be made available for use in licensed betting premises only where there are also substantive facilities for non-remote betting available in the premises.

Tracks "including other sporting venues"

4.44 Tracks under the Act include premises where a race or other sporting event takes place or is intended to take place. Tracks may be subject to more than one premises licence provided each licence relates to a specified area of the track. The Licensing Authority will consider the impact upon the third licensing objective (i.e. the protection of children and vulnerable persons from being harmed or exploited by gambling) and expects that entrances to each type of premises are distinct and that children are excluded from gambling areas where they are not permitted to enter.

4.45 The Licensing Authority expects premises licence applicants to demonstrate suitable measures to ensure that children do not have access to adult only gaming facilities, for example, where children and young persons are permitted to enter track areas where facilities for betting are provided on days when dog-racing and/or horse racing takes place, they must be prevented from entering areas where gaming machines (other than category D machines) are provided.

4.46 The Licensing Authority may consider measures to meet the licensing objectives such as:-

- Proof of age schemes
- CCTV
- Supervision of entrances / machine areas
- Physical separation of areas
- Location of entry
- Notices / signage
- Self-exclusion schemes
- Provision of information leaflets / helpline numbers for organisations such as GamCare

The above list is neither mandatory nor exhaustive, and is merely indicative of example measures.

Gaming Machines

4.47 The Licensing Authority will consider the location of gaming machines at tracks and expects applicants for track premises licences to demonstrate, (where the applicant holds a pool betting operating licence and is going to use his entitlement to four gaming machines), that these machines are located in areas from which children are excluded. Children and young persons, however, will not be prohibited from playing category D gaming machines on a track. The Licensing Authority will have regard to any further guidance issued by the Gambling Commission.

Condition on rules being displayed

4.48 The Licensing Authority, in accordance with the Gambling

Commission's guidance, will attach a condition to track premises licences requiring the track operator to ensure that the rules are prominently displayed in or near the betting areas, or that other measures are taken to ensure that they are made available to the public. For example, the rules are to be printed in the race card, or made available in leaflet form from the track office.

Applications and Plans

4.49 The Licensing Authority expects applicants to submit a detailed plan(s) (as part of the whole application) of the racetrack itself and the area that will be used for temporary "on-course" betting facilities (often known as the "betting ring") and in the case of dog tracks and horse racecourses fixed and mobile pool betting facilities operated by the Tote or track operator, as well as any other proposed gambling facilities. The plan(s) should make clear what is being sought for authorisation under the track betting premises licence and what, if any, other areas are to be subject to a separate application for a different type of premises licence.

Off Course Betting Premises on 'Tracks'

4.50 The Licensing Authority, in accordance with the Gambling Commission's guidance, considers that it is generally preferable for all self-contained premises operated by off-course betting operators on track to be the subject of separate premises licences, to ensure that there is clarity between the respective responsibilities of the track operator and the off-course betting operator running a self-contained unit on the premises.

Travelling Fairs

4.51 The Licensing Authority will decide whether the statutory requirement for facilities for gambling amount to no more than an ancillary amusement at the fair is met where category D machines and/ or equal chance prize gaming (see **Appendix E**) without a permit are to be made available for use at travelling fairs.

4.52 The Licensing Authority will consider whether the applicant falls within the statutory definition of a travelling fair (refer to **Appendix A** for definition).

4.53 The 27-day statutory maximum for land being used as a fair is per calendar year, and applies to the piece of land on which fairs are held, regardless of whether it is the same or different travelling fairs occupying the land. The Licensing Authority will work with neighbouring authorities to ensure that land which crosses authority boundaries is monitored so that the statutory limits are not exceeded.

Provisional Statements

4.54 Where a premises licence application follows the grant of a provisional statement, no further representations from relevant authorities or interested parties can be taken into account unless they concern matters which could not have been addressed at the provisional statement stage, or they reflect a change in the applicant's circumstances. In addition, the Licensing Authority may refuse the premises licence (or grant it on terms different to those attached to the provisional statement) only by reference to matters:-

(i) which could not have been raised by objectors at the provisional licence stage;
(ii) which in the authority's opinion reflect a change in the operator's circumstances;
(iii) where the premises has not been constructed in accordance with the plan and information submitted with the provisional statement application. This must be a substantial change to the plan and Licensing Authorities should discuss any concerns they have with the applicant before making a decision.

4.55 The Licensing Authority, in accordance with Gambling Commission's guidance, will not take into account irrelevant matters. An example of an irrelevant matter would be the likelihood of the applicant obtaining planning permission or building regulations approval for the proposal.

Variations

4.56 Should the authority receive an application to vary a premises licence for a bingo or betting premises in order to extend the opening hours, then in accordance with the Gambling Commission Guidance this authority will need to be satisfied that the reason for the application is in line with the requirements on the gambling activity (i.e. the need for operating licence holders to ensure that the gambling activity appropriate to the licence type is actually offered at those premises).

Reviews

4.57 Requests for a review of a premises licence can be made by interested parties or responsible authorities. The Licensing Authority will decide whether the review is to be carried out and will be determined on the basis of whether the request for the review is relevant to the matters listed below; the request is frivolous, vexatious; and whether it is substantially the same as previous representations or requests for review. These will certainly not cause this Licensing Authority to alter/revoke/suspend the licence.

Any requests for a review of a premises licence must be: -

- in accordance with any relevant code of practice issued by the Gambling Commission;
- in accordance with any relevant guidance issued by the Gambling Commission;
- reasonably consistent with the licensing objectives; and
- in accordance with the authority's statement of licensing policy.

4.58 The Licensing Authority may also initiate a review of a licence on the basis of any relevant reason that it thinks is appropriate.

4.59 Once a valid application for a review has been received, representations can be made by responsible authorities and interested parties during the statutory consultation period.

4.60 The purpose of the review will be to determine whether the Licensing Authority should take any action in relation to the licence. The options available are:

- Add, remove or amend a licence condition;
- Remove or amend a default condition, such as opening hours;
- Suspend the premises licence for a period not exceeding 3 months;
- Revoke the licence.

Premises based Risk Assessments

4.61 In accordance with the Social Responsibility code within the Gambling Commission's Licence Conditions and Codes of Practice, operators must assess the local risks to the licensing objectives posed by the provision of gambling facilities at their premises, and have policies, procedures and control measures in place to mitigate those risks.

All new and varied premises operators must also undertake a review of those assessments when certain triggers are met.

These triggers along with the Council's view on what would instigate either a new assessment or the review of an existing one are detailed within Guidance on undertaking risk assessments, this guidance includes a Specimen risk assessment for use should premises choose to use it.

4.62 Local risk factors are risks that affect one or more of the licensing objectives. Should risks be identified upon completion of a risk assessment the local authority will expect operators to implement any measures identified to mitigate any risks.

Conditions may be identified that are considered appropriate in addition to the mandatory and default conditions, however each case will be considered on its own merits and evidence must be produced

that supports additional conditions that premises are not already subject to.

The Licensing Authority expects a copy of the most recent local risk assessment to be kept on each premises that is subject to a premises licence under the Gambling Act 2005.

The risk assessment must be shared with the Licensing Authority when applying for a new or variation of premises licence or at the request of the Licensing Authority.

Permits / Temporary & Occasional Use Notice

Unlicensed Family Entertainment Centre (uFEC) gaming machine permits

4.63 Unlicensed Family Entertainment Centres will be able to offer only category D machines (refer to **Appendix E**) in reliance on a gaming machine permit. Any number of category D machines can be made available with such a permit.

4.64 If the operator of a family entertainment centre wishes to make category C machines available in addition to category D machines, the operator will need to apply for an operating licence from the Gambling Commission and a premises licence from the Licensing Authority. The Council recommends that operators consider observing the BACTA Voluntary Code of Practice which can be found at www.bacta.org.uk. These are BACTA's current codes on social responsibility for the gaming machine sector.

4.65 Permits cannot be issued in respect of Vessels or Vehicles.

4.66 Applicants when applying for a permit must show that the premises will be wholly or mainly used for making gaming machines available for use. The permit cannot therefore be granted for an entire shopping centre, airport or bowling alley, for example. Typically, the machines would be in a designated, enclosed area.

4.67 The application for a permit can only be made by a person who occupies or plans to occupy the premises to be used as an uFEC and, if the applicant is an individual, he or she must be aged 18 or over. Applications for a permit cannot be made if a premises licence under the Gambling Act 2005 is in effect for the same premises. The application must be made to the licensing authority in whose area the premises are wholly or partly situated.

4.68 The application must be submitted on the Licensing Authority's standard form and be accompanied by the prescribed application fee. The Licensing Authority also requires the application to be accompanied by a plan of the premises that will be used as an uFEC,

which shows the location of any gaming machines that will be provided if the permit were to be granted.

4.69 The Licensing Authority will expect applicants to show that there are policies and procedures in place to protect children and other vulnerable persons from being harmed or exploited by gambling. The efficiency of such policies and procedures will each be considered on their merit; however, they may include appropriate measures / training for staff as regards to suspected truant school children on the premises, measures / training covering how staff would deal with unsupervised very young children being on the premises, or children causing perceived problems on / around the premises, etc.

4.70 The Licensing Authority will expect applicants to demonstrate: -

- that the applicant has no relevant convictions (those that are set out in Schedule 7 of the Act). In order to satisfy that the applicant has no relevant convictions, a basic ~~Disclosure certificate issued by the Disclosure and Barring Service (DBS)~~ *DBS check is required to be submitted by the applicant which must be no more than 1 month old at the time of submitting the application* ~~before the application is made is required to be submitted by the applicant~~. If the applicant is a company, a basic ~~disclosure certificate~~ *DBS check* will be required to be submitted by each of the Directors of the company.
  The basic DBS check can be obtained either via GOV.UK; or through a Responsible Organisation - the DBS has a list of companies who are Responsible Organisations on the GOV.UK webpage.

- that staff are trained to have a full understanding of the maximum stakes and prizes

4.71 An application for a permit may be granted only if the Licensing Authority is satisfied that the premises will be used as an uFEC, and if the chief officer of police has been consulted on the application.

4.72 When considering an application, the Licensing Authority will consider the suitability of the applicant. Given that family entertainment centres are likely to appeal particularly to children and young persons, the Licensing Authority will give particular weight to matters relating to the protection of children from being harmed or exploited by gambling.

4.73 When considering applications for a permit, in accordance with the Act, the Licensing Authority will have regard to any relevant guidance issued by the Gambling Commission; however it need not (but may) have regard to the licensing objectives.

4.74 It should be noted that the Licensing Authority cannot attach conditions to this type of permit.

4.74 The Licensing Authority may not refuse an application unless it has notified the applicant of the intention to refuse and the reasons for it, and given them an opportunity to make representations orally or in writing or both.

4.75 The permit will have effect for ten years, unless it ceases to have effect because it is surrendered or lapses or is renewed. There is no annual fee for an uFEC gaming machine permit

The permit may lapse for a number of reasons, namely:

- if the holder ceases to occupy the premises
- if the Licensing Authority notifies the holder that the premises are not being used as an uFEC
- if an individual permit holder dies, becomes incapable by reason of mental or physical incapacity, becomes bankrupt, or sequestration of his estate is ordered
- if the company holding the permit ceases to exist or goes into liquidation.

Renewal of a Permit

4.76 An application for renewal of an uFEC gaming machine permit must be made during the period beginning six months before the permit expires and ending two months before it expires. The procedure for renewal is the same as for an application. Licensing Authority may only refuse to renew a permit on the grounds that:

- an authorised local authority officer has been refused access to the premises without reasonable excuse
- renewal would not be reasonably consistent with the licensing objectives.

In this respect, the licensing authority will have the benefit of having consulted the chief officer of police and will be aware of any concerns that have arisen about the use of the premises during the life of the permit.

4.77 The duration of the permit will not be curtailed while a renewal application is pending, including an appeal against a decision not to renew.

Automatic entitlement to two gaming machines

4.78 Premises licensed to sell alcohol for consumption on the premises are automatically entitled to have two gaming machines (of category C or D) (see **Appendix E**). The person who holds the on-premises alcohol licence must give notice to the Licensing Authority of their intention to make gaming machines available for use and must pay the prescribed fee.

4.79 This is not an authorisation procedure. The Licensing Authority has no discretion to consider the notification or to turn it down. The only matter to determine whether the person applying for the automatic gaming machine entitlement is the holder of the alcohol licence and whether the prescribed fee has been paid. There is no statutory requirements for premises to display a notice of their automatic entitlement to gaming machines.

4.80 The Licensing Authority expects licence holders making machines available in accordance with their automatic entitlement to comply with the Gambling Commission's code of practice for gaming machines in clubs and premises with an alcohol licence.

4.81 The Licensing Authority can remove the automatic authorisation in respect of any particular premises, by making an order under section 284 of the Act. The Licensing Authority can make such an order if:-

- provision of the machines is not reasonably consistent with the pursuit of the licensing objectives;
- gaming has taken place on the premises that breaches a condition of section 282 of the Act (i.e. that written notice has been provided to the Licensing Authority, that a fee has been provided and that any relevant code of practice issued by the Gambling Commission about the location and operation of the machine has been complied with);
- the premises are mainly used for gaming; or
- an offence under the Act has been committed on the premises.

Before making an order, the Licensing Authority will give the holder at least 21 days' notice of the intention to make the order and will consider any representations that they may make. The Licensing Authority will hold a hearing if the holder requests and will comply with other procedural requirements set out in regulations. If there is no appeal, the order will take effect 21 days after the notice of intention was given. The Licensing Authority must give the holder a copy of the order and reasons for its decision. The holder may appeal to the Magistrates Court.

(Alcohol) Licensed premises gaming machine permits

4.82 If a premises wishes to have more than two machines, then it needs to apply for a permit. Such a permit can authorise the provision of any number of category C or D gaming machines within the relevant licensed premises. The Licensing Authority will consider that application based upon the licensing objectives and have regard to any guidance issued by the Gambling Commission and also such matters as they think relevant. In particular the Licensing Authority will have regard to the size and nature of the premises, the number of gaming machines requested and the ability of the licence holder to comply with the relevant code of practice.

4.83 The Licensing Authority considers that "such matters" will be decided on a case-by-case basis but generally there will be regard to the need to protect children and vulnerable persons from harm or being exploited by gambling and will expect applicants to satisfy the authority that there will be sufficient measures to ensure that persons under 18 years do not have access to the adult only gaming machines.

Measures which may satisfy the Authority that there will be no access may include the adult machines being in sight of the bar, or in the sight of staff, who will monitor that the machines are not being used by those under 18 years. Notices and signage may also be of help. As regards the protection of vulnerable persons, applicants may wish to consider the provision of information leaflets / helpline numbers for organisations such as GamCare.

4.84 The Licensing Authority may also require an applicant to submit a plan of the premises showing where the gaming machines are to be located and showing the position of the bar.

4.85 It is recognised that some alcohol-licensed premises may apply for a premises licence under the Act for their non-alcohol licensed areas. Any such application would most likely need to be applied for and dealt with as a premises licence under the Act but the individual circumstances are likely to need to be looked at in each case to assess the requirements of the Act.

4.86 The application does not require notification to the Commission or police before determination. However, the Licensing Authority is able to specify this as a requirement should they see fit.

4.87 The Licensing Authority may grant or refuse an application. In granting the application, it may vary the number and category of gaming machines authorised by the permit. If granted, the Licensing Authority will issue the permit as soon as possible after that. Where they refuse the application they will notify the applicant as soon as possible, setting out the reasons for refusal. The Licensing Authority will not refuse an application or grant it for a different number or category of machines, unless they have notified the applicant of their intention to do so and given the applicant an opportunity to make representations, orally, in writing, or both.

4.88 Holders of permits must comply with any Code of Practice issued by the Gambling Commission about the location and operation of the machine.

4.89 The Licensing Authority is able to cancel a permit. It may only do so in specified circumstances which include if the premises are used wholly or mainly by children or young persons or if an offence under the Act has been committed. Before it cancels a permit the Licensing Authority will notify the holder, giving 21 days' notice of intention to cancel, consider any representations made by the holder, hold a

hearing if requested, and comply with any other prescribed requirements relating to the procedure to be followed. Where the Licensing Authority cancels the permit, the cancellation does not take effect until the period for appealing against that decision has elapsed or, where an appeal is made, until the appeal is determined.

The Licensing Authority can also cancel a permit if the holder fails to pay the annual fee, unless failure is the result of an administrative error. The court may order forfeiture of the permit if the holder is convicted of a relevant offence.

Exempt Gaming

4.90 Exempt gaming is generally permissible in any club. Such gaming must be equal chance gaming and be ancillary to the purposes of the club. This provision is automatically available to all such premises but is subject to statutory stakes and prize limits determined by the Secretary of State.

Equal chance gaming is gaming that does not involve staking against a bank and the chances of winning are equally favourable to all participants. It includes games such as dominoes, cribbage, bingo and poker.

The Secretary of State has set both daily and weekly prize limits for exempt gaming. Different higher stakes and prizes are allowed for exempt gaming in clubs than are allowed in alcohol-licensed premises and details of these can be found on the Gambling Commission's website.

4.91 Clubs may levy a charge for participation in equal chance gaming under the exempt gaming rules. The amount they may charge is as prescribed in regulations and the relevant details can be found on the Gambling Commission's website. However, in order to qualify as exempt gaming, clubs may not charge a rake on games (a commission or fee deducted from the prize fund), or levy or deduct an amount from stakes or winnings.

4.92 The Licensing Authority expects exempt gaming in clubs to comply with the Gambling Commission's code of practice on equal chance gaming in clubs and premises with an alcohol licence.

Prize Gaming Permits

4.93 Gaming is prize gaming if the nature and size of the prize is not determined by the number of people playing or the amount paid for or raised by the gaming. Normally the prizes are determined by the operator before play commences.

A prize gaming permit is a permit issued by the Licensing Authority to authorise the provision of facilities for gaming with prizes on specified premises.

4.94 An application for a permit can only be made by a person who occupies or plans to occupy the relevant premises and if the applicant is an individual, he must be aged 18 or over. An application for a permit cannot be made if a premises licence or club gaming permit is in effect for the same premises under the Gambling Act 2005. The application must be made to the Licensing Authority in whose area the premises are wholly or partly situated.

4.95 When applying for a permit, the applicant should set out the types of gaming that they intend to offer and be able to demonstrate:-

- that they understand the limits to stakes and prizes that are set out in Regulations;
- and that the gaming offered is within the law
- The Licensing Authority requires applicants for prize gaming permits to provide a Basic Disclosure certificate issued by the Disclosure and Barring Service (DBS) within a period of one month before the application is made.

4.96 The application must be submitted on the standard form and be accompanied by the prescribed application fee. The Licensing Authority also requires the application to be accompanied by a plan of the premises that will be used for gaming with prizes.

In considering an application, the licensing authority shall have regard to the Gambling Commission's Guidance to Licensing Authorities and will also have regard to the licensing objectives.

4.97 The Licensing Authority can grant or refuse an application for a permit, but cannot attach conditions; however, there are mandatory conditions in the Act with which permit holders must comply. They are:-

- the limits on participation fees, as set out in regulations, must be complied with;
- all chances to participate in the gaming must be allocated on the premises on which the gaming is taking place and on one day;
- the game must be played and completed on the day the chances are allocated; and the result of the game must be made public in the premises on the day that it is played;
- the prize for which the game is played must not exceed the amount set out in regulations (if a money prize), or the prescribed value (if non-monetary prize); and
- participation in the gaming must not entitle the player to take part in any other gambling.

The Licensing Authority will grant a prize gaming permit only if they have consulted the chief officer of police about the application. The Licensing Authority will take account of any objections that the police may wish to make which are relevant to the licensing objectives.

Relevant considerations would include the suitability of the applicant in terms of any convictions that they may have that would make them unsuitable to operate prize gaming; and the suitability of the premises in relation to their location and any issues concerning disorder.

A permit cannot be issued in respect of a vessel or a vehicle.

The Licensing Authority will not refuse an application unless they have notified the applicant of the intention to refuse and the reasons for it and given them an opportunity to make representations orally or in writing or both.

If granted, the permit will have effect for ten years, unless it ceases to have effect, lapses or is renewed. There is no annual fee for prize gaming permits.

The permit may lapse for a number of reasons:

- if the holder ceases to occupy the premises
- if an individual permit holder dies, becomes incapable by reason of mental or physical incapacity, becomes bankrupt, or sequestration of his estate is ordered
- if a company holding the permit goes into liquidation
- if the holder (for example a partnership) otherwise ceases to exist.

4.98 An application for renewal of a permit must be made during the period beginning six months before the permit expires and ending two months before it expires. The procedure for renewal is the same as for an application.

A permit will not cease to have effect while a renewal application is pending, including an appeal against a decision not to renew.

Club Gaming and Club Machines Permits

4.99 Members Clubs and Miners' welfare institutes (but not Commercial Clubs) may apply for a Club Gaming Permit or a Club Gaming Machines permit. The Club Gaming Permit will enable the premises to provide gaming machines (up to 3 machines from categories B3A, B4, C or D), equal chance gaming and games of chance as set out in forthcoming regulations. A Club Gaming machine permit will enable the premises to provide gaming machines (up to 3 machines from categories B3A, B4, C or D). (Only one of the 3 machines can be a category B3A).

4.100 Members clubs must have at least 25 members and be established and conducted "wholly or mainly" for purposes other than gaming, unless the gaming is permitted by separate regulations. (It is anticipated that this will cover bridge and whist clubs, which will

replicate the position under the Gaming Act 1968). A members' club must be permanent in nature, not established to make commercial profit, and controlled by its members equally. Examples include working men's clubs, branches of the Royal British Legion and clubs with political affiliations.

4.101 The Licensing Authority will therefore require applicants for permits to supply sufficient information and documents to enable it to satisfy itself that the club meets the requirements of the Act to obtain a Club Gaming Permit.

4.102 The Licensing Authority may only refuse an application on the grounds that:-

(a) the applicant does not fulfil the requirements for a members' or commercial club or miners' welfare institute and therefore is not entitled to receive the type of permit for which it has applied;
(b) the applicant's premises are used wholly or mainly by children and/or young persons;
(c) an offence under the Act or a breach of a permit has been committed by the applicant while providing gaming facilities;
(d) a permit held by the applicant has been cancelled in the previous ten years; or
(e) an objection has been lodged by the Gambling Commission or the police.

4.103 There is a 'fast-track' procedure available under the Act for premises which hold a Club Premises Certificate under the Licensing Act 2003 (Schedule 12 paragraph 10). Under the fast-track procedure there is no opportunity for objections to be made by the Gambling Commission or the police, and the grounds upon which the Licensing Authority can refuse a permit are reduced. The grounds on which an application under the process may be refused are:-

(a) that the club is established primarily for gaming, other than gaming prescribed under schedule 12;
(b) that in addition to the prescribed gaming, the applicant provides facilities for other gaming; or
(c) that a club gaming permit or club machine permit issued to the applicant in the last ten years has been cancelled."

4.104 There are statutory conditions on club gaming permits that no child uses a category B or C machine on the premises and that the holder complies with any relevant provision of a code of practice about the location and operation of gaming machines.

4.105 Club Gaming Permits and Club Machine Permits will have effect for ten years, unless it ceases to have effect because it is surrendered or lapses or is renewed. However, a permit granted under the fast-track procedure does not expire, unless it ceases to have effect because it is surrendered, cancelled or forfeited or it lapses.

A permit will lapse if the holder of the permit stops being a club or miners' welfare institute, or if it no longer qualifies under the fast-track system for a permit. In addition, a permit will cease to have effect upon being surrendered to the Authority. A notice to surrender must be accompanied by the permit or a statement explaining why it cannot be produced. The Licensing Authority must inform the Police and the Commission when a permit has been surrendered or lapsed.

The Licensing Authority may cancel the permit if:

- the premises are used wholly by children and/or young persons
- an offence or breach of a permit condition has been committed in the course of gaming activities by the permit holder.

Reference here to 'a permit condition' means a condition in the Act or in regulations that the permit is operating under.

Before cancelling a permit, the Licensing Authority will give the permit holder at least 21 days' notice of the intention to cancel and consider any representations that they may make.

The Licensing Authority will hold a hearing if the permit holder so requests and will comply with any other procedural requirements set out in regulations. If there is no appeal, the cancellation will take effect 21 days after notice of the intention to cancel was given. The Licensing Authority will notify the permit holder, the Commission and the police that the permit has been cancelled and the reasons for the cancellation.

4.106 In accordance with paragraph 24 of Schedule 12 of the Act, an application for renewal of a permit must be made during the period beginning three months before the licence expires and ending six weeks before it expires. The procedure for renewal is the same as for an application.

The duration of the permit will not be curtailed while a renewal application is pending, including an appeal against a decision not to renew.

If, at the time a permit is renewed, the applicant holds a club premises certificate, the fast-track procedure will apply as it does when application is first made for the permit.

Temporary Use Notices

4.107 These allow the use of premises for gambling where there is no premises licence but where a gambling operator wishes to use the premises temporarily for providing facilities for gambling.

As with "premises", the definition of "a set of premises" will be a question of fact in the particular circumstances of each notice that is given. In the Act "premises" is defined as including "any place". In

considering whether a place falls within the definition of "a set of premises", the Licensing Authority will need to look at, amongst other things, the ownership/occupation and control of the premises. Licensing Authority will consider objecting to notices where it appears that their effect would be to permit regular gambling in a place that could be described as one set of premises.

Premises that might be suitable for a temporary use notice would include hotels, conference centres and sporting venues. A temporary use notice may only be granted to a person or company holding a relevant operating licence.

Temporary use notices may only be used to permit the provision of facilities for equal chance gaming, where the gaming is intended to produce a single overall winner. Equal chance gaming is gaming which does not involve playing or staking against a bank and gives equally favourable chances to all participants. Examples of equal chance gaming include games such as dominoes, cribbage, bingo and poker.

Occasional Use Notices for Betting on Tracks

4.108 The Licensing Authority has very little discretion as regards these notices aside from ensuring that the statutory limit of 8 days in a calendar year is not exceeded. The Licensing Authority will however consider the definition of a *'track'* and whether the applicant is permitted to avail him/herself of the notice.

Whilst tracks are normally thought of as permanent racecourses, this can also include land which has a number of uses for example agricultural land upon which a point-to-point meeting takes place. Land used temporarily as a track can qualify, provided races or sporting events take place or will take place there. The track need not be a permanent fixture.

4.109 The Licensing Authority will share information with the Gambling Commission in relation to any Occasional Use Notices received. The Licensing Authority may also work in partnership with the Gambling Commission to carry out test purchase operations involving licensed operators that are providing facilities for betting in reliance on an Occasional Use Notice. Further information regarding Occasional Use Notices can be found at: https://www.gamblingcommission.gov.uk/authorities/guide/occasional-use-notices-ouns

Lotteries

4.110 A lottery is any arrangement that satisfies all of the criteria contained within the statutory description of either a simple lottery or a complex lottery, under s.14 of the Act.

An arrangement is a simple lottery if:

- persons are required to pay to participate
- one or more prizes are allocated to one or more members of a class
- the prizes are allocated by a process which relies wholly on chance.

An arrangement is a complex lottery if:

- persons are required to pay to participate
- one or more prizes are allocated to one or more members of a class
- the prizes are allocated by a series of processes
- the first of those processes relies wholly on chance.

conducted:

- for charitable purposes, as defined in s.2 of the Charities Act 2006
- for the purpose of enabling participation in, or of supporting, sport, athletics or a cultural activity
- for any other non-commercial purpose other than that of private gain.

It is inherent in this definition that the society must have been established for one of the permitted purposes as set out in section 19 of the Act, and that the proceeds of any lottery must be devoted to those purposes. It is not permissible to establish a society whose sole purpose is to facilitate lotteries.

The Licensing Authority will consider the Gambling Commission's additional guidance relating to small society lottery applications.

There are a number of lotteries that are considered exempt therefore requiring no licence. Further details regarding exempt lotteries can be found at https://www.gamblingcommission.gov.uk/public-and-players/guide/page/types-of-lottery-you-can-run-without-a-licence

4.111 The Licensing Authority with which a small society lottery is required to register must be in the area where their principal office is located. If the Licensing Authority believes that a society's principal office is situated in another area, it will inform the society and the other Licensing Authority as soon as possible.

4.112 Applications for small society lottery registrations must be in the form prescribed by the Secretary of State and be accompanied by both the required registration fee and all necessary documents required by the Licensing Authority to assess the application.

If there is any doubt as to the status of a society that makes application for registration to carry on small society lotteries, the Licensing Authority may require the society to provide documentary

evidence in support of their application. The types of evidence that may be required include, but are not restricted to-

- A list of the members of the society
- The society's constitution or a similar document setting out the aims and objectives of the society and its governance arrangements
- A written declaration from the applicant stating that they represent a *bona fide* non-commercial society.

4.113 The Licensing Authority shall refuse an application for registration if in the period of five years ending with the date of the application—

- an operating licence held by the applicant for registration has been revoked under section 119(1) of the Act, or
- an application for an operating licence made by the applicant for registration has been refused.

The Licensing Authority may refuse an application for registration if they think that—

- the applicant is not a non-commercial society,
- a person who will or may be connected with the promotion of the lottery has been convicted of a relevant offence, or
- information provided in or with the application for registration is false or misleading.

The Licensing Authority may only refuse an application for registration after the society has had the opportunity to make representations at a formal hearing. If the Licensing Authority is minded to refuse registration, it will inform the society of the reasons why it is minded to do so and provide it with an outline of the evidence on which it has reached that preliminary conclusion, in order to enable representations to be made.

Any representations received will be considered at a formal hearing and the following principles will be applied when reaching a decision:

- Whether allowing the registration of the society would be consistent with the Act
- Whether allowing the registration of the society would be consistent with the promotion of the licensing objectives
- Whether allowing the registration of the society would be consistent with any relevant code of practise issued by the Gambling Commission

Promotion of small society lotteries once registered

4.114 Participation in a lottery is a form of gambling, and as such the

Licensing Authority requires societies that it registers to conduct their lotteries in a socially responsible manner and in accordance with the Act.

4.115 The Act requires that lottery tickets may only be sold by persons that are aged 16 or over to persons that are aged 16 or over.

As the minimum age for participation in a lottery is 16, the Licensing Authority expects those societies that it registers to have effective procedures to minimise the risk of lottery tickets being sold to children, including procedures for:

- checking the age of apparently underage purchasers of lottery tickets
- taking action where there are unlawful attempts to purchase tickets.

4.116 Lotteries may involve the issuing of physical or virtual tickets to participants (a virtual ticket being non-physical, for example in the form of an email or text message). All tickets must state:

- the name of the promoting society
- the price of the ticket, which must be the same for all tickets
- the name and address of the member of the society who is designated as having responsibility at the society for promoting small lotteries or, if there is one, the external lottery manager (ELM)
- the date of the draw, or information which enables the date to be determined.

The requirement to provide this information can be satisfied by providing an opportunity for the participant to retain the message electronically or print it.

4.117 With regards to where small society lottery tickets may be sold, the Licensing Authority applies the following criteria to all small society lottery operators:

Lottery tickets must not be sold to a person in any street. For these purposes 'street' includes any bridge, road, lane, footway, subway, square, court, alley or passage (including passages through enclosed premises) whether a thoroughfare or not. Tickets may, however, be sold in a street from a static structure such as a kiosk or display stand. Tickets may also be sold door to door.

This approach is consistent with the operating licence conditions imposed upon operators of large society lotteries and local authority lotteries.

Financial Returns

4.118 As the purpose of permitted lotteries is to raise money for non-commercial causes, the Act requires that a minimum proportion of the money raised by the lottery is channelled to the goals of the society that promoted the lottery. If a small society lottery does not comply with these limits it will be in breach of the Act's provisions, and consequently be liable to prosecution.

The limits are as follows:

- at least 20% of the lottery proceeds must be applied to the purposes of the society
- no single prize may be worth more than £25,000
- rollovers between lotteries are only permitted where every lottery affected is also a small society lottery promoted by the same society, and the maximum single prize is £25,000
- every ticket in the lottery must cost the same and the society must take payment for the ticket fee before entry into the draw is allowed

4.119 The Act sets out the information that the promoting society of a small society lottery must send as returns to the licensing authority with which it is registered, following each lottery held. This information allows the Licensing Authority to assess whether financial limits are being adhered to and to ensure that any money raised is applied for the proper purpose.

The following information must be submitted:

- the arrangements for the lottery – specifically the date on which tickets were available for sale or supply, the dates of any draw and the value of prizes, including any donated prizes and any rollover
- the total proceeds of the lottery
- the amounts deducted by the promoters of the lottery in providing prizes, including prizes in accordance with any rollovers
- the amounts deducted by the promoters of the lottery in respect of costs incurred in organising the lottery
- the amount applied to the purpose for which the promoting society is conducted (this must be at least 20% of the proceeds)
- whether any expenses incurred in connection with the lottery were not paid for by deduction from the proceeds, and, if so, the amount of expenses and the sources from which they were paid.

The Act also requires that returns must:

- be sent to the Licensing Authority no later than three months after the date of the lottery draw, or in the case of 'instant lotteries' (scratch cards) within three months of the last date on which tickets were on sale
- be signed (electronic signatures are acceptable if the return is sent electronically) by two members of the society, who must be aged 18 or older, are appointed for the purpose in writing by the society or, if it has one, its governing body, and be accompanied by a copy of their letter or letters of appointment.

The Licensing Authority allows for returns to be sent to them both electronically and manually. The form of returns required can be downloaded from the Licensing Authority's website.

Where societies run more than one lottery in a calendar year, the Licensing Authority will monitor the cumulative totals of returns to ensure that societies do not breach the annual monetary limit of £250,000 on ticket sales.

The Licensing Authority will notify the Commission if returns reveal that a society's lotteries have exceeded the values permissible, and such notifications will be copied to the society in question.

Revocation of a registration

4.120 The Licensing Authority may determine to revoke the registration of a society if it thinks that they would have had to, or would be entitled to, refuse an application for registration if it were being made at that time.

Revocations cannot take place unless the society has been given an opportunity to make representations at a hearing. In preparation for this, the Licensing Authority will inform the society of the reasons why it is minded to revoke the registration and provide them with the evidence on which it has reached that preliminary conclusion.

Any representations received will be considered at a formal hearing and the following principles will be applied when reaching a decision:

- Whether allowing the registration of the society to continue would be consistent with the Act
- Whether allowing the registration of the society to continue would be consistent with the promotion of the licensing objectives
- Whether allowing the registration of the society to continue would be consistent with any relevant code of practise issued by the Gambling Commission.

5. Policy Details

5.1 In developing this policy the Council has had regard to:

(a) The Gambling Act 2005 and subsequent regulations

(b) Section 17 of the Crime and Disorder Act 1998 to take all responsible steps to reduce crime and disorder within the county;

(c) The Regulators Compliance Code (set out under the Legislative and Regulatory Reform Act 2006) not to impede economic progress by the regulations we set out and to particularly consider the impact of regulations on small businesses; and

(d) The Provision of Services Regulations 2009 to ensure requirements are:

i) non–discriminatory
ii) justified by an overriding reason relating to the public interest
iii) proportionate to that public interest objective
iv) clear and unambiguous
v) objective
vi) made public in advance, and transparent and accessible

6. Consultation and Engagement

6.1 The Council consulted on this policy between ~~5 September and 31 October 2022~~ *1 July and 12 August 2024.*

Consultation took place with a number of agencies, some of which are detailed at Appendix C. A full list of the persons / bodies who were consulted can be provided upon receipt of a written request.

7. Performance and Risk Management

7.1 The Policy will be regularly reviewed and monitored to ensure that it reflects current legislation, its effective, up to date and achieving a responsible regulatory framework for Cornwall.

7.2 This will be achieved by monitoring the outcome of hearings, appeals through Magistrates courts, developments in legislation, by having regard to stated cases, local needs and economic impacts.

7.3 The Council will ensure that Members and Council officers are involved in the development and implementation of this policy, the enforcement of the licensing regime and anyone involved in the day to day operation of the service receives adequate training.

7.4 Training will be carried out following any review and amendment of the policy, alterations to legislative requirements or fundamental changes to the provision of the licensing service.

7.5 Three-yearly policy reviews are included within the Neighbourhoods and Public Protection Service Plan.

8. Communicating the Policy

8.1 This policy is available on the Council's website and will be made available at the main Council Offices in ~~Camborne and~~ Bodmin. In addition, responsible authorities will be provided with a copy of this policy document.

8.2 Any amendment to the policy will be communicated to the community by way of a press release on the Council's website. Persons having been actively involved in any consultation on the policy will be notified directly.

9. Breaches and Non-Compliance

Inspection and Enforcement

9.1 The principles which the Licensing Authority will apply, in exercising its functions with respect to the inspection of premises and the powers it is given to institute criminal proceedings in respect of the offences specified, will be guided by any advice issued by the Gambling Commission and will endeavour to be: -

- Proportionate: only intervene when necessary: remedies will be appropriate to the risk posed and costs identified and minimised;
- Accountable: able to justify decisions and be subject to public scrutiny;
- Consistent: be joined-up and implement rules and standards fairly;
- Transparent: be open and keep regulations simple and user-friendly; and
- Targeted: regulate by focussing on the problem, and minimising side effects.

Under the Legislative and Regulatory Reform Act 2006, any person exercising a specified regulatory function has a legal duty to have regard to the statutory principles of good regulation in the exercise of the function. These provide that regulatory activities should be carried out in a way which is transparent, accountable, proportionate, and consistent and should be targeted only at cases in which action is needed. The Gambling Commission has regard to these principles in relation to its responsibilities and also has regard to the requirements of the Regulators' Compliance Code ("the Code"). The purpose of the Code is to promote efficient and effective approaches to regulatory inspection and enforcement which improve regulatory outcomes without imposing unnecessary burdens on business

9.2 In accordance with the Gambling Commission's Guidance the Licensing Authority will endeavour to avoid duplication with other regulatory regimes so far as is reasonably practicable.

9.3 The Licensing Authority will endeavour to adopt targeted risk-based inspection regimes in accordance with any Codes of Practice issued concerning the inspection of premises and will also have regard to any guidance or risk models proposed by the Gambling Commission.

9.4 The main enforcement role for the Licensing Authority under the Act will be to ensure that premises issued with premises licences and other permissions it authorises comply with the law. Under the provisions of the Act, the Licensing Authority will also follow up any complaints and enquiries about premises and persons / organisations.

9.5 The Gambling Commission will be the enforcement body for the operating licences and personal licences that it issues. The Licensing Authority will, therefore, not deal directly with any concerns relating to the manufacture, supply or repair of gaming machines, but will notify the Gambling Commission of any such concerns.

9.6 The Licensing Authority, in exercising its regulatory functions, will be mindful of any advice issued as a result of the developments of the work of the Department for Business, Innovation and Skills. For more information go to http://www.bis.gov.uk/.

9.7 Any enforcement action taken on any premises or individual will be in accordance with Cornwall Council's Enforcement Policy.

Exchange of Information

9.8 The Licensing Authority will ensure it exercises its functions in accordance with the laws on exchange of information with respect to the exchange of information between it and the Gambling Commission and its functions under the Act with respect to the exchange of information between it and other persons listed in Schedule 6 to the Act.

9.9 The Licensing Authority will act in accordance with the provisions of the Act in its exchange of information whilst complying with the provisions of the General Data Protection Regulations. The Licensing Authority will have regard to any guidance issued by the Gambling Commission as well as any relevant regulations issued by the Secretary of State under the powers provided in the Act.

9.10 The Licensing Authority will have regard to any advice given by the Gambling Commission when establishing local protocols regarding information exchange with other bodies and which will be available upon written request.

9.11 Representations made by interested parties will be disclosed in full to the applicant and to Members (councillors) determining the application at any hearing. Disclosure will normally include the identity of the person / body making the representation. Anonymous representations will not be accepted as the Licensing Authority must

be satisfied that the representation is made by an 'interested party' as defined in the Act.

10. Information and Training

10.1 The information can be viewed at www.opsi.gov.uk

- Gambling Act 2005
- Gambling Commission Guidance issued to Local Authorities
- Gambling Commission Codes of Practice
- The Policing and Crime Act 2009
- Crime and Disorder Act 1998
- Human Rights Act 1998
- Equality Act 2010

11. Evaluation and Review

This policy will be reviewed on a three yearly basis. Any proposed amendments to the Policy will be fully consulted upon, prior to re-adoption by the Council.

This policy will be subject to review by 31 January 2026 although the policy may be subject to further review changes as a result of the forthcoming Gambling Review.

12. Further Information *

Useful web-links:-

Gambling Act 2005 (legislation.gov.uk)

The Gambling Act 2005 (Premises Licences and Provisional Statements) Regulations 2007 (legislation.gov.uk)

Guidance to licensing authorities - Gambling Commission

Gambling Commission website - Gambling Commission

The Gambling Act 2005 (Mandatory and Default Conditions) (England and Wales) Regulations 2007 (legislation.gov.uk)

Licence Conditions and Codes of Practice - Gambling Commission

Pubs and clubs toolkit - Gambling Commission

Premises assessments toolkit and Primary Authority agreements - Gambling Commission

Occasional use notices (OUNs) - Gambling Commission

Types of lottery you can run without a licence - Gambling Commission

Data Protection Act 2018 (legislation.gov.uk)

Office for Product Safety and Standards

www.GamCare.org.uk
Support and advice to keep your gambling under control | BeGambleAware

Wellbeing guidance Gambling (cornwall.gov.uk)

Orange Button Community Scheme - Cornwall Council

Mental health safety plans - Cornwall Council

Mental wellbeing guides - Cornwall Council

* This section will be kept under review and may be updated by the Licensing Service

If any of the web-links referred to above or throughout this document are not able to be accessed, please contact the Licensing Service to request the necessary information be emailed or posted.

If you would like this information in another format please contact:

Cornwall Council
County Hall
Treyew Road
Truro TR1 3AY

Telephone: **0300 1234 100**

Email: **enquiries@cornwall.gov.uk**

www.cornwall.gov.uk

Please consider the environment. Only print this document if it cannot be sent electronically.

Appendix A – Glossary / Definitions

The "Act"	means the Gambling Act 2005
Adult Gaming Centres (AGC)	Premises with an adult gaming centre premises licence, authorising the use of Category B machines (restricted to B3 and B4 machines).
Amusement Arcades	These are not referred to as such in the Act. See Adult Gaming Centres and Family Entertainment Centres (Licensed & Unlicensed).
BACTA	British Amusement Catering Trade Association
Betting	'Betting' means making or accepting a bet on the outcome of a race, competition, or any other event; the likelihood of anything occurring or not occurring; or whether anything is true or not true.
Betting Machines	A machine which has been designed or adapted for use to bet on future real events, such as horse racing, and used as a substitute for placing a bet over a counter.
Bingo	Bingo has no statutory definition in the Act. It has its ordinary and natural meaning. The distinction between cash bingo, where cash prizes were derived from the stakes and prize bingo, where prizes were not directly related to the stakes paid, under the previous legislation has been removed for commercial operators. A holder of a bingo operating licence will be able to offer any type of bingo game, whether cash or prize. Alcohol-licensed premises, clubs and miners' welfare institutes are able to offer bingo in all forms (up to a total weekly prize value of less than £2,000). Prize bingo is traditionally played in arcades or travelling funfairs. For these operators, prize bingo is subsumed within the allowances for prize gaming in the Act. This means that AGCs, both licensed and unlicensed FECs, travelling fairs, and any premises with a prize gaming permit will be able to offer prize gaming, which includes prize bingo. Limits have been set in Government Regulations.
Child / Children & Young persons	In the Act:- **'Child'** means an individual who is less than 16 years old '**Young person**' means an individual who is 16 -18yrs old
Club Gaming Permits	Issued by the Licensing Authority authorising the provision of facilities for gaming on premises where a members' club or miners' welfare institute operates. Such permits authorise up to 3 gaming machines (Categories B3A, B4, C or D but note that only one of the 3 machines can be a B3A category), the provision of facilities for some gaming activities, and facilities for games of chance subject to regulations etc.

Club Machine Permits	Issued by the Licensing Authority authorising up to 3 gaming machines (Categories B3A, B4, C or D but note that only one of the 3 machines can be a B3A category) on premises where a members' club or miners' welfare institute operates (and for use only by members of the club/institute and their guests). Conditions are applied to such permits as required by Section 273 of the Act.
Equal chance gaming	This is a game where the chances of winning are equally favourable to all participants, and which does not involve playing or staking against a "bank". It is immaterial how the "bank" is described and whether or not it is controlled by a player.
Exempt activities	Private betting is betting which takes place between inhabitants of the same premises or between employees of the same employer. Private gaming (which is gaming that takes place in private dwellings and on domestic occasions) is exempt from licensing or registration providing that no charge is made for participating; only equally chance gaming takes place; and it does not occur in a place to which the public have access.
Gambling	Defined as either gaming, betting or participating in a lottery.
Games of chance	Includes games that involve both chance and skill. This includes games in which skill can eliminate an element of chance and includes games that are presented as involving an element of chance. It does not include a sport. Playing a game of chance need not involve other participants.
Gaming	Playing a game of chance for a prize.
Gaming machines	A machine designed or adapted for use by individuals to gamble (whether or not the machine can also be used for other purposes). This does not include a machine designed to bet on future real events, or to play bingo. See also **Appendix E**.
Licensed Family Entertainment Centres (LFECs)	Premises (other than AGCs) which are wholly or mainly used for provision of gaming machines and licensed via an **'FEC premises licence'** for the provision of Category C or D gaming machines.
"Licensing Authority"	means Cornwall Council
Non-commercial gambling	When no part of the proceeds/profits will be for private gain. Proceeds/profits are sums raised by the organisers, for example, by way of fees for entrance or participation, or by way of stakes, minus an amount deducted by the organiser in respect of costs reasonably incurred in organising the event including the provision of a prize. Certain conditions and limits apply which are prescribed in the Act and its Regulations.

Occasional Use Notices	Notice given under section 39 in respect of a track which is intended to be used to accept bets. The notice can only be given by a person who is an occupier of the track or responsible for the administration of events on the track.
Off-course betting	Off-course betting operators may operate self-contained betting premises within a track premises as well as betting premises away from the track
On-course betting	An on-course betting operator is one who comes onto a track temporarily while races are taking place and operates at the track side.
Operating licence	An operating licence is a licence issued to the gambling premises operator by the Gambling Commission.
Personal licence	A personal Licence is a licence issued to individuals by the Gambling Commission.
Pool betting	Betting is 'pool betting' if made on terms that all or part of winnings: - (a) shall be determined by reference to the aggregate of stakes paid or agreed to be paid by the persons betting (b) shall be divided among the winners; or (c) shall or may be something other than money
Premises Licences	A licence issued by the Licensing Authority, which authorises premises to be used for:- a) the operation of a casino (a 'casino premises licence') b) the provision of facilities for the playing of bingo (a 'bingo premises licence') c) making Category B, C or D gaming machines available for use (an 'adult gaming centre premises licence') d) making Category C and D gaming machines available for use (a ' family entertainment centre premises licence') or e) the provision of facilities for betting, whether by making or accepting bets, by acting as a betting intermediary or providing other facilities for the making or accepting of bets (a 'betting premises licence')
Prize Gaming Permits	Permits issued by the Licensing Authority authorising a person to provide facilities for gaming with prizes on a specified premises. Section 188 of the Act defines gaming as prize gaming if the nature and size of the prizes is not determined by the number of people playing and the amount paid for or raised by the gaming. The prizes will be determined by the operator before play commences.
Provisional Statements	An application for a provisional statement is an application in respect of premises in anticipation (by the applicant) that the premises will be constructed, altered or occupied for the purpose. A provisional statement (if granted by the

	Licensing Authority) is followed by an application for a premises licence once the premises are appropriated, altered or built, and the Licensing Authority must then disregard any representations made, unless the representations address matters that could not have been addressed in relation to the provisional statement application or reflect a change in the applicant's circumstances.
Remote gambling	Gambling in which persons participate by the use of remote communication. Remote communication under section 4 of the Gambling Act 2005 means using the internet, telephone, television, radio or any other kind of electronic or other technology for facilitating communication.
Small society lotteries	Proceeds of the lottery do not exceed £20,000 or, if it is promoted wholly or partly at a time in a calendar year, the aggregate proceeds in a calendar year do not exceed £250,000 (subject to other conditions set out in Part 4 of the Act). A small society lottery is exempt from the licensing requirements providing certain conditions are met, however, the promoting society is required to be registered with the local authority (Part 5).
Street	This is defined in the GA05 (Mandatory and Default Conditions) Regulations as "including any bridge, road, lane, footway, subway, square, court, alley or passageway (including passages through enclosed premises such as shopping malls) whether a thoroughfare or not"
Temporary Use Notices	Notification by the holder of an operating licence that they intend to use an unlicensed premises for gambling on specified days not exceeding 21 days in any 12-month period. Such notices are required to be given to the Licensing Authority at least 3 months prior to the proposed use of the premises.
The Gambling Commission	Established on 1 October 2005, the Commission has responsibility for the regulation of all commercial gambling in Great Britain (other than spread betting or the National Lottery).
Tracks	A horse racecourse, dog track or other premises on any part of which a race or other sporting event takes place or is intended to take place.
Travelling fairs	A 'fair' is a fair consisting wholly or mainly for the provision of amusements, and a 'travelling fair' is a fair held wholly or mainly by persons who travel from place to place for the purpose of providing fairs, and the fair is held at a place which has been used for the provision of a fair on not more than 27 days in that calendar year.
Unlicensed Family Entertainment Centres (uFECs)	Premises (other than AGCs or Licensed FECs) which are wholly or mainly used for the provision of gaming machines (a family entertainment centre) and authorised via an 'FEC gaming machine permit' to make Category D machines available for use in a premises.

Note
All references to the Gambling Commissions' Guidance for Local Authorities refer to the latest version. ~~which was last updated in April 2021.~~

Appendix B - Map of Cornwall

Appendix C – List of Consultees

Consultation included the following agencies; this is not an exhaustive list.

- The Police
- Health Authority
- Local Safeguarding Children Board
- Fire & Rescue Authority
- The Licensing Authority
- The Gambling Commission
- The Local Planning Authority
- Environmental Health
- HM Revenue & Customs
- Casinos and Bingo Premises
- The Bingo Association
- Betting Shops
- Betting and Gaming Council
- Representatives of premises licensed to sell alcohol
- Amusement Arcades/Family Entertainment Centres
- Ten Pin Bowling Centres
- Pools Operators and Lotteries Operators
- Gaming Machine Suppliers & Bookmakers Association
- Gambling Help/Support Organisations
- Other bodies such as Parish Councils, Ward Councillors etc., considered to be bodies representing persons who may be affected by the exercise of the Authority's functions under this Act.

Appendix D

List of Responsible Authorities

Responsible Authority	Address	Telephone / Email
Licensing Authority	Licensing Service Cornwall Council *New County Hall* *Treyew Road* *Truro* *TR1 3AY* ~~P O Box 676~~ ~~Threemilestone~~ ~~Truro~~ ~~TR1 9EQ~~	~~01726 223433~~ *01872 324210* licensing@cornwall.gov.uk
Gambling Commission	Victoria Square House Victoria Square Birmingham B2 4BP	0121 230 6500 info@gamblingcommission.gov.uk
Children Safeguarding Partnership	3rd Floor, North Wing New County Hall Truro TR1 3AY	0300 1234 101 childrenslicencechecks@cornwall.gov.uk
HM Revenues & Customs	HM Revenue & Customs Excise Processing Teams BX9 1GL	0300 322 7072 (option 7) NRUBettingGaming@hmrc.gov.uk

Chief Officer of Police	Devon & Cornwall Constabulary Launceston Police Station Moorland Road Launceston PL15 7HY	01566 771309 *licensing.team@devonandcornwall.pnn.police.uk*
Fire & Rescue Authority	Cornwall Fire and Rescue Service St Austell Community Fire Station Carlyon Road St Austell PL25 4LD	01726 223620 *csadmin@fire.cornwall.gov.uk*
Local Planning Authority	Planning Service Cornwall Council Chy Trevail Beacon Technology Park Bodmin PL31 2FR	01208 265712 planning.enforcement@cornwall.gov.uk
Environmental Health	Environmental Health Cornwall Council ~~Dolcoath Avenue~~ ~~Camborne~~ ~~TR14 8SX~~ *New County Hall, Treyew Road, Truro, TR1 3AY*	0300 1234 212 *businesscompliance@cornwall.gov.uk* *communityandenvironmentalprotection@cornwall.gov.uk*
Any other persons prescribed by regulations made by the Secretary of State	The responsible authorities listed are correct at the time of printing, but the Act allows for additions to be made by way of regulations passed by the Secretary of State. Details of responsible authorities will be provided on request to the Licensing Service and will in any case accompany application forms issued by the licensing service. An up to date list of contact details will also be available from the Council's Licensing Service.	

Responsible authorities also include navigation authorities for vessels moored/ berthed/navigated in any water at a time when used for licensable activities: -

Maritime and Coastguard Agency	Plymouth Main Office New Fish Market Baylys Wharf Sutton Harbour Plymouth PL4 0LH	01752 266211 *mcaplymouthadmin@mcga.gov.uk*
Canal & River Trust	Bumpers Way Bumpers Farm Chippenham SN14 6NG	0303 040 4040 customer.services@canalrivertrust.org.uk
Environment Agency (Head Office)	Rio House Waterside Drive Aztec West Almondsbury BS32 4UD	03708 506506 *enquiries@environment-agency.gov.uk*

Appendix E
Definition of Gaming Machines
Based on Gambling Commission's Guidance to Licensing Authorities

Section 235 of the Act defines a "gaming machine" as "a machine which is designed or adapted for use by individuals to gamble (whether or not it can also be used for other purposes)". This definition is wider than those included in previous gaming legislation and covers all types of gambling activity which can take place on a machine, including betting on virtual events. However, the following should be noted:

- there remains a distinction between skill machines and gaming machines in that skill machines are unregulated; and
- section 235 contains important exemptions for equipment that is not to be considered a gaming machine, even when gambling can be performed on it - for example, a home PC is not to be classed as a gaming machine, even though someone can access remote gambling facilities on it.

Categories of Gaming Machines

Category of machine	Maximum Stake	Maximum Prize
B1	£5	£10,000*
B2	£2	£500
B3	£2	£500
B3A	£2	£500
B4	£2	£400
C	£1	£100
D non-money prize (not crane grab)	30p	£8
D non-money prize (crane grab)	£1	£50
D money prize	10p	£5
D combined money and non-money prize	10p	£8 (of which no more than £5 may be a money prize)
D combined money and non-money prize (coin pusher or penny falls machine only)	20p	£20 (of which no more than £10 may be a money prize)

* with option of maximum £20,000 linked progressive jackpot on premises basis only

It should be noted that these stakes and prizes are subject to change, refer to https://www.gamblingcommission.gov.uk/home.aspx for the most up to date stakes and prizes.

Age restrictions

- Categories B (including B3A machines offering lottery games) and C machines – minimum age of 18 years for all players;
- Category D – no minimum age for players, however the Secretary of State has a reserve of power to set a minimum age for playing category D machines with an associated power to exempt certain machines like penny pushers;
- The holder of a permit or premises licence will have to ensure that he complies with the Codes of Practice issued by the Commission on the location of and access to such machines by children and young persons, and their separation from category C and B machines where those are also located on the same premises.

Summary of Maximum Number of Machines by Premises Type

<table>
<tr><th></th><th colspan="7">Machine category</th></tr>
<tr><th>Premises Type</th><th>A</th><th>B1</th><th>B2</th><th>B3</th><th>B4</th><th>C</th><th>D</th></tr>
<tr><td>Regional casino (machine/table ratio 25-1 up to maximum)</td><td colspan="7">Maximum of 1250 machines
Any combination of machines in categories A to D, within the total limit of 1250 (subject to table ratio)</td></tr>
<tr><td>Large casino (machine/table ratio of 5-1 up to maximum)</td><td></td><td colspan="6">Maximum of 150 machines
Any combination of machines in categories B to D (except B3A machines), within the total limit of 150 (subject to machine / table ratio)</td></tr>
<tr><td>Small casino (machine/table ratio of 2-1 up to maximum)</td><td></td><td colspan="6">Maximum of 80 machines
Any combination of machines in categories B to D (except B3A machines), within the total limit of 80 (subject to machine/ table ratio)</td></tr>
<tr><td>Pre-2005 Act casinos (no machine/table ratio)</td><td></td><td colspan="6">Maximum of 20 machines categories B to D (except B3A machines) or any number of C or D machines instead</td></tr>
<tr><td>Betting premises and tracks occupied by Pool Betting</td><td></td><td></td><td colspan="5">Maximum of 4 machines categories B2 to D (expect B3A machines)</td></tr>
<tr><td>Bingo premises</td><td></td><td></td><td></td><td>maximum of 20% of the total number of gaming machines which are available for use on the premises categories B3 or B4**</td><td></td><td colspan="2">No limit C or D machines</td></tr>
<tr><td>Adult gaming centre</td><td></td><td></td><td></td><td>maximum of 20% of the total number of gaming machines which are available for use on the premises categories B3 or B4**</td><td></td><td colspan="2">No limit C or D machines</td></tr>
<tr><td>(Licensed) Family entertainment centre (with premises licence)</td><td></td><td></td><td></td><td></td><td></td><td colspan="2">No limit on category C or D machines</td></tr>
<tr><td>(Unlicensed) Family</td><td></td><td></td><td></td><td></td><td></td><td></td><td>No limit</td></tr>
</table>

entertainment centre (with permit)							on category D machines
Clubs or miners' welfare institutes with permits					Maximum of 3 machines in categories B3A or B4 to D*		
Qualifying alcohol licensed premises						1 or 2 machines of category C or D automatic upon notification	
Qualifying alcohol licensed premises with gaming machine permit						Number of category C-D machines as specified on permit	
Travelling fair							No limit on category D machines
	A	**B1**	**B2**	**B3**	**B4**	**C**	**D**

* It should be noted that members' clubs and miners' welfare institutes are entitled to site a total of three machines in categories B3A to D and commercial clubs are entitled to a total of three machines in categories B4 to D.

**** Adult gaming centre and bingo premises are entitled to make available a number of Category B gaming machines not exceeding 20% of the total number of gaming machines which are available for use on the premises. The Gambling Commission's available for use guidance makes it clear that for the purpose of calculating the category B machine entitlement in gambling premises, gaming machines should only be counted if they can be played simultaneously by different players without physical hindrance.**

Premises in existence before 13 July 2011 are entitled to make available four (adult gaming centre premises) or eight (bingo premises) category B gaming machines, or 20% of the total number of gaming machines, whichever is greater.

Appendix F

Summary of Licensing Authority delegations permitted under the Gambling Act (Based on Gambling Commission's Guidance to Licensing Authorities April 2021)

Matter to be dealt with	Full Council	Sub-committee of Regulatory Licensing Committee	Officers
Final approval of three year licensing policy	X		
Policy not to permit casinos	X		
Fee setting (when appropriate)	X		
Application for premises licences		Where representations have been received and not withdrawn	Where no representations received/ representations have been withdrawn
Application for a variation to a licence		Where representations have been received and not withdrawn	Where no representations received/ representations have been withdrawn
Application for a transfer of a licence		Where representations have been received from the Commission	Where no representations received from the Commission
Application for a provisional statement		Where representations have been received and not withdrawn	Where no representations received/ representations have been withdrawn
Determination of review of a premises licence		X	
Instigation of review of a premises licence			X
Application for club gaming/ club machine permits		Where objections have been made (and not withdrawn)	Where no objections made/objections have been withdrawn
Cancellation of club gaming/ club machine permits		X	

Matter to be dealt with	Full Council	Sub-committee of Regulatory Licensing Committee	Officers
Applications for other permits			**X**
Cancellation of licensed premises gaming machine permits			**X**
Small Lottery Registration		Where objections have been made (and not withdrawn)	Where no objections made/objections have been withdrawn
Consideration of temporary use notice		Where objections have been made (and not withdrawn)	Where no objections made/objections have been withdrawn
Decision to give a counter notice to a temporary use notice		**X**	
Give notice to dispense with a hearing where all parties consider a hearing is unnecessary and the relevant licensing sub-committee have confirmed in writing their agreement that a hearing is unnecessary			**X**

X Indicates the lowest level to which decisions can be delegated

From: Jaquie Stenson on behalf of Housing Decarbonisation
Sent: Monday, July 8, 2024 08:50
To: Housing Decarbonisation

Subject: FW Draft Housing Decarbonisation Strategy - Public Consultation

Information Classification: PUBLIC

Dear Consultee,

Cornwall Council is asking for your views on a Draft Housing Decarbonisation Strategy which you can find on our Let's Talk and web pages. The consultation period starts on 5 July and closes at 5pm on Monday 16 September 2024.

The draft strategy suggests short, medium and long-term actions along with key principles, targets and a 'Road Map' to inform implementation of housing decarbonisation measures in Cornwall. It looks at how to improve energy efficiency and cut emissions in our homes.

We have a legal duty to decarbonise as set out in the Climate Change Act 2008 (legislation.gov.uk). The Climate Change Action Plan 2019, set out a Carbon Neutral Homes Programme. This focussed on whole house retrofit and new build homes and the Climate Emergency DPD was adopted in February 2023 introducing new, supportive planning policies.

Homes in Cornwall contribute over 20% of total emissions. We know that over 90% of them will need some form of retrofitting to meet our carbon neutral ambitions. Cornish housing is less energy efficient when compared to the rest of the UK and across the Southwest. We have some catching up to do!

The University of Exeter reviewed existing evidence and data on Cornwall Housing stock to provide a baseline for the development of this draft strategy. Their report suggested that emissions from heating and hot water are persistent with no decline over the past 10 years. In fact, fuel combustion emissions are increasing in Cornwall. The draft strategy identifies pathways to reduce emissions from Cornish housing.

How to view the documents and comment
Please visit letstalk.cornwall.gov.uk Housing Decarbonisation to complete our survey and have your say.

If you are unable to view the document in any other way, we may be able to provide a paper copy of the document.

We have arranged some virtual events where you can ask question and discuss the strategy with our team:
Please let us know if you would like to register for one of the sessions by emailing us at: HousingDecarbonisation@cornwall.gov.uk stating which session you would like to attend.

Tuesday 16 July 10am – 11.30am
Thursday 18 July 2pm – 3.30pm

Responses to the strategy should be made through the Let's talk pages, but a form is available on request from HousingDecarbonisation@cornwall.gov.uk

Or by post from:
Cornwall Council,
Housing Decarbonisation Strategy,
New County Hall,
Treyew Road,
Truro,
TR1 3AY

Or call: 0300 123 1118

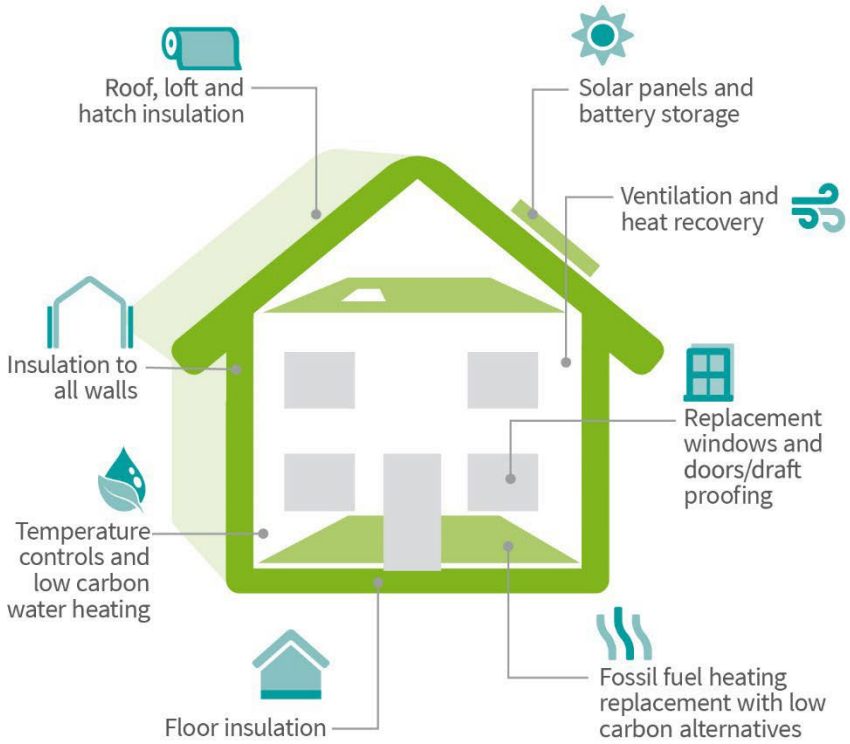
If you don't want to be kept informed on our Housing Decarbonisation programme, please let us know so we can remove your name from our mailing list.

Thank you

Housing Decarbonisation Team

Draft strategy

Cornwall Housing Decarbonisation Strategy



July 2024 | Rev G

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CORNWALL COUNCIL
one and all • onen hag oll

Etude

Contents

Our commitment

Cornwall is rapidly becoming known as a centre for excellence in clean growth and is at the forefront of tackling climate change, facing head-on the huge challenges which lie ahead, whilst embracing our exciting and unique opportunities. Cornwall is striving to lead the country's clean energy revolution.

In 2019, Cornwall Council declared a Climate Emergency and the development of this Housing Decarbonisation Strategy forms part of the ongoing response of Cornwall Council to this emergency. To achieve our ambitions, virtually all emissions arising from heating, cooling and energy use in our homes will need to be eliminated. In 2021, 21% of the total emissions in the county came from our homes.

The Council's overarching mission "To work together for a carbon neutral Cornwall where everyone can start well, live well and age well" provides the focus and the commitment to achieve our net zero ambitions, alongside tackling the inequalities that exist in our society, so that everyone can live a good life in Cornwall.

Our homes are at the very core of enabling everyone to live a good life, and they are a priority in preventing ill-health and building personal resilience. Working to reduce harmful emissions from our housing stock can drive improvements to energy efficiency, tackle fuel poverty, and in turn contribute to improving levels of decency across all tenures, including reducing the incidence of damp and mould. Adopting a holistic approach will improve access to safe, warm and secure homes across all tenures.

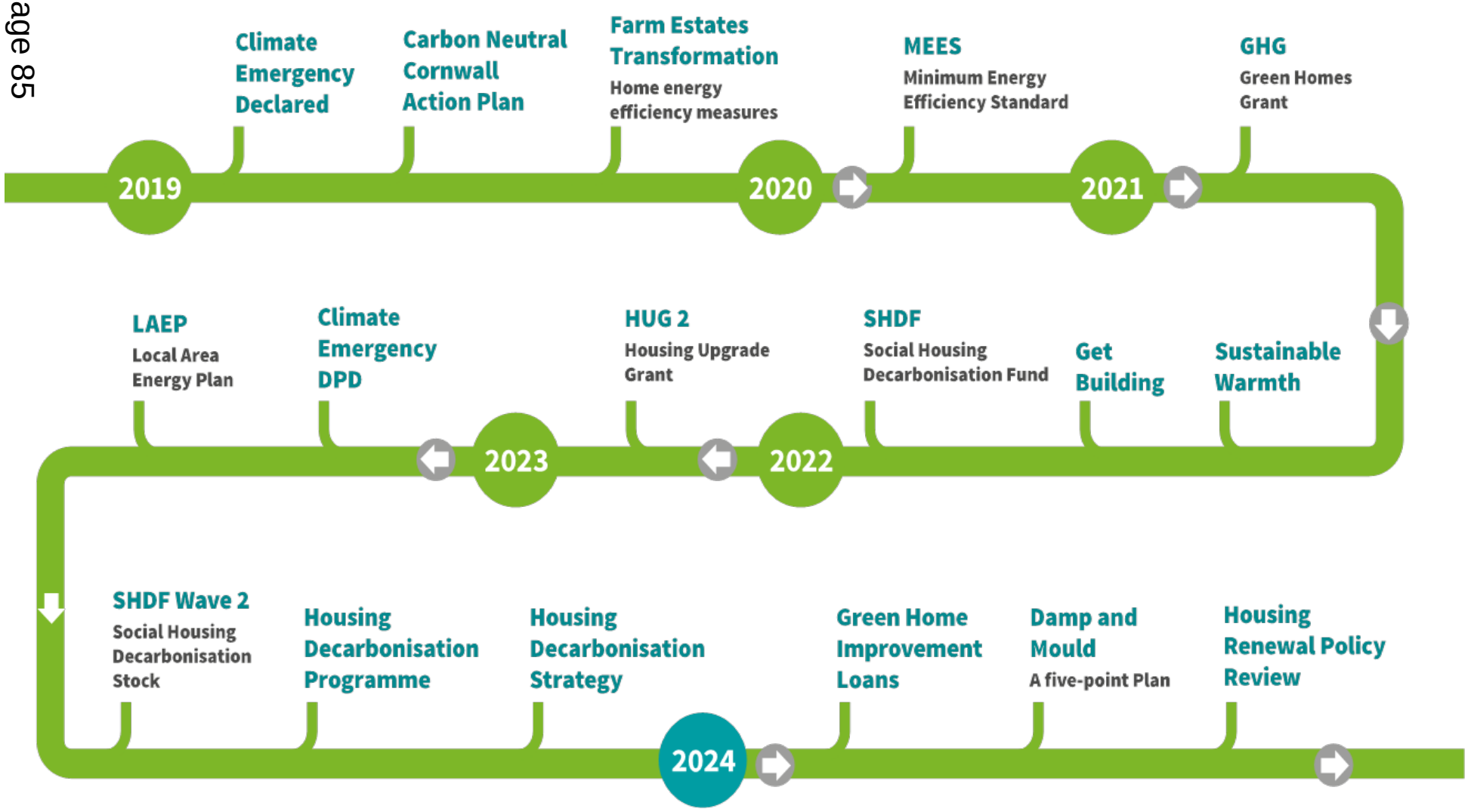
The CloS Good Growth Investment Plan 2022 highlights the challenges Cornwall faces in relation to its housing stock in terms of age, quality and thermal efficiency but a push to accelerate improvements in our housing stock will drive increased investment in our green economy and create new skills and employment opportunities for our residents.

According to data from MCS (Microgeneration Certification Scheme), UK's quality mark for small-scale renewable energy, Cornwall has nearly surpassed 38,000 MCS certified renewable energy installations – more than any other local authority in the UK.

More than 15% of households in Cornwall have an MCS certified renewable energy installation, including solar panels, heat pumps and battery storage.

Cornwall has installed more than 1,800 renewable installations in 2024 so far.

Our journey so far



Decarbonisation of homes in Cornwall has already begun

Partnerships are our greatest strength

Cornwall Council – one and all • onen hag oll

citizens advice Cornwall

ovo energy

Winter Wellbeing

Cornwall Housing

Community Energy Plus

Inclusion Cornwall

Ocean Housing

Coastline housing

..... and many others

1000 homes

£15M of Investment

41 homes in Falmouth – refer to ‘case studies’ for further details

1.0

Introduction

We want our homes to be:

- Kinder to our planet
- Warmer
- Healthier
- Affordable to heat

The background, scope and context for the Housing Decarbonisation Strategy for Cornwall.

This document should be read in conjunction with the Appendices Report which expands on aspects of this main report.

The appendices give additional context on how and why the strategy has been developed and offers greater detail on some of the technologies and measures discussed in the main document.

Introduction

The purpose of this strategy is to consider the practical measures required to reduce emissions from housing in Cornwall and outline key strategic actions the Council can take to accelerate decarbonisation, while reducing energy costs and making homes more healthy places to live.

With around 290,000 existing homes in Cornwall split between different tenures, the scale of the challenge is significant. With a sizeable proportion of homes built prior to insulation and low carbon heating being fitted as standard, the need for retrofit measures to the Cornish housing stock is significant.

Current building standards and the adoption of Cornwall's Climate Emergency DPD sets net zero standards for new build homes within the county and therefore it is the existing stock which this strategy will concentrate on. The condition or the levels of decency within our stock must also be a consideration.

76% of our housing emissions are attributed to heating our homes and our hot water provision and while emissions from fossil fuels are increasing, we need to balance emission reduction with running costs. With fuel poverty and deprivation running at an all-time high across Cornwall, decarbonisation cannot come at any cost.

We feel we have the right balance in Cornwall and have worked hard to establish and maintain our partnerships over time to enable a holistic approach to improvements and hope to build on these principles within this strategy.

Cornwall is already leading the way - 5.6% of Cornish homes are already using heat pumps, compared to 0.9% nationally, with deployment rates increasing.

Cornwall has a much older housing stock than most parts of the country, with 31% of properties built before 1930.

96% of future emissions from housing in Cornwall will come from the existing housing stock that has already been built.

49% of Cornwall's homes are heated by mains gas, far less than the 74% across England and Wales. Fossil fuels such as oil and LPG are used in 20% of homes with the balance (32%) provided mostly through forms of direct electrical heating.

51% of roofs in Cornish homes need more insulation compared to 38% nationally.

43,500 homes (16%) are at least partially single glazed, with 15,500 (6%) fully single glazed. 90,000 (33%) homes have older double or single glazing with a further 72,000 (26%) having double glazing of an unknown age.

The cost to move to low carbon heating is estimated to be £2.4-3.1 bn as a minimum first step (£3-10k per property). £8.4 - 9.1bn should be invested for all homes to be well insulated with (£26-29k per property) by 2050.

Around 14% of households in Cornwall live in fuel poverty, according the Government's most recent reports. Fuel poverty is a significant driver of health inequalities.

25% of all dwellings are estimated to be in severe disrepair.

12,000 homes are estimated to suffer with damp and mould.

Housing is a determining factor for health, education and employment.

Housing tenure is split with 13% social rent, 20% private rent or rent free and 67% owned outright or with a mortgage or loan.

Baseline

Evidence base: building on previous studies

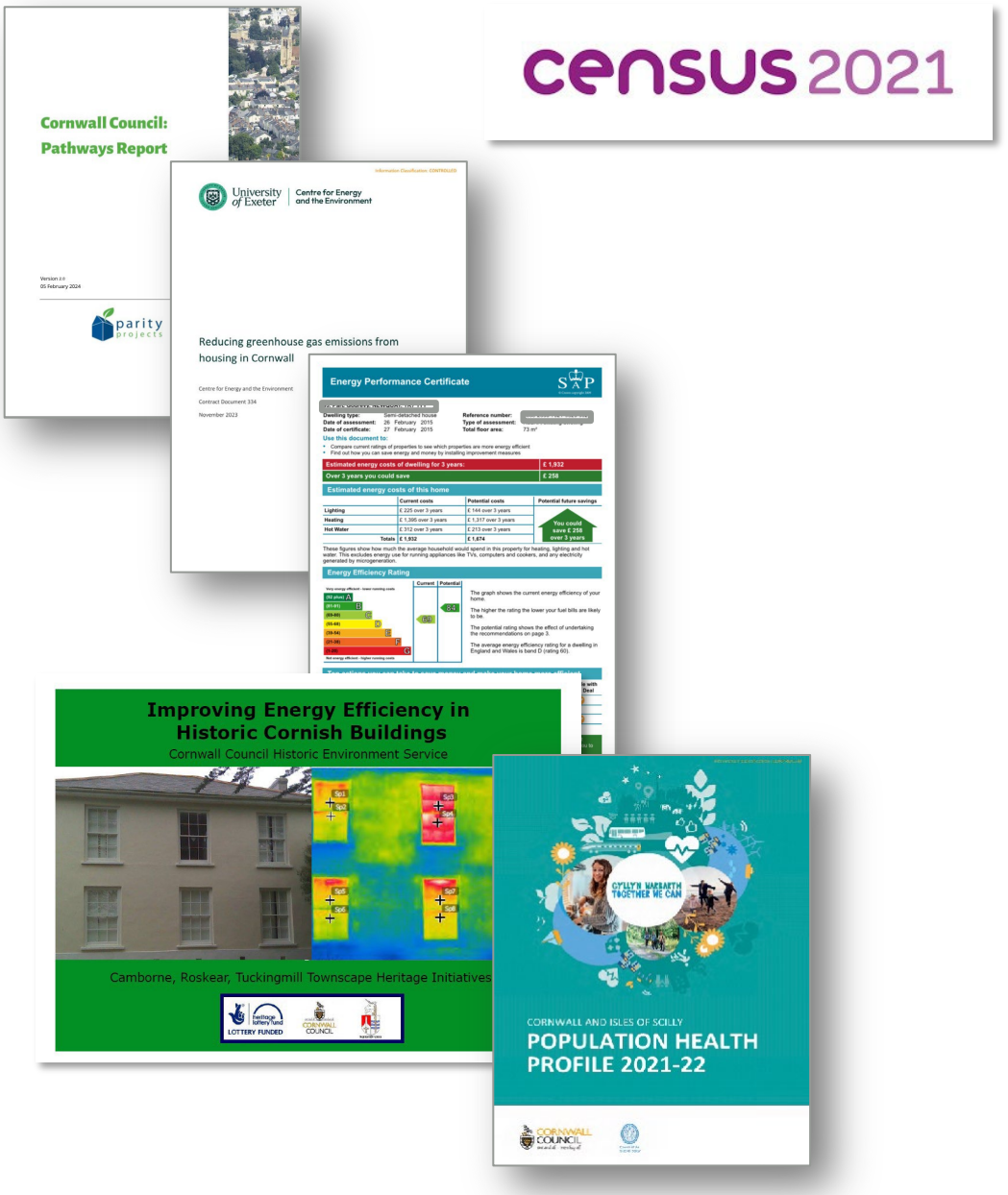
The University of Exeter were commissioned to explore ways to reduce greenhouse gas emissions from existing housing, which represents around 21% of emissions in Cornwall. Their report presents a high-level approach to reducing emissions and quantifies expected emission reductions against the UK's legal carbon budgets.

Parity Projects were also commissioned to model the baseline characteristics for Cornwall's housing stock as well as results of investment scenarios designed to achieve EPC C and to aim for more comprehensive retrofit scenarios. Key insights, from these reports, key datasets and our own analysis used to prepare this strategy are illustrated to the right.

EPC data has also been used as a baseline for this report and the modelling within it. An Energy Performance Certificate (EPC) contains information about a property's energy use and typical energy costs with recommendations about how to improve energy efficiency. The data can be downloaded in bulk format and although we believe this information has limitations in planning for decarbonisation it does contain valuable insights into our building characteristics at an address level.

The population health profiles for Cornwall were also considered to ensure we understood the correlation between housing and health and the links to home retrofit.

Tenure is also a key consideration for acceleration with different opportunities and challenges present. The Private Rented Sector (PRS) in particular faces some key challenges and barriers leading to inequalities for private tenants and the pathways to reducing emissions.



Global, national and local context

Global carbon budgets

A carbon budget is the total amount of carbon dioxide that can be released into the atmosphere before a specific degree of global warming is expected to occur. Use of carbon budgets is vital to ensure that cumulative emissions remain within required limits. The Intergovernmental Panel on Climate Change (IPCC) have estimated global carbon budgets required to limit warming to well below 2˚C while pursuing efforts to limit warming to 1.5˚C above pre-industrial levels, in line with the Paris Agreement.

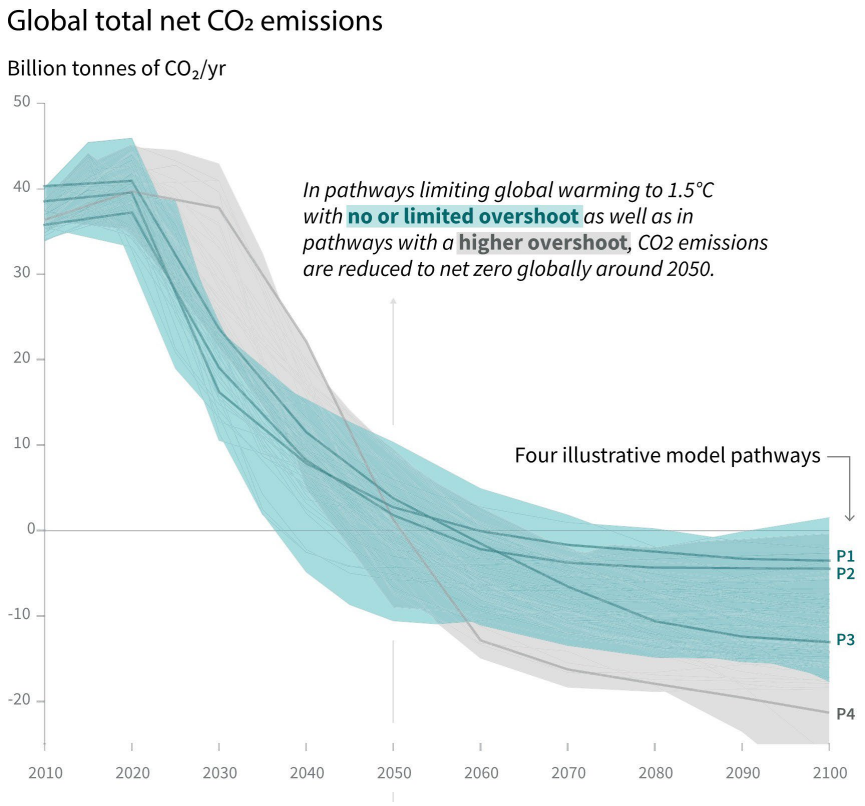
Implications for emission reductions

The latest evidence on carbon budgets from Lamboll et al indicated a remaining global budget of 250 $GtCO_2$ at the start of 2023 for a 50% chance of limiting warming to 1.5˚C. If global emission rates continue at the present rate, the carbon budget will be consumed by the end of 2028. For the carbon budget to last until 2050, it is likely that emission reductions of at least 58% need to occur by 2030.

National and local context

Translating international carbon budgets into national and regional budgets introduces complexities around emissions accounting, which are explained in more detail in Appendix 1. In summary, the UK's national carbon budgets do not appear to be sufficiently ambitious to align with a global 1.5˚C emission reduction pathway.

Local policy is more ambitious than the IPCC pathways, with Cornwall Council declaring a climate emergency in 2019 and aiming for carbon neutrality by 2030. However, given the lack of progress made to date in decarbonising housing, and the limited time remaining until 2030, this would now be very difficult to deliver. This strategy therefore proposes adopting a target based on the IPCC's carbon budgets, which indicate that emissions should reduce around 58% below 2010 levels by 2030.



The IPCC modelled four emission reduction pathways in their report on impacts of 1.5˚C of global warming. Only one of these, P1, appears practical given current limitations in negative emission technologies. The P1 pathway required a 58% reduction in emissions from 2010 to 2030, however due to lack of progress in reducing emissions since this report was published, an even greater emission reduction by 2030 is now required. © IPCC

How to address the key challenges

The Housing Decarbonisation Strategy for Cornwall will only be able to succeed if we are able to meet a number of key challenges. This report is structured to respond to these concerns, aiming to avoid costly mistakes or increased living costs by continually evaluating results.

Technical

Every home presents a different set of issues. The possible solutions can be confusing, and the relative benefits and risks are generally not well understood by the general public. This document seeks to clarify the key technologies and how they go together, presenting decarbonisation approaches for different buildings, recommending simple metrics and appropriate targets that align with scheduled home maintenance work.

Costs and funding

A full retrofit is not always affordable in a single phase, this strategy gives clear recommendations for prioritisation of retrofit steps and expected costs for an example of a simple home. Measures for reduction in energy costs are described, funding streams identified, and social value indicated.

Supply chain

Training and upskilling is needed to deliver the number of low carbon retrofits required, and a good quality assurance process must ensure that installations work effectively. Clarifying and supporting the case for investment is a key part of the challenge and example delivery models show how these can be managed. Developments in the electricity grid will also need to be aligned.

Raising awareness

Ensuring accurate information is available and tackling myths, making sure the policy landscape supports the retrofit measures that need to be undertaken, and making the retrofit journey manageable.

2.0 Technical

- Heating, building fabric and solar PV explained
- Minimising risk with whole house retrofit planning
- Decarbonisation approaches for different homes
- A clear approach to metrics and appropriate targets

3.0 Costs and funding

- Example costs for a simple home
- Energy costs for residents and how to increase affordability
- Funding streams that are currently available
- Social value – …

5.0 Raising awareness

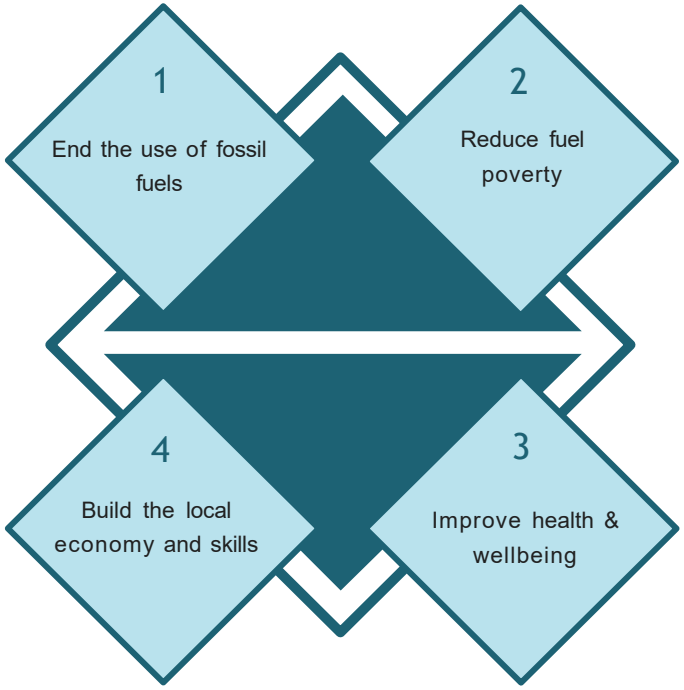
- Ensuring people know how to decarbonise their homes
- Understanding public opinion and tacking misinformation
- Ensuring policy encourages and doesn't inhibit retrofit
- Make the journey as easy as possible for people

4.0 Supply chain

- The importance of training and upskilling
- Quality assurance processes
- Creating a supportive environment for investment
- Example delivery models
- Grid investment

Priorities

Cornwall's housing decarbonisation strategy has been developed to meet the key objective of decarbonisation. The strategy should enable Cornwall to make a proportional contribution toward reducing emissions within a 1.5˚C carbon budget. In practice this means aiming for a 58% reduction in emissions below 2010 levels by 2030. The strategy's approach to decarbonisation also aims to deliver co-benefits to Cornwall.



Four strategy principles

1. End the use of fossil fuels – the strategy should aim to replace oil and gas heating in at least 55% of homes by 2030. Decarbonising heat is the most significant change that can be made to rapidly reduce carbon emissions. Much of this can be achieved by replacing end of life boilers with heat pumps in heat pump ready homes.

2. Reduce fuel poverty – the amount of energy used in homes should be reduced where there are cost-effective opportunities, to reduce residents' energy bills as far as is practical. There should be a specific focus on those in, or at risk of being in, fuel poverty, to ensure that decarbonisation also delivers savings on residents' energy bills. Renewable energy generation and energy tariffs also play a role in addressing fuel poverty. Care must be taken to ensure that decarbonisation measures do not increase or worsen fuel poverty.

3. Improve health & wellbeing – homes should become healthier and more comfortable places to live as they decarbonise. Our homes are at the core of physical and mental wellbeing and should be places for people to thrive. Improving housing quality through retrofit plays an important part in tackling health inequalities. Retrofitting must also be responsible, and not create unintended consequences which may impact health.

4. Build the local economy and skills – create jobs and a stable marketplace and support training in the county to upskill the workforce to deliver the decarbonisation objectives. Better skilled installers will deliver more effective decarbonisation and reduce the risk of poor outcomes. A greater number of qualified installers will support the market to limit cost increases caused by supply chain constraints.

Optimised retrofit principles

Optimising retrofit for a whole stock approach

In this strategy we consider all housing across the county. Most new builds should not require fabric retrofit but may need a low carbon heating system. However, we must consider all homes, many of which have not been built to net zero standards. The key principles of optimised retrofit to achieve a cost and carbon optimal approach are outlined in this strategy, and focus on achieving the fastest emissions reductions possible, while remaining affordable and ensuring value for money.

For most homes, this will mean:

- ❑ Prioritising replacement of carbon-based heating systems (generally with heat pumps).
- ❑ Reduce heat loss by targeted fabric retrofit, where cost effective (easy wins) or replacement is necessary anyway. Plus, airtightness & heat recovery for ventilation and wastewater.
- ❑ Installing renewable energy, and/or ensuring residents have access to cheap electricity.

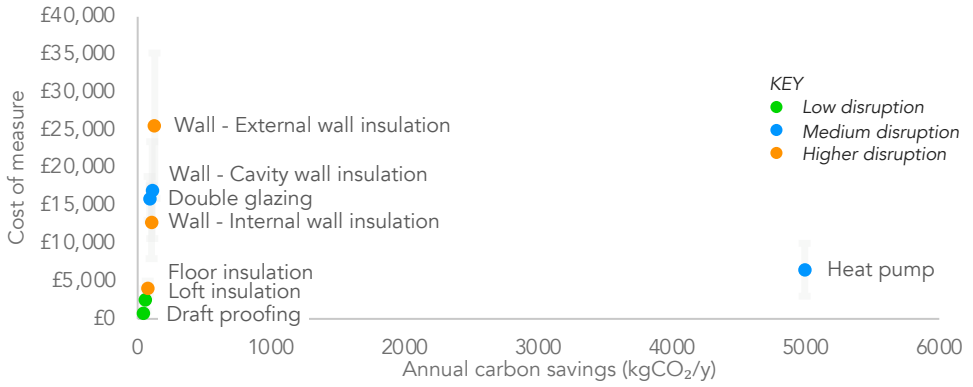
The cost of these measures can vary significantly, as can the carbon and cost savings they provide. Sequencing these measures in the correct order will save money on upfront costs, routine maintenance, achieve better value for money and enable emissions to be cut faster than the traditional fabric first approach.

Insulating homes can save energy, make homes healthier and more comfortable, but work to fully insulate homes is not always cost effective, it can be very disruptive and often creates a barrier to the transition to a low carbon heating system, when it is not essential in many homes. Some insulation measures, such as draught proofing, loft and cavity wall insulation tend to have lower costs and offer excellent value for money. Other measures, especially solid wall insulation, are often more expensive and do not always justify their cost.

P28 shows the breakdown of the housing stock in Cornwall in relation to this approach and the works required to each home before a transition is possible.

While insulation plays an important role in reducing heat demand, heat pump efficiency can be largely driven by a well-designed heating system, with correctly-sized heat emitters which enable a lower flow temperatures. Electricity to gas price ratios are shifting and have fallen in recent years, balancing further the running costs on the transition to low carbon. In 2016 Government committed to rebalancing the electricity to gas ratio through the Climate Change Levy (CCL) which continues to rebalance the costs on an annual basis.

We do acknowledge that one size will not fit all when it comes to retrofit and individual bespoke plans will be required on a property-by-property basis to identify the best pathway for each house and each occupant. Affordability will vary between our residents as will the impacts of the condition of our homes and the cost-of-living crisis. Adopting a holistic approach will improve access to safe, warm and secure homes across all tenures. P47/48 showcases the comprehensive work the Council and its partners are already doing to ensure no one is left behind and our work to decarbonise is always focused on identifying those in greatest need and providing the right support. The overarching ambition is for every home in Cornwall to able to transition to a low carbon heating system with sufficient insulation to make it affordable to heat to a healthy standard.



Installing a heat pump in the first step of a retrofit delivers large reductions in emissions, making subsequent emission reductions from fabric improvements relatively small. Upgrading the fabric over time is still important to improve health and comfort, reduce operating costs, and mitigate demand on the electricity grid.

An inclusive strategy: creating the right balance

A balanced strategy must consider all our homes and all residents and for many a fully fabric first approach is not always achievable or affordable. In many homes the insulation levels are already sufficient to enable a transition to low carbon heating and this should be supported where possible. However for others improvements to the fabric may well be the best approach or what a resident want to focus on first as in some cases some measures like better doors and windows will make homes more liveable.

The modelling on P29 shows that there are approximately 57,000 properties in Cornwall which are ready to make the transition with no fabric upgrades required. The reason being, while many house builders have installed low carbon heating systems and solar panels in recent years, this hasn't been a requirement until the implementation of Cornwall's Climate DPD policies in 2023. Policy SEC1 now requires that all new homes are built to a mandatory net zero build standard, where energy generation is balanced with energy use. Cornwall Council took this important step to go beyond the standard policies for new build to minimise creating "the retrofit of the future"

In contrast insulation requirements have been well established by Building Regulations providing for high levels of insulation and thermal efficiency since the late 1990's. This presents an opportunity to decarbonise quickly in properties built over the last 30 years where insulation and condition are likely to be good, and an adequate electrical supply is available. These homes are classed as heat pump ready and can quickly transition at a reasonable cost. Combined with excellent design, installation, energy generation capacity and optimised tariff advice these properties could see running costs drop below those of a gas or oil boiler.

Our stock also contains a proportion of properties which require basic improvements to insulation and ventilation, where fitting solar panels often also make sense as early interventions alongside low carbon heating. Additional measures to further reduce the heat loss of the building can be done as parts of the building are naturally upgraded and replaced .

So, while it is important to tackle our older hard-to-treat properties it is as equally as important to consider our quick wins and focus some attention on these. These homes could equally be occupied by households in fuel poverty who could benefit from retrofit measures and tariff advice. An inclusive strategy for all house types and occupiers is essential to drive our ambitions.

The case studies developed alongside the strategy showcase a wide range of homes and residents with different solutions deployed but all with the same aims to reduce emissions and running costs.

Clockwise from top left: MVHR in a 1990s bungalow, air to air heat pump in a 1950s semi-detached bungalow, PV on a 1990s house, new windows in a Victorian cottage.

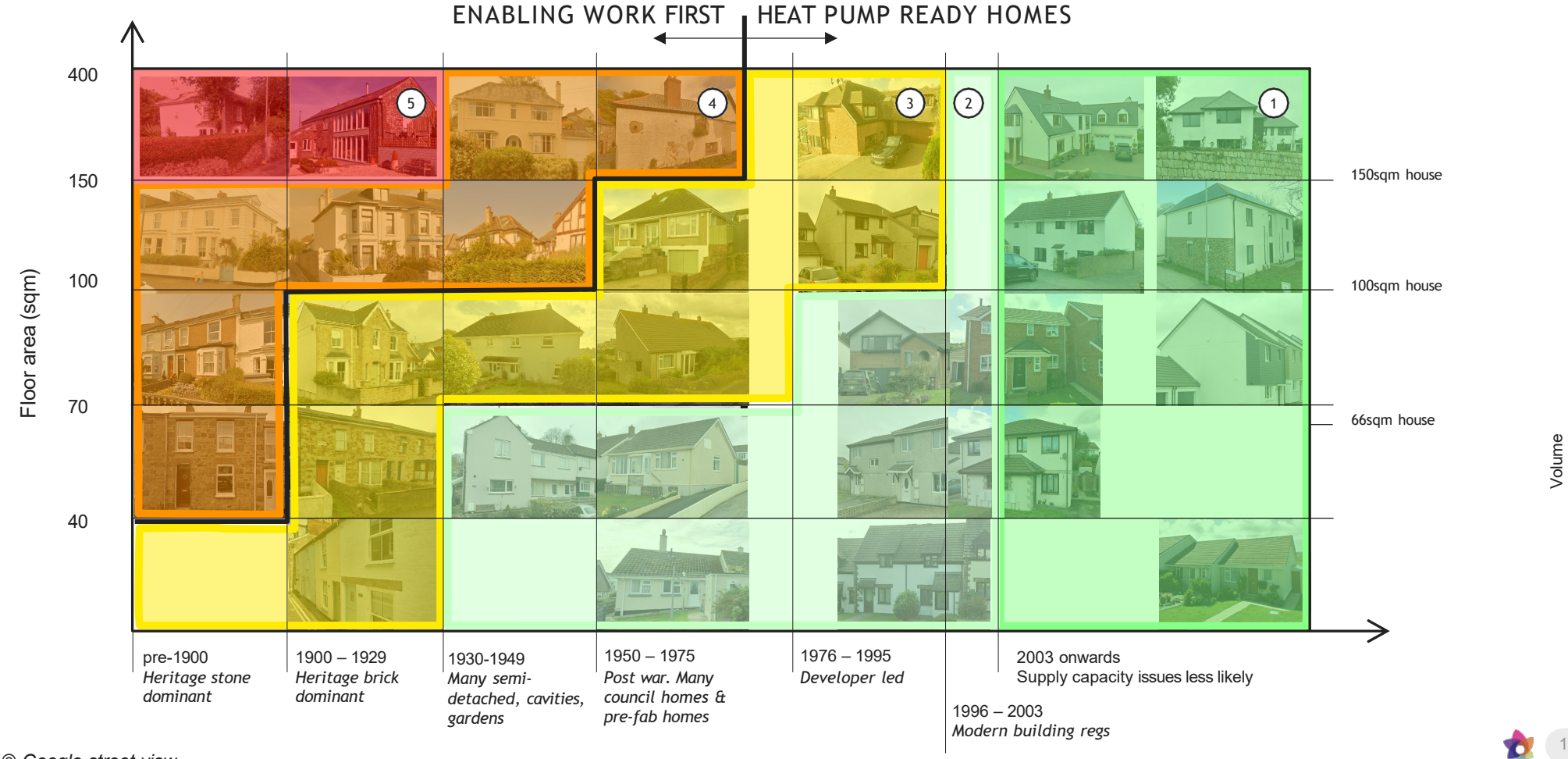
Different homes need different decarbonisation approaches

Assessing how easily a heat pump could be installed in Cornish homes

It is possible to assess the likely standard of insulation to walls and floors of homes based on when they were built. Significant changes to construction occurred around 1930, when cavity wall construction was used more consistently, and in 1996 which is when modern building regulations were introduced, with better fabric requirements.

The second key indicator for which homes could have a heat pump fitted quickly is the internal floor area, which is recorded in the EPC data. Smaller homes will generally need less heat so are more likely to be able to have a heat pump on a standard electrical supply. We have also observed that smaller and newer homes usually have simpler shapes, especially simpler roof shapes, which will also help to make them more energy efficient.

The diagrams below show example properties of different ages and sizes. The properties to the left are the oldest and properties at the bottom are the smallest.



Images © Google street view

The evidence

A growing evidence base

An increasing number of studies support this approach to decarbonisation, including DESNZ's Cost-Optimal Domestic Electrification study, Nesta's report on Insulation Impact, a Buildings & Cities paper on the 'Fabric First' approach, a Passivhaus Trust paper on staged retrofit, and recent articles by CIBSE and others.

The Energy Systems Catapult Electrification of Heat Project, involved around 740 heat pumps installed in a representative and broad range of house types. The project demonstrated that decarbonised electricity offers very low or even zero-carbon heating for homes, without necessarily carrying out extensive deep retrofit work, evidencing that it is technically possible to install heat pumps in the vast majority of house types in the UK with no threat to comfort or running costs. Its findings also establish that heat pumps typically have a Seasonal Coefficient of Performance (SCoP) of 2.9.

In these studies, cost calculations generally use the standard energy tariff set by the Energy Regulator for Great Britain's price cap in their calculations. Further cost reductions are possible using a combination of on-site solar generation and the new breed of energy tariffs designed specifically for heat pumps.

The Regulatory Assistance Project (RAP) also regularly analyses the running costs of heat pumps versus gas boilers and explains that heat pumps have similar running costs to a gas boiler, even though electricity is more expensive than gas, because they produce heat at a more efficient rate. On average heat pumps turn one unit of electricity into 2.5 to 5 units of heat, meaning they use about three to five times less energy compared with gas boilers (For further details on potential running cost savings see p35).

Several reports over the past few years have considered the optimal approach to decarbonising buildings, and concluded that heat decarbonisation should generally be prioritised, with other measures introduced more gradually over time.

Other heat decarbonisation led strategies

The approach of this Housing Decarbonisation Strategy, to prioritise low carbon heating systems rather than a simple 'fabric first' principle, is in line with other organisations in the construction industry. But acknowledges that this will not always be the best course of action, so each building and its inhabitants must be considered so that no one is left behind.

AECB Step-by-step retrofit

The Association for Environment Conscious Building's (AECB's) CarbonLite Step-by-Step Retrofit programme has now endorsed this approach, with decarbonisation of heating in the first phase – Step 1 - of retrofit work.

The AECB describes the Step 1 retrofit standard as a 'heat pump retrofit' standard as it has been designed for a lighter fabric retrofit, effective ventilation and a heat pump.

The Passivhaus Trust paper – 'The right time for heat pumps'

Passivhaus and EnerPHit (the Passivhaus retrofit standard) are fabric led standards. The Passivhaus Trust has issued a guidance paper (April 2024) recommending a similar strategy to the AECB, starting with a plan for the whole process but introducing the heat pump at an early step, with minimal fabric improvements needed initially for many homes.

Superhomes one stop shop

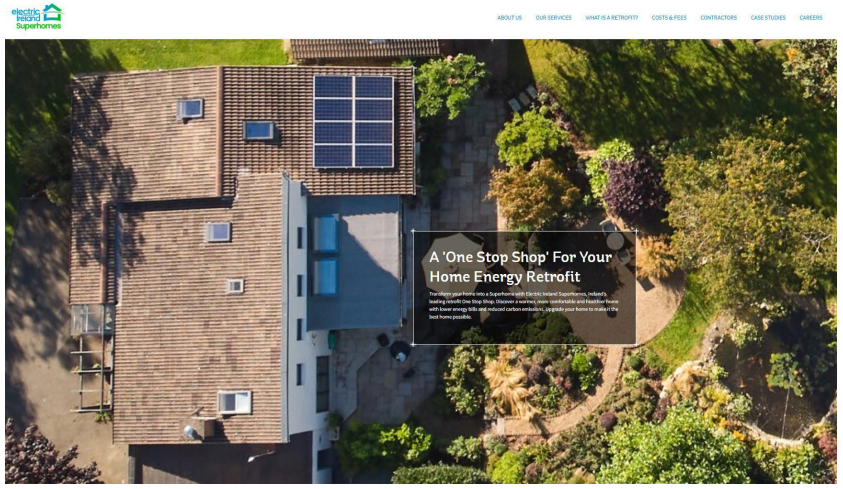
Electric Ireland Superhomes was established in 2021 with the aim of dramatically upscaling home retrofit and supporting Ireland's climate action targets through a commitment to delivering over 30,000 home retrofits by 2030.

They offer a set menu of services including heat pump+, whole house retrofit, and retrofit for groups of multiple properties. Their service includes design, advice and support to access funding, and recommended installers. The heat pump+ service for newer homes involves the installation of a heat pump heating system, combined with basic insulation measures and solar PV.

Headline certification criteria - *updated Sept 2023*

Criteria	Carbonlite Retrofit Step-by-step	Carbonlite Retrofit	Carbonlite New Build
Delivered space heating and cooling (kWh/m2/a)	report result	≤ 50 kWh/m².a (≤ 100 kWh/m².a with certifier-approved exemption)	≤ 40 kWh/m².a
EITHER Primary Energy (PE, varies) **OR** Renewable (PER) (kWh/m2/anum)	report result report result	report result report result	≤ 85 kWh/m².a ≤ 75 kWh/m².a
Ensure ventilation	Continuous MEV or MVHR must be installed : follow PAS 2035 Annexe C or as required by Part F of the Building Regulations.		
Airtightness (q50)	≤5.0 m³/m².h	≤2.0 m³/m².h	≤ 1.5 m³/m².h
Thermal Bridges	N/A. If some additional & significant fabric measures are being replaced or installed, certifiers will advise whether full Retrofit Standard requirements are applicable.	Assumed to be less than 0.01 W/mK, else accounted for in PHPP or for retrofits a default heat loss factor may be used.	Assumed to be less than 0.01 W/mK, else accounted for in PHPP
Surface Condensation (fRsi) assessed		fRsi to meet criteria in PHPP, or 0.75 (as Building Regulations/ PAS2035), or local standards - whichever is more onerous.	fRsi to meet criteria in PHPP, or 0.75 (as Building Regulations/ PAS2035), or local standards - whichever is more onerous.
Heating System	Change existing fossil fuel (or direct electric) heating system to a heat pump.	Existing heating systems may be retained, but a practical plan to allow for future low carbon heating supply must be in place.	Install a non fossil fuel system or connect to a low carbon district heating network.
Thermal Comfort	PHPP modelled overheating risk, <10% Acceptable (Guidance: <5% Good practice or <3% Best practice)		
Running cost comparison	Must be same/lower running costs than base case **	-	-
Where a heat pump is installed			
Certifiers must liaise with the building owner and the MCS heating system designer in order to ensure that:			
Maximum flow temperature for the designed and installed heating system (space heating only)	no greater than 50°C ; Best Practice - heating system is designed and installed for flow temp <45°C		
Energy Model using PHPP, showing:			
	A. Pre-retrofit Baseline *B. Step 1 achieved* *C. Retrofit scenario showing how Full Retrofit could be achieved (≤ 50 - 100 kWh/m2.a)*	*Retrofit Standard achieved (≤ 50kWh/m².a or ≤100 kWh/m².a with certifier approved exemption)*	*Building Standard achieved*

The AECB have updated their retrofit certification criteria to include a 'step by step' option. Step 1 is the minimum required for certification, based on installing a heat pump with specific system characteristics.



The Superhomes website offers homeowners and landlords in Ireland a simple route to retrofit and heat decarbonisation. https://electricirelandsuperhomes.ie/

2.0

Technical

Target Outcomes
Improved levels of insulation
Good ventilation
Well-designed low carbon heating systems
Renewable energy generation

The technical challenges and solutions associated with low carbon heating, electrical supply capacities, building fabric, and solar photovoltaics.

This section should be read in conjunction with Appendices 2.1 to 2.7

Technical context for Cornwall

Decarbonisation and retrofit of homes is a complex challenge everywhere in the UK, but there are also some specific local challenges, including:

Climate

Although most parts of the county are relatively mild, wind driven rain can present a risk when insulating existing homes, especially the walls. Particular care and expertise is needed to avoid damp.

Radon

Radon is a radioactive gas that occurs naturally in some areas including Cornwall. Improving airtightness of homes is a key part of improving energy efficiency, but this must be done in conjunction with improved ventilation and with particular regard to ensuring radon doesn't accumulate indoors.

Mundic and system builds

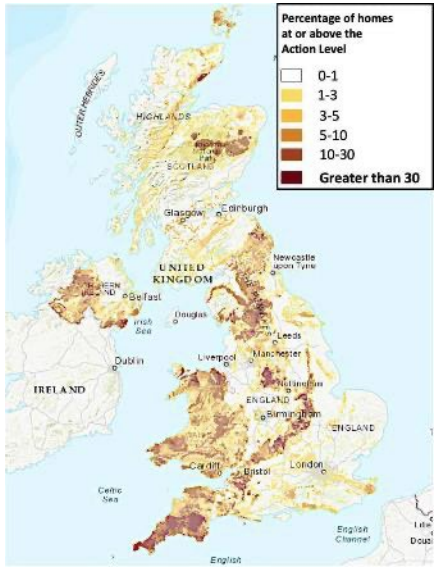
Over the years, different ideas have been put forward to solve Cornwall's perennial housing shortage. These have included novel construction materials and methods intended to make housing cheaper to build. Many of these methods relied on a shorter building life as a means to reduce costs, using less durable, lower cost materials such as reinforced concreted and mundic. Retrofit of these homes can be particularly challenging and potentially costly, so they need a specific strategy to ensure the most cost-effective approach.

Heritage and traditionally built homes

Cornwall has an older overall housing stock than the rest of the UK. These older properties and communities need to be protected while ensuring the residents are able to make the changes needed to improve the energy efficiency of their homes. Retrofitting should be carried out sensitively to ensure character is retained.

Cornwall's particular risks

Relatively old housing stock
(image source: Prime Location)



Radon
(image source: UKHSA)

Mundic
(image source: rics.org)

Driving rain (image source:
Ivan_L from Freerange Stock)

Low carbon heating

Most domestic emissions are from heating

Heating with oil or gas boilers is responsible for most carbon emissions from homes. The phase-out of fossil fuels for heating is therefore the single most important measure to decarbonise homes.

Heat pumps are expected to be the main technical solution

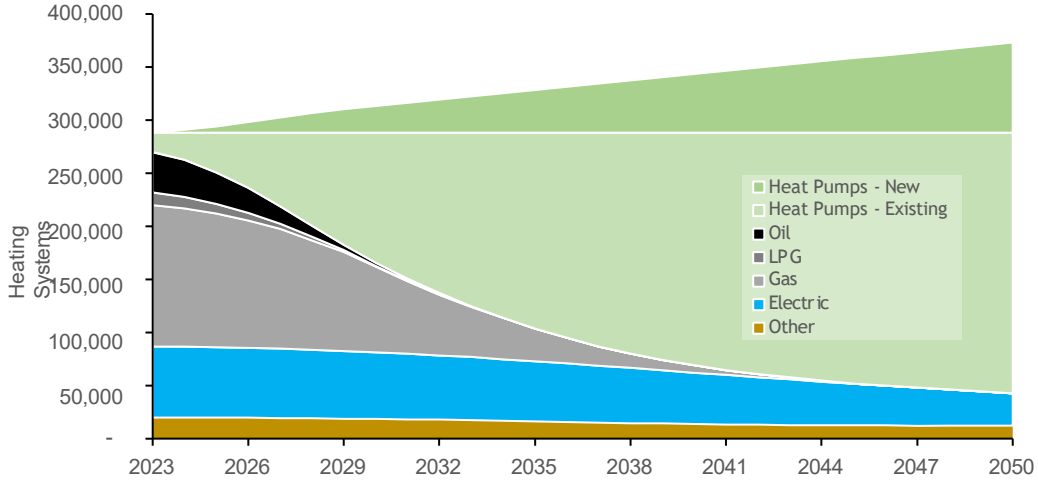
The carbon emissions per kilowatt hour of electricity in 2023 were 30% lower than gas and over 50% lower than oil. By 2030 they will be 75% lower than gas and 83% lower than oil, and by 2050 close to 100%. This means the main pathway for decarbonising homes is to replace fossil fuel heating systems with electric heating systems.

As the direct use of electricity for heating is generally expensive, the majority of electrification is expected to occur via air or ground source heat pumps. These come in different configurations, but all types typically use 60-80% less electricity than direct electric heating, resulting in emission reductions of 80-90% relative to fossil fuels, and competitive operating costs. The technology is also commercially available, mature, and scalable.

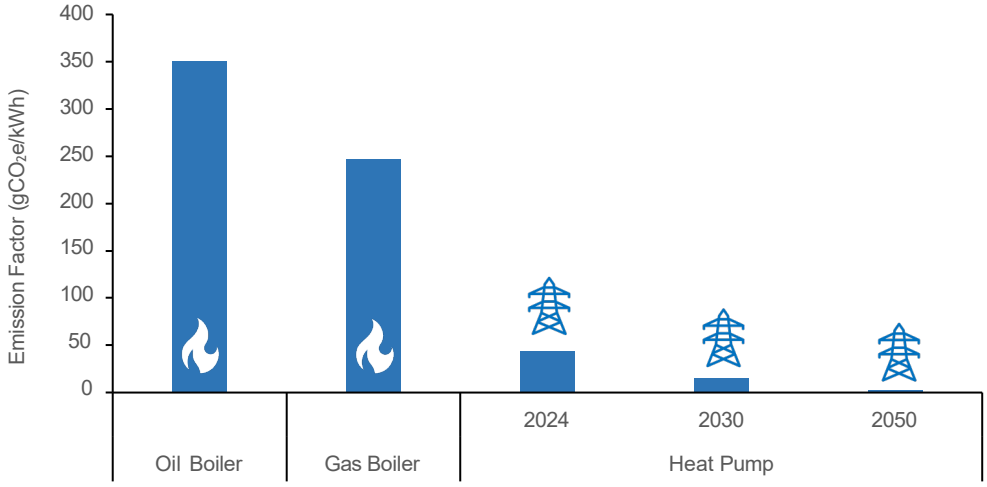
Other heating technologies,fuels & future innovations

- Electric storage heaters may be suitable in some homes.
- Geothermal heating may be suitable for some homes, however costs are not yet known. Trials are in progress so its potential is expected to become clearer over time.
- Woody biomass, liquid biofuels such as Hydrotreated Vegetable Oil, and biogas are not expected to be scalable and do not significantly improve combustion related air quality issues.
- Hydrogen has issues with cost, efficiency, scalability, carbon dioxide emissions, air quality, and safety. Sufficient quantities of genuinely low carbon hydrogen are highly unlikely to be available.
- Energy from Waste is not considered a low carbon energy source.

For further information see Appendix 2.1 Heat Sources



Number of heating systems in Cornwall by system type required to deliver 58% emissions reduction by 2030. Replacement of fossil fuel heating with various forms of heat pump forms the core strategy to reduce emissions.



Carbon emission factor comparison per unit of heat energy delivered by fossil fuel boilers versus air or ground source heat pumps. Emissions from heat pumps will fall even lower as the grid decarbonizes, and also where on-site solar generation is present.

Myths about heat pumps

Understanding what is possible

As with many unfamiliar technologies, it is normal for myths to circulate. Heat pumps are no different, and because of their sensitivity to poor design and installation practices there are, unfortunately, case studies of systems that are not performing as well as they should be. Given the importance of heat pumps to Cornwall's decarbonisation strategy, some of the more common myths have been summarised below:

1. Heat pumps are not suitable for most dwellings (FALSE)
   The Energy Systems Catapult led Electrification of Heat project was able to successfully install heat pumps in a wide variety of building types across the UK. Our analysis of Cornwall's housing stock indicates that the majority of homes should be suitable.
2. Heat pumps 'don't work' in poorly insulated buildings (FALSE)
   Heat pumps can efficiently move heat into any building, regardless of how well insulated it is. In poorly insulated buildings a larger heat pump will be required, together with larger heat emitters to ensure it can operate efficiently.
3. Heat pumps cost £10k+ to install (PARTIALLY FALSE)
   The cheapest type of heat pump is usually an air-air unit, more generally known as mini-split air conditioners. These often cost less to install than a gas or oil boiler.
4. Heat pumps are more expensive to run than oil or gas boiler(sFALSE)
   Properly installed heat pumps offer similar running costs to oil or gas boilers, based on Q1 2024 price cap rates for fixed tariffs. Combining heat pumps with time of use electricity tariffs can reduce costs by 40-50% compared to a boiler, while the addition of solar photovoltaics can take bills down to zero, and beyond.
5. Heat pumps don't work when it's cold (FALSE)
   Heat pumps are the most common heating system in some of the coldest countries in Europe.

Trelissick House in Cornwall is a grade II listed mansion that was built in 1755 and is representative of what many people would consider a building that is 'impossible' to heat via heat pumps. It was fitted with 165kW of locally built ground source heat pumps from Kensa in 2022 as part of the National Trust's mission to become net zero by 2030. (Image source: National Trust)

Where poorly performing heat pump installations are identified, these systems should be checked for deficiencies in their design, installation or operation as the first intervention, these being the 3 critical considerations to achieve optimal outcomes. If deficiencies are identified outside of these 3 checks, then feedback loops with installers, manufacturers and accreditation bodies need be utilised to ensure lessons are learned and enacted for following installations.

In some cases a heat pump may not be the appropriate measure and this strategy reflects the need to consider each property and its inhabitants when finding energy efficient and emission reducing solutions.

The importance of electrical supply capacity

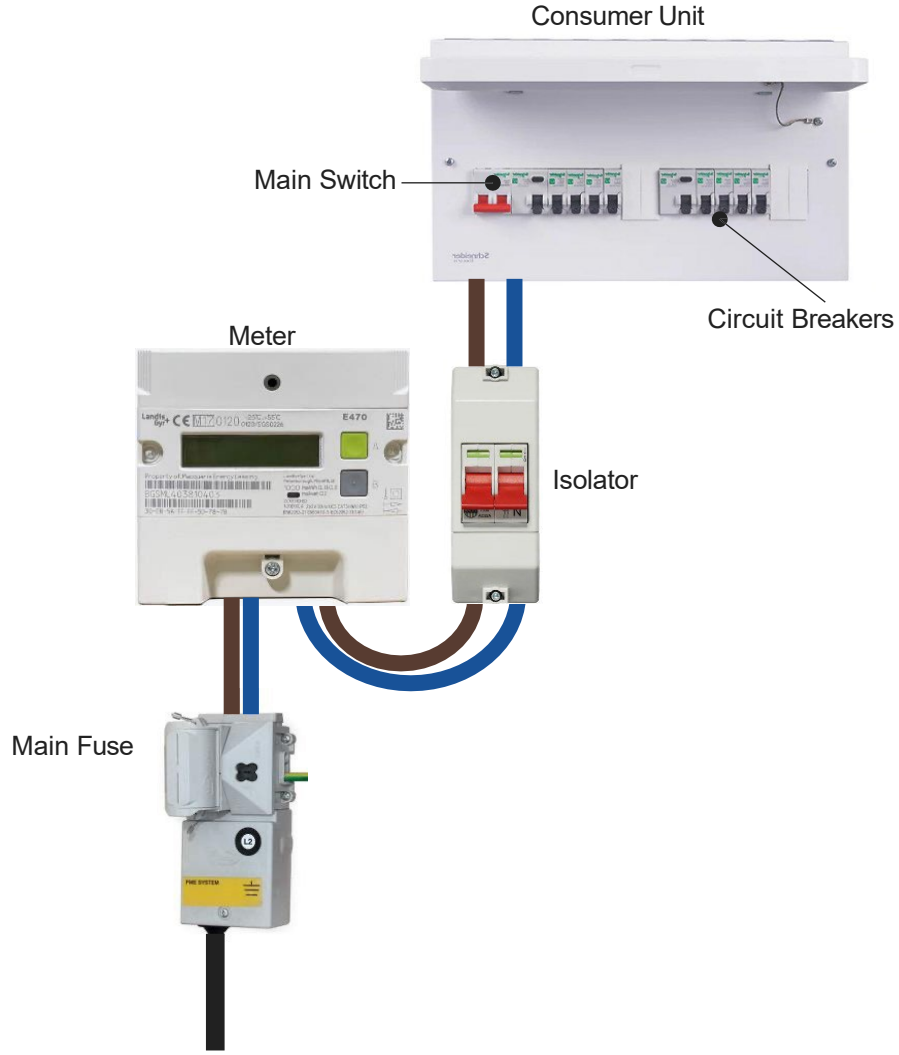
Understanding domestic electrical supplies

Homes must have sufficient electrical supply capacity to meet the power demands of a heat pump. In many cases for smaller and newer homes the supply will already be sufficient, however for older homes the existing supply capacity may need to be upgraded. In the case of larger homes, fabric efficiency measures may also be required for a heat pump's power demand to remain within the available single phase supply capacity. The adjacent diagram shows the main components in a typical modern single phase domestic electrical supply, starting from the incoming electricity supply cables through to the consumer unit, which distributes the electricity to individual circuits within a home.

Who owns what?

The table below summarises who usually owns the main components in a domestic electrical supply. This is important to understand as various parties may need to be involved in upgrading different parts of the electricity supply, some of which may involve lead times of several months.

Distribution Network Operator	Electricity Supplier or Property Owner	Property Owner
Electricity supply cables	Meter	Isolator to consumer unit cables
Main fuse		Consumer unit (including main switch and circuit breakers)
Main fuse to meter cables		
Meter to isolator cables		
Isolator		



Various components of domestic electricity supplies may introduce constraints on heat pump capacity. In some cases these components will need to be identified and upgraded, ideally prior to failure of an existing fossil fuel heating system to allow for emergency replacement with a heat pump. (Image sources from top to bottom: Schneider, Landis+Gyr, Wylex, Lucy Electric)

Fabric and ventilation efficiency – insulation and windows

Good quality building fabric and ventilation is important from an environmental and human perspective. Housing quality is a concern in Cornwall, with many homes in need of repair. Heat pumps will be the most impactful measure in terms of carbon, but improvements to the building fabric will also help to alleviate comfort issues and fuel poverty in situations where residents are currently 'zoning' their heating. In a 'deep retrofit' scenario, some residents will be able to use very little heating. This page introduces fabric measures, and the next page describes airtightness and ventilation measures. Later in the report we describe how these might be prioritised and fit into the decarbonisation pathways.

Heat loss through the building fabric

(see Appendix 2.4 for more detail)

Insulation added to the building fabric prevents heat being lost through walls, floors and roofs. Insulation is best when applied to the outside of a structure, as existing fabric remains warm and protected, however several strategies are possible. The image to the top right shows an example of loft insulation installed in two layers, leaving adequate space for ventilation at the eaves, and wood fibreboard installed on the inside of a solid brick wall.

Windows and doors tend to have a higher thermal conductivity than walls, and upgrading these to high quality double or triple glazing can reduce heating demand and improve thermal comfort. The images to the right show a single glazed window in poor condition compared to a new vacuum double glazed unit and a triple glazed sash window.

Earthwool loft insulation (image source: www.the-salutation.co.uk)

Wood fibre insulation (image source: Prewett bizley Architects)

Windows: poor single glazed, new vacuum double glazed (image source: Prewett bizley Architects), triple glazed casement (image source: www.weare21degrees.co.uk)

Fabric and ventilation efficiency – Ventilation and airtightness

Heat loss through air movement

(See appendix 2.5 for more information)

Reducing heat loss through air movement is achieved by stopping accidental air leakages and adding the right amount of ventilation in a controlled way while recovering the heat from the expelled air where possible.

Airtightness measures help to reduce infiltration (unwanted ventilation), which improves comfort levels and energy use. Filling visible gaps and using well fitted windows and doors, gives a reasonable improvement in airtightness. This can be taken further by using specialist air tightness tapes, windows with better quality seals, and stripping back finishes to the basic structure and repairing and taping junctions. For example, joist ends as shown in the images to the top right. Removing chimneys will also help to improve the airtightness of the external envelope.

Ventilation needs to be provided mechanically in a building with low air leakage. This is important for resident health, especially given the high levels of radon in some parts of Cornwall. It is possible to recover a high proportion of the heat using mechanical ventilation with heat recovery systems (MVHR) and these can be commissioned to ensure a positive pressure in areas of high radon.

The image to the bottom right shows a ceiling mounted MVHR concealed in a kitchen bulkhead in a flat. With careful planning, these can be integrated into living spaces in an unobtrusive and practical way. Ideally the external supply and exhaust ducts should be close to an external wall or roof, to minimise the duct lengths. This helps to increase the overall system efficiency of the heat recovery and mean less heat is lost to the outside.

Stripping back to the structure (Image source: Eightpans) and applying airtightness tape to joist ends (Image source: Ecomerchant) will deliver best practice levels of airtightness.

An MVHR system recovers heat from the air leaving the building and transfers it to the fresh air entering the building. This exchange heat happens without the two air streams mixing.

Fabric and ventilation efficiency – Strategies to avoid overheating

An increasing health issue

Mitigation of the risk of overheating in homes is becoming a more significant concern as climate change is affecting summer temperatures and dangerous heatwaves become more common. In new homes there is now a Building Regulations requirement to assess and take steps to avoid overheating, but in existing homes there is no obligation to do so as part of a refurbishment or retrofit (except to meet PAS2035 standard). It is generally the case that retrofit doesn't increase the risk of overheating, but in homes that already overheat, there is an opportunity to consider potential measures to reduce the risk as part of a retrofit project.

The Good Homes Alliance have created an assessment tool for existing homes to identify key contributors to overheating risks at early stages of retrofit projects.

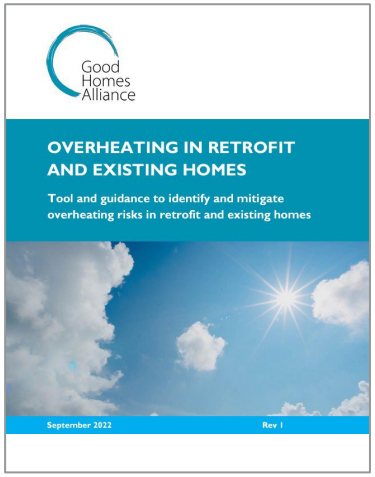
Mitigation strategies

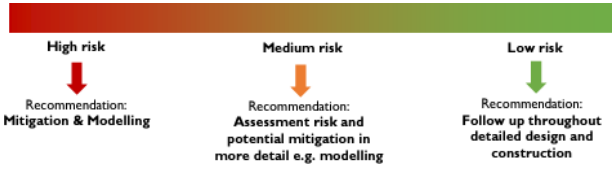
South and west elevations are likely to be at most risk of extensive solar gain. East facing windows would also experience similar issues especially as midday sun approaches.

Mechanical cooling should not be relied on as the primary mitigation for overheating as those least able to cope with physical effects of overheating – the very young, very old and those with restricted movement – are also those least likely to be able to afford the energy costs of cooling.

Introducing shading, such as awnings or shutters, and ensuring effective ventilation as well as insulation, particularly to roofs, are the primary strategies. (Note that air-to-air heat pumps can usually operate in reverse as cooling as a secondary strategy where these are used for heating.)

See appendix 2.5 Managing Risk for more infomation





The good homes alliance tool for assessing the risk of overheating can be used to determine the broad category that homes fall into, and the accompanying guidance provides information on the best approaches to reduce the risks. The guidance also sets out how to carry out a more detailed assessment of the risk as the design is developed.

Mitigation strategy		
Shading	External shutters (image source: Contrasol)	
	Internal blinds/curtains (image source: English blinds)	
Passive ventilation	Fully openable windows (image source: Velfac)	
	Ceiling fans (image source: RS Components)	
Active ventilation	MVHR with summer bypass	
	MVHR with 1.5 kW cooling coil (image source: Zehnder)	
	Full cooling	

Potential mitigation strategies to reduce the risk of overheating in homes.

Solar photovoltaics

The vital role of solar photovoltaics

Nationally, the Climate Change Committee's Balanced Net Zero Pathway indicates solar capacity needs to increase from around 17GW at present to 85GW by 2050. This is a similar amount to the National Grid's most plausible net zero aligned Future Energy Scenarios. This represents the addition of around 114 million 600 W commercial panels or around 170 million 400 W residential panels.

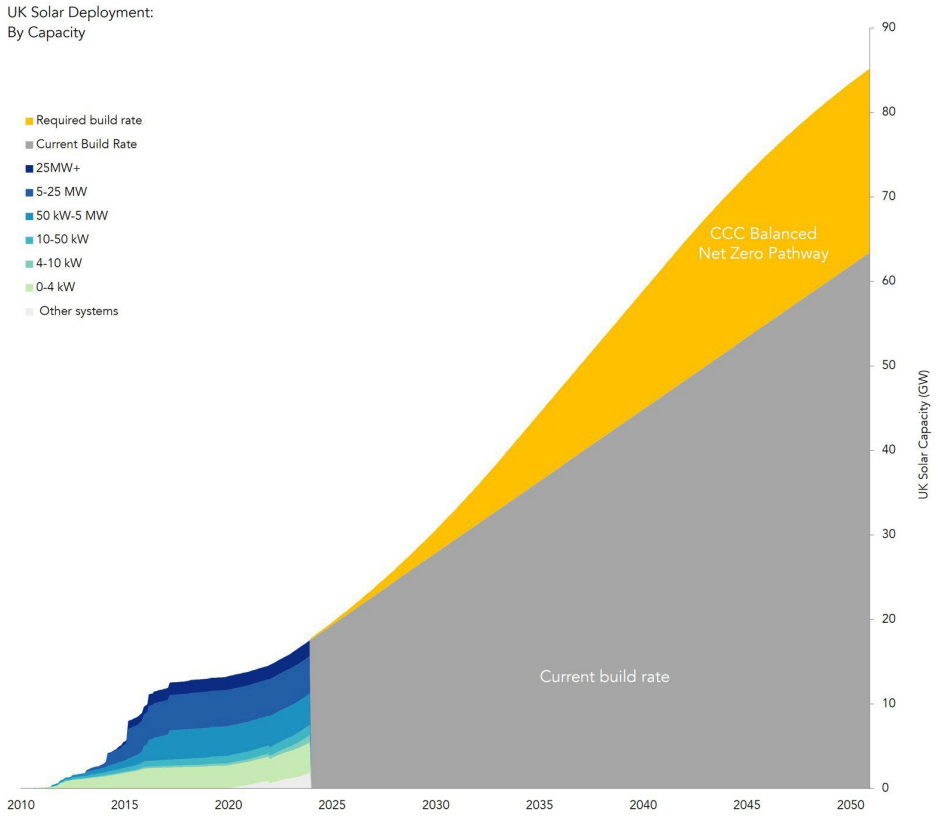
Where should solar be installed?

Around a quarter to a third of solar capacity installed in the UK is thought to be located on buildings, with the remainder being utility scale ground mount systems on green or brownfield sites. In the future, it will be important to continue to install solar panels on buildings to maximise benefits to occupants and reduce pressure on greenfield sites. Installing solar systems on 30 – 50% of homes in Cornwall would represent a reasonable contribution toward the UK's overall targets for solar deployment. If this proportion were to be achieved across the country it would result in around 45% of UK solar being generated from systems mounted on homes.

Benefits of building mounted solar

The levelised cost of electricity produced by domestic solar systems is typically around 7-10p/kWh. This is 60-75% less than current price cap rates and demonstrates how installing solar panels can be a very effective way to provide significant long-term reductions in energy cost for occupants, particularly as heat and transport electrify.

While utility scale ground mount solar can provide even cheaper electricity, this is usually sold to electricity suppliers at lower wholesale prices, unless it is part of a microgrid that can sell energy to homeowners at retail prices. The retail cost of solar electricity provided by microgrids is usually less than the retail cost of grid electricity, but higher than the cost of owning your own solar system.



The UK's solar build rate has increased significantly in the past few years, but still needs to accelerate more to be on track for the quantity required in the Climate Change Committee's Balanced Net Zero Pathway. Much of this can be installed on existing buildings to reduce electricity bills and pressure on greenfield sites. Based on solar deployment data from DESNZ and Solar Power Portal.

What about solar water heating?

Solar water heating can be an effective solution in some situations, however, whilst it can contribute to a household's hot water energy use in some situations, using a solar PV array and/or a heat pump is usually a simpler and more cost-effective solution. Solar hot water has a relatively small application so finding installers and operatives able to maintain the systems may be more challenging than for mainstream systems.

Whole House Retrofit Planning

What is a whole house retrofit?

A whole house retrofit is a comprehensive plan for home improvements. This does not mean that everything has to be done at the same time, but improvements should be made in a way which is compatible with the end goal, and that does not compromise the health of the residents or the building.

Key issues such as air quality, damp, overheating, mould growth and ventilation are easier to manage when retrofit is delivered as part of a structured plan instead of through a series of ad hoc interventions.

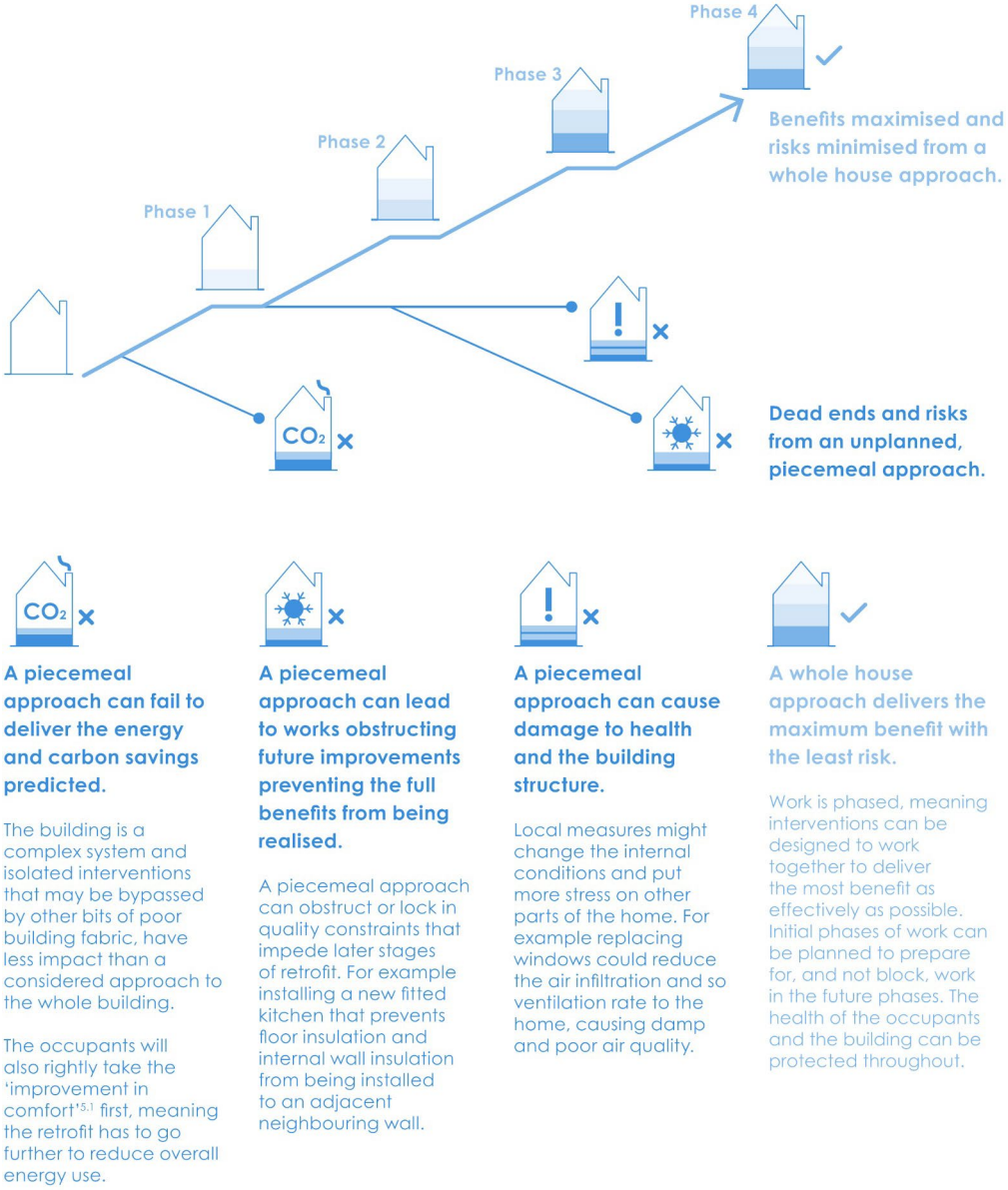
What are the main considerations?

It is now commonly agreed that retrofit should be done in a holistic manner which addresses the following key objectives:

- Addressing existing building defects.
- Providing a low carbon heating and hot water system.
- Providing a continuous insulating layer where possible and developing a clear approach to interfaces, edges and junctions.
- Having a clear winter and summer ventilation approach.

How far do we go with energy efficiency?

A consensus is now emerging that whole house plans at scale should seek to immediately deliver electrification of heat, while aiming for modest reductions in space heat demand over time, with fabric and ventilation upgrades carried out at appropriate points in the building's lifecycle. The following pages explore recommended metrics for measuring progress in decarbonisation, and performance targets for a decarbonised housing stock.



Advantages of a whole house approach to retrofit, versus a piecemeal approach. Source: LETI's Climate Emergency Retrofit Guide.

How this translates into the recommended approach to housing decarbonisation

Decarbonising existing housing is a complex challenge because every home is different. This complexity can be daunting and a barrier to action. The flow diagram on the right proposes a process to overcome this barrier. It shows the pathway that homes need to follow.

Electricity supply

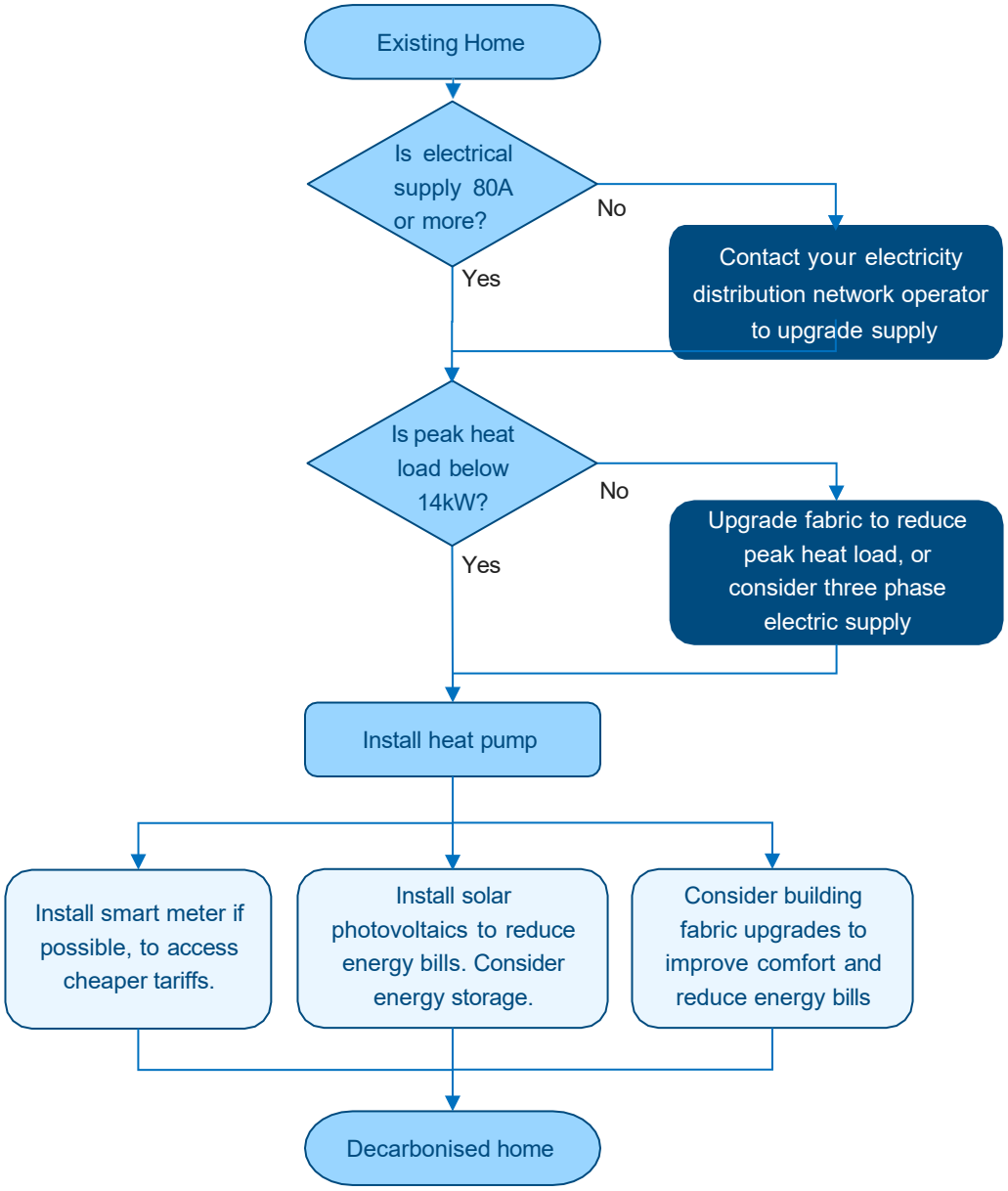
Some homes have a low enough heat demand to be able to have a heat pump on a standard single phase electrical supply (minimum 80Amp), and some currently do not. The first step for every home is to check that there is an adequate electrical supply for a heat pump to be installed. Where required, National Grid Electricity Distribution are able to provide upgrades to a minimum 80A single phase supply free of charge, but the resources to do the work are limited and it therefore will take time.

Does the fabric need to be upgraded now?

Based on a maximum single phase electrical supply capacity of 80A, the highest corresponding heat output from a standard heat pump is around 14kW. This sets a practical limit on the peak heat load for most ordinary homes, beyond which fabric upgrades or a three phase electrical supply will be necessary.

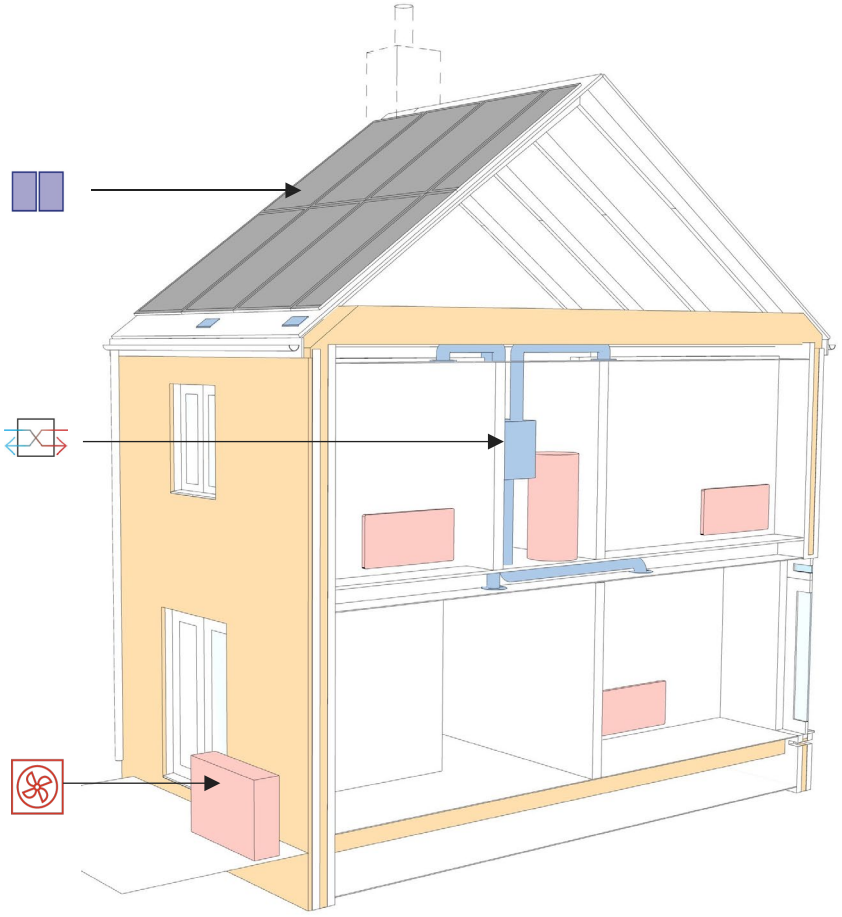
High level decarbonisation strategy for each home.

Once a heat pump has been installed to decarbonise the heating system, remaining work can be carried out in stages that work with the building's lifecycle and budget for additional measures. The specific measures that can be carried out will depend on the building and how it is occupied by the residents, but all are important aspects of delivering affordable net zero homes.



Example decarbonisation strategy for a simple home in three steps

Each home will have a bespoke process for decarbonisation. This is an example process, which is anticipated to be relevant in principle for a high proportion of homes. See appendices for details on individual measures. Any 'easy win' measures should be brought forward to an earlier step if opportunities arise, or if particular needs are identified.



Step 1 - low carbon heat and 'easy wins'

Air source heat pump installed at the earliest possible stage.

Hot water tank (heat pump or electric)

Maintain existing radiators and pipework or increase radiator size if needed.

Electricity supply capacity Use the process described later to determine whether it is necessary to upgrade the heating supply

Solar photovoltaic panels (early if possible)

Top up loft insulation or insulate rafters if required. Ensure adequate ventilation below rafters and continuity with cavity wall insulation.

Step 2 - high impact fabric measures

New / replacement cavity wall insulation where appropriate

Windows and doors, good quality double or triple glazed, installed in centre of insulation line. Upgrade ventilation together.

Draught proof around junction with floor, windows and doors. Consider junctions at corners, roof and ground.

Ventilation – MVHR will need to be located close to external façade, and ducted through wall or roof.

Step 3 - more complex fabric measures

Remove chimney to void risk of roof leakage and improve airtightness of external envelope

External wall insulation on all façades. Consider junctions at corners, roof and ground.

Insulate under raised timber floors and above or below concrete floors.

Proposed approach to decarbonise homes in Cornwall (at stock level)

This approach focuses on a strategy of decarbonising heating systems as quickly as possible and suggests the order in which measures should be implemented for homes with five different starting points, shown in the diagram

Heat pump readiness and decarbonisation approaches

Heat pump readiness of a home can be identified by a combination of its fabric efficiency, its volume (as an indication of heating load), heating emitter size and electrical supply capacity. The level of heat pump readiness has been used to derive five types of home, which can be be simplified into two categories: *Heat pump ready* and *Enabling work first*. The table to the right shows these different approaches in order of how easy it would be to install a heat pump as a first step, and indicates any building fabric, heating emitter and electrical supply upgrades required.

Heat pump ready homes

Heat pump ready homes have the potential to install a heat pump straight away or very soon. Some minor fabric or heat emitter modifications could be necessary alongside the heat pump installation, or to make the system more efficient. Electricity supply capacity should be checked and National Grid's process to apply for an upgraded supply followed to resolve any issues. Post 2000 homes are unlikely to need an upgrade and can usually connect and then notify the electricity provider.

Enabling work first homes

Enabling work first homes require some intervention before a heat pump should be installed. This could include changes to the building fabric and/or heat emitters. Upgrades to the heat emitters may have the potential to reduce the extent of initial fabric works required. Electricity supply capacity should be checked and National Grid's process to apply for an upgraded supply followed to resolve any issues. A three-phase supply may be necessary where heating load cannot be reduced below 14kW.

			Upgrades required before heat pump		
			Building fabric	Heat emitters	Electrical supply
Heat pump ready homes	1	Heat pump ready	*None*	*To optimise only*	*None*
	2	Heat pump ready with electricity supply upgrade	*None*	*To optimise only*	*Potential Upgrades*
	3	Heat pump ready with minor fabric, electricity supply, and heat emitter upgrades	*Minor upgrades*	*Potential upgrades*	*Potential Upgrades*
Enabling works first home	4	Moderate fabric modifications required	*Moderate upgrades*	*Potential upgrades*	*Potential upgrades*
	5	Major fabric modifications required	*Major upgrades*	*Upgrade*	*Potential upgrades*

This table summarises the five different types of home based on heat pump readiness, starting from the most heat pump ready to the least.

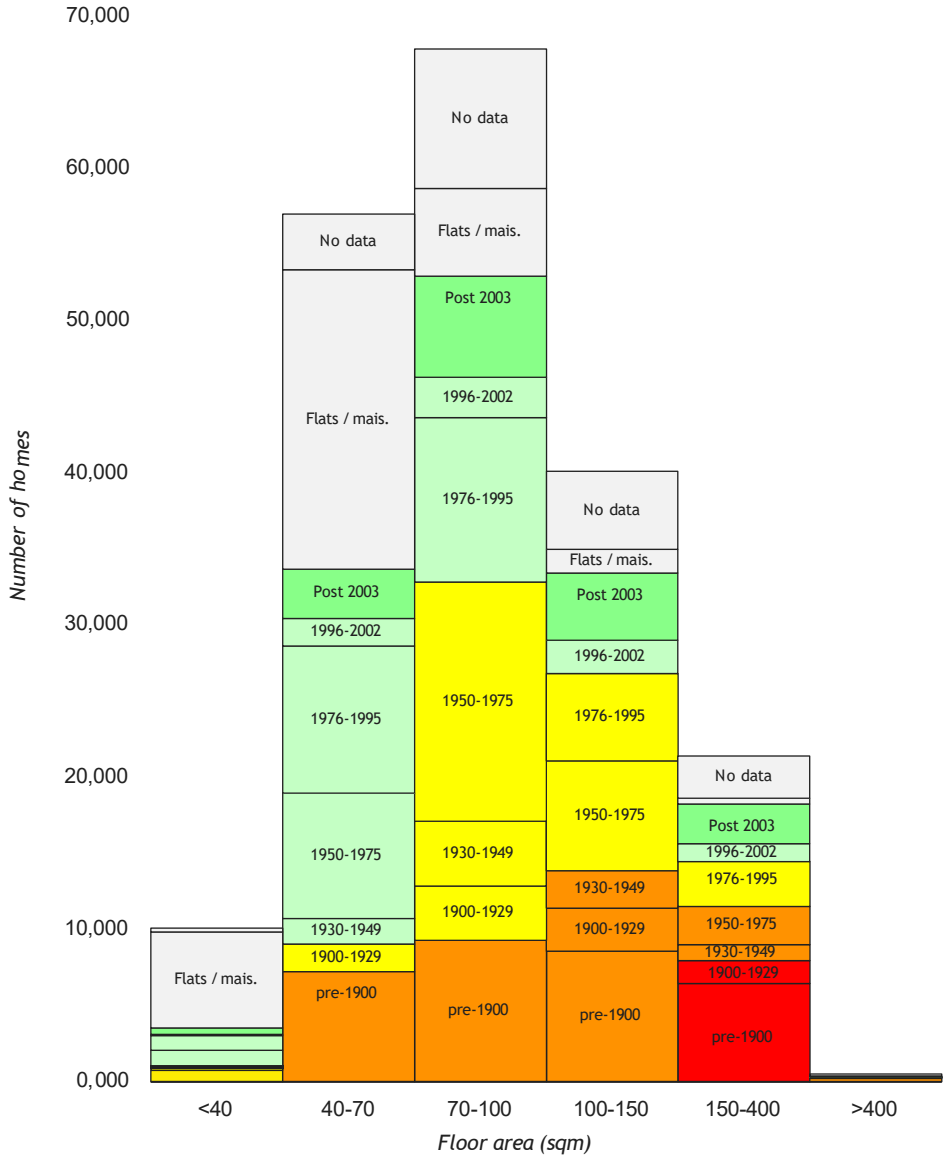
Proportions of homes in Cornwall

The chart to the right shows the proportions of homes anticipated to fall into each of the five categories of heat pump readiness. This is estimated from the EPC data, based on the age and size of properties, and is representative of two thirds of Cornwall housing.

It should be noted that age and size are good indicators of heat pump readiness, but other factors will impact on heating load. For example, an older home which is well orientated, with sensible window proportions, smaller rooms and reasonable shading conditions, may have a lower heating load compared with a more modern, open plan home with poor orientation and large window proportions on a very shaded site.

Our modelling used a range of possible values for key fabric parameters to enable us to understand the likelihood of homes within different size and age bands requiring work before a heat pump could be installed. More detail on the process to derive this is given in the appendices.

	Heat pump ready homes		
1	Heat pump ready	17,358	(12%)
2	Heat pump ready with electricity supply upgrade	40,487	(28%)
3	Heat pump ready with minor fabric, electricity supply, and heat emitter upgrades	42,212	(30%)
	Enabling works first homes		
4	Moderate fabric modifications required	33,981	(24%)
5	Major fabric modifications required	8,235	(6%)
--	No data	22,727	
--	Flats and maisonettes	33,707	



The chart above gives a visual representation of the likely proportions of heat pump ready homes using the floor area and age distribution as an indicator of heating load, and the table to the left gives numbers of these homes from the EPC data (representing two thirds of Cornwall homes).

Proposed housing decarbonisation metrics

Use of appropriate metrics is necessary to monitor progress in decarbonising Cornwall's housing stock, both at the level of individual homes as they proceed along their retrofit journeys, and also at the stock level.

The problem with EPC Energy Efficiency Ratings (EPC EERs)

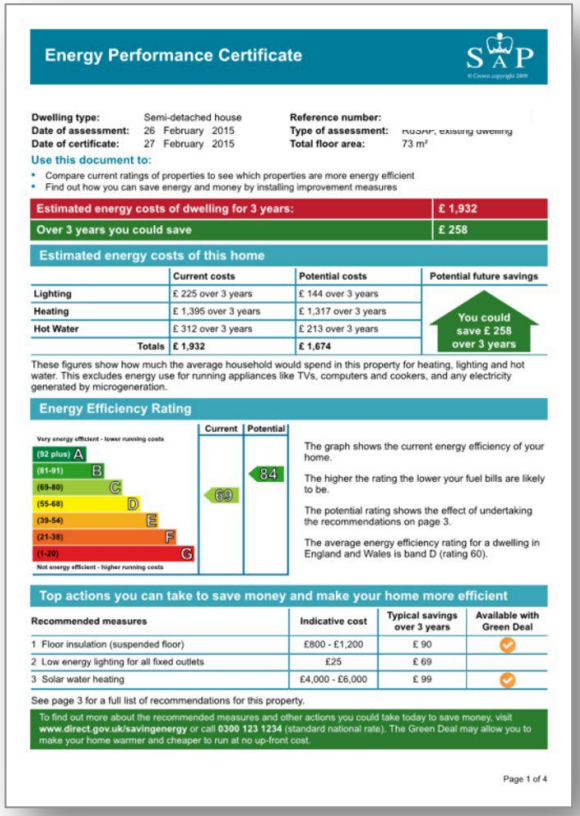
The 'A to G' Energy Efficiency Rating (EER) provided on EPCs is often considered to be the de facto metric for scoring the 'efficiency' of homes. This is currently unsuitable to measure progress toward decarbonisation though, as it is actually an energy cost rating, rather than a true energy efficiency rating. The methodology currently used to calculate EPC ratings is also outdated and does not provide reliable energy performance estimates. This could change in the future.

Recommended metrics for housing decarbonisation strategy

A simple set of metrics are recommended. These include the same metrics that are already used by Cornwall Council for the SEC 1 new build homes policy, which have also been used by various industry groups seeking to define appropriate levels of performance for retrofit. In addition, we recommend use of a metric specifically focused on ending fossil fuel heating, resulting in four metrics to use in strategic planning, some of which are measurable at the meter:

1. Fossil fuel heating (yes/no)
2. Total energy use (kWh/m^2/yr)
3. Space heating demand (kWh/m^2/yr)
4. Renewable energy generation (kWh/m^2/yr)

These metrics are generally suitable for energy modelling of large numbers of buildings, energy modelling of retrofit plans for specific architypes, or for analysis of metered energy use data.



Energy Performance Certificate

SAP

Dwelling type: Semi-detached house
Date of assessment: 26 February 2015
Date of certificate: 27 February 2015
Reference number:
Type of assessment: RdSAP, existing dwelling
Total floor area: 73 m²

Use this document to:

- Compare current ratings of properties to see which properties are more energy efficient
- Find out how you can save energy and money by installing improvement measures

Estimated energy costs of dwelling for 3 years:	£ 1,932
Over 3 years you could save	£ 258

Estimated energy costs of this home

	Current costs	Potential costs	Potential future savings
Lighting	£ 225 over 3 years	£ 144 over 3 years	You could save £ 258 over 3 years
Heating	£ 1,395 over 3 years	£ 1,317 over 3 years	
Hot Water	£ 312 over 3 years	£ 213 over 3 years	
Totals	£ 1,932	£ 1,674	

These figures show how much the average household would spend in this property for heating, lighting and hot water. This excludes energy use for running appliances like TVs, computers and cookers, and any electricity generated by microgeneration.

Energy Efficiency Rating

	Current	Potential
(92 plus) A		
(81-91) B		84
(69-80) C	69	
(55-68) D		
(39-54) E		
(21-38) F		
(1-20) G		

The graph shows the current energy efficiency of your home.

The higher the rating the lower your fuel bills are likely to be.

The potential rating shows the effect of undertaking the recommendations on page 3.

The average energy efficiency rating for a dwelling in England and Wales is band D (rating 60).

Top actions you can take to save money and make your home more efficient

Recommended measures	Indicative cost	Typical savings over 3 years	Available with Green Deal
1 Floor insulation (suspended floor)	£800 - £1,200	£ 90	✓
2 Low energy lighting for all fixed outlets	£25	£ 69	
3 Solar water heating	£4,000 - £6,000	£ 99	✓

See page 3 for a full list of recommendations for this property.

To find out more about the recommended measures and other actions you could take today to save money, visit www.direct.gov.uk/savingenergy or call 0300 123 1234 (standard national rate). The Green Deal may allow you to make your home warmer and cheaper to run at no up-front cost.

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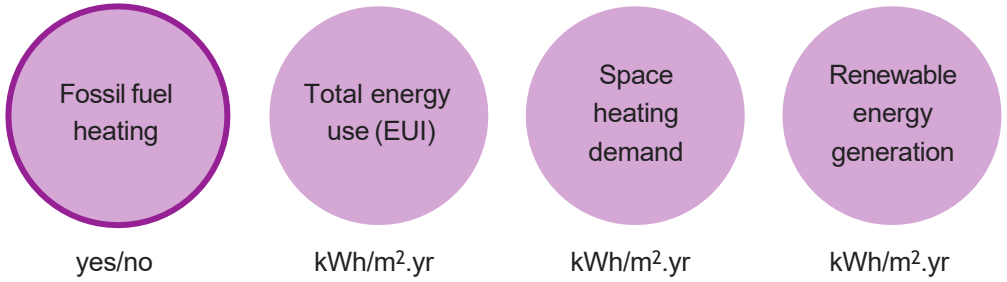
The Energy Efficiency Rating letter on EPC's is based on the cost of energy required to provide space heating, water heating, pumps and fans, and lighting, less any savings from solar generation. As high carbon fuels can result in low operating costs and good EPC scores, it is not a suitable indicator for housing decarbonisation.



Recommended metrics for Cornwall's housing decarbonisation strategy

Proposed targets

End fossil fuel heating

To deliver emission reductions in line with a 1.5˚C carbon budget, emissions reductions of at least 58% need to be achieved by 2030 across all sectors. Translating this into a specific target for housing is complex (refer to Appendix 1), but our scenario modelling indicates that a challenging target of around 55% of fossil fuel heating systems need to be replaced by 2030, and close to 100% by 2050.

Total energy use

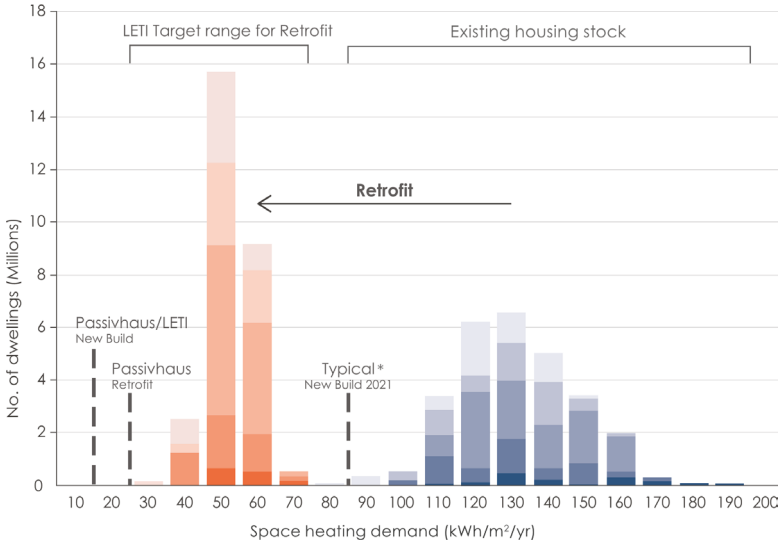
A target of 50 kWh/m^2/year has been recommended by LETI in their Climate Emergency Retrofit Guide, with a relaxed target of 60 kWh/m^2/year for harder to treat buildings – a value also recommended by RIBA. At a strategic level it is recommended that these targets are adopted for Cornwall.

Space heating demand

A target range of 40-70 kWh/m^2/year, depending on dwelling type, has been recommended by LETI. Given the numerous co-benefits, it is recommended that the LETI range is adopted as a long-term target for Cornwall, with exceptions for hard-to-treat homes. The University of Exeter's work outlines most of the measures required, however the timing of these measures should be relaxed in cases where this can enable faster decarbonisation of heat.

Renewable energy generation

National guidance from industry groups is simply to 'maximise renewables'. In practice, most renewable energy systems will be designed to make best use of available space, which is more practical than imposing per-dwelling targets. Installing PV on 30-50% of houses in Cornwall would represent a fair contribution toward the 70-85GW of solar capacity that is required by 2050. The upper end of this range prioritises rooftop systems to reduce pressure on greenfield sites.



Recommended space heating demand targets pre (blue) and post (red) retrofit, developed by LETI based on stock modelling of UK dwellings. It is proposed that these be considered long-term targets for phased retrofit.

3.0

Costs and funding

Target Outcomes
Create a supportive investment environment for housing decarbonisation & retrofit, while driving down upfront costs, maximising funding opportunities and ensuring affordability

The costs of an example decarbonisation project and also the wider funding environment for retrofit work.

This section should be read in conjunction with Appendix 3

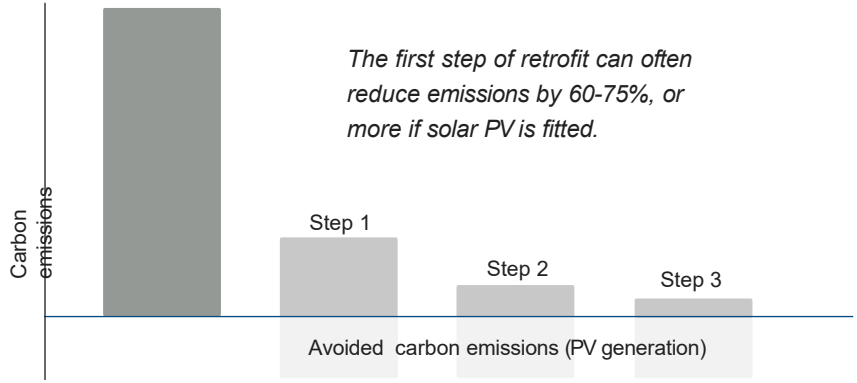
How much will it cost to decarbonise homes?

Cost of retrofit measures

It can be challenging to accurately assess retrofit costs. They depend on the home's characteristics, state of repair and on which works are required. It also depends on whether the 'energy' retrofit measures will be delivered on their own or whether they will be combined with other renovation and modernisation works. An indicative guide for all the measures required for a medium to deep whole house retrofit is shown in the table to the right, for a small, heat pump ready, home.

The first step of retrofit is often affordable

- Step 1 involves installation of a heat pump and hot water tank, basic insulation measures such as loft insulation and draught proofing. Install solar PV early if possible, to reduce energy costs.
- Step 2 involves further improvements to the building's fabric such as new windows, which could be planned to coincide with the end of life of the existing windows. A mechanical ventilation system with heat recovery is installed when any significant airtightness improvements are made, to improve indoor air quality.
- Step 3 involves a final package of improvements to the building's fabric, delivered through wall and floor insulation.



The first step of retrofit can often reduce emissions by 60-75%, or more if solar PV is fitted.

Measures		Cost
	Heat pump (e.g. *air to water* or *air to air*) and direct electric hot water tank	£3,000 £10,000
	Improved draught proofing if necessary - e.g. filling cracks. Substatial airtightness should trigger a ventilation strategy overhaul.	£0 £1,500
	Loft insulation if requried - 200-400 mm (40m^2)	£1,000 £4,000
	Photovoltaic panels, 5 kWp array (10-12 panels) where possible	£6,000 £11,000
	Initial step (example)	**£3k - £26.5k**
	PV, if not installed earlier	£6,000 £11,000
	Good double / triple glazed single casement (per m^2)	£900 £1,300
	New entrance door (1 unit)	£800 £3,000
	Mechanical ventilation with heat recovery - MVHR with associated ducts (earlier if substantial airtigness in first phase).	£4,000 £7,000
	Final step (example)	**£17k - £38k**
	Wall insulation, external - 100-200mm (110 m^2)	15,950 £35,200
	Suspended floor - 100mm insulation (40 m^2)	£3,000 £5,000
	Exemplar step (example)	**£19k - £40k**

The above cost estimates are for a heat pump ready or close to heat pump ready house, which accounts for around 70% of Cornish homes. Some of the smaller "enabling works first homes" may also be able to achieve retrofit within these cost ranges, which would make this applicable to in excess of 80% of Cornish homes. These figures are estimated at Q3 2024 and are only indicative estimates per measure. A specific cost plan must be undertaken for each retrofit.

Funding

Funding can come from a variety of sources, including: mortgages, loans, cash savings, investment, and grants. Grant schemes vary over time and have been directed towards a combination of social housing landlords, the public sector, and private homeowners. While they can be a useful way of accelerating decarbonisation, grants do introduce risk of creating dependency on support within the supply chain.

Direct funding by Cornwall Council

Direct funding of decarbonisation measures is unlikely to be affordable for the council. Providing loans rather than grants may be more effective but even so other sources of funding will be needed to reduce emissions within a 1.5˚C carbon budget.

External funding

Cornwall Council's time and resource may be able to achieve larger emission reductions faster by focusing on creating an internal team who are able to:

- Identify and track external sources of funding as they change.
- Quantify the number of buildings that could benefit from these sources of funding.
- Understand the eligibility criteria and develop strategies to efficiently maximise use of available funding.
- Link funding to eligible buildings.
- Identify funding gaps that need to be filled to ensure sections of the housing stock are not 'left behind'.
- Proactively mitigate issues that come with some funding, for example ECO4 funding has been associated with poor quality installations of heat pumps, fabric retrofit and solar photovoltaic technologies. Identifying competent installers, conducting system design reviews, installation checks, and/or post-commissioning checks could mitigate these risks.

Scheme	Funding	Years of funding in next spending review period	Status
Boiler Upgrade Scheme	£1545m	2025/2026 2027/2028	Active
Heat Pump Investment Accelerator	£15m	2025/2026	Closed
Energy Efficiency Grant	£400m	2025/2026 2027/2028	
Local Authority Retrofit Scheme	£500m	2025/2026 2027/2028	
Social Housing Decarbonisation Fund	£1253m	2025/2026 2027/2028	
Heat Network Transformation Programme	£530m	2025/2026 2027/2028	
Public Sector Decarbonisation Scheme	£1170m	2025/2026 2027/2028	
Industrial Energy Transformation Fund	£225m	2025/2026 2027/2028	
Industrial Energy Efficiency and decarbonisation	£410m	2025/2026 2027/2028	

Summary of current and recent funding sources for decarbonisation measures.

Energy costs for residents and affordability

The adjacent graph illustrates key measures that can be taken for the energy costs of heat pumps to be significantly lower than residents are currently paying with an oil or gas boiler. All scenarios use the levels of energy use assumed by OFGEM for energy price cap calculations: 11,500 kWh of heating fuel (assumed to provide 9,775 kWh of heat at 85% efficiency) and 2,700 kWh of electricity. Electricity prices are assumed to be the 2024 Q1 price cap rate of 28.62p/kWh unless otherwise stated.

Oil boiler - £1,900

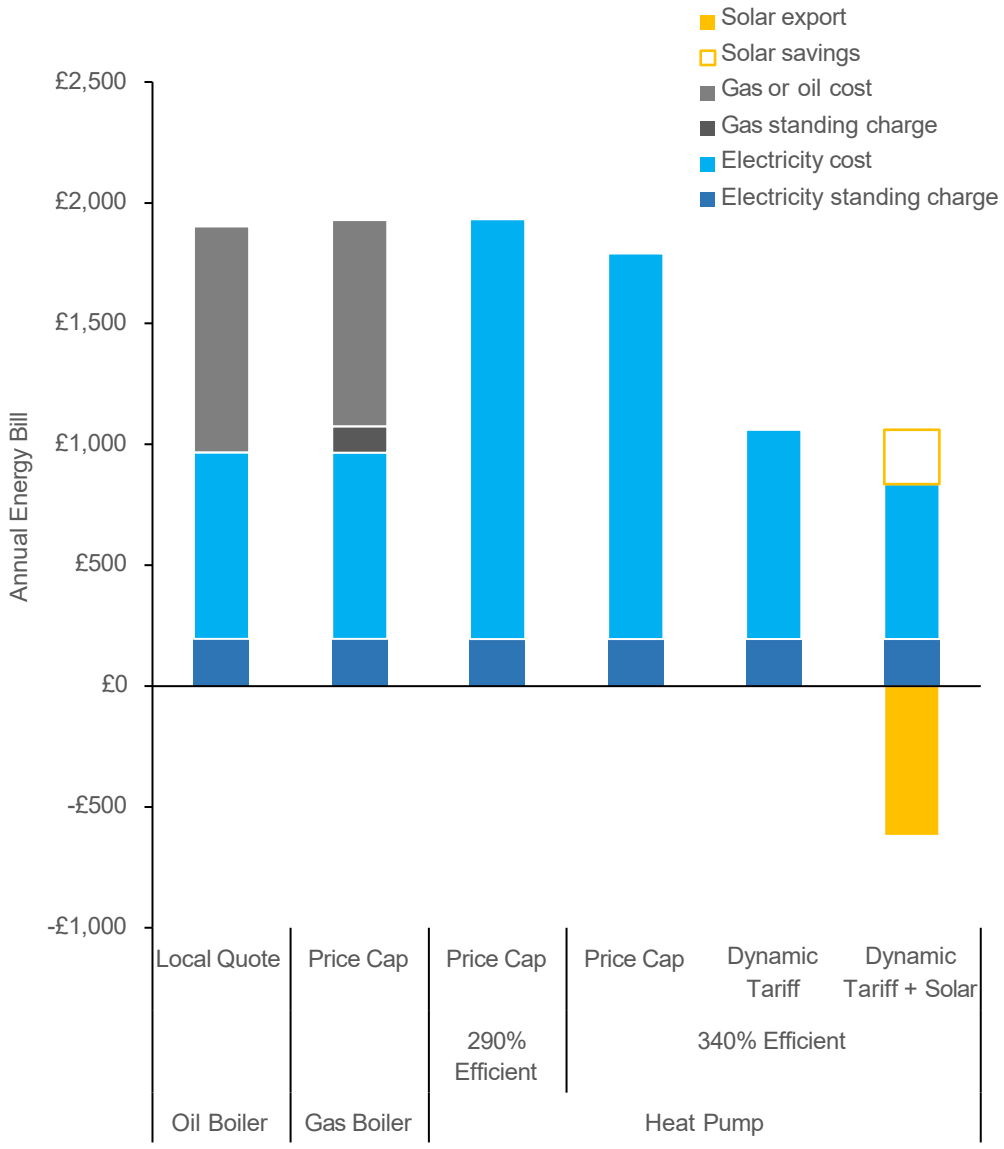
Oil prices are based on a 2024 Q1 quote for 1,100l (11,500 kWh) of heating oil including delivery costs from a local provider in Cornwall.

Gas boiler - £1,930

Gas prices are based on the 2024 Q1 price cap rates of 7.42p/kWh and 29.6p/day for the standing charge, resulting in annual heating costs that are similar to an oil boiler.

Heat pump

Four heat pump scenarios are considered. The first assumes a seasonal efficiency of 290%, the median achieved in the Electrification of Heat field trials, and the price cap rate for electricity, resulting in an annual cost of £1,930. The second scenario assumes an improved heat pump efficiency of 340%, a value achieved by skilled installers such as Good Energy and Heat Geek, reducing costs to £1,790. The third scenario assumes use of a dynamic electricity tariff. Based on analysis of historical price data this results in savings of around 45% relative to a gas boiler, with annual costs of £1,060. The final scenario assumes a 5.1kW PV array is installed so the property achieves a net zero annual energy balance. With an export tariff of 15p/kWh based on 2024 Q1 Smart Export Guarantee tariff comparison tables, and assuming 26% self-consumption based on MCS guidance for a home occupied for half the day. This results in energy costs of just £220, an 89% reduction compared to gas.



There is a clear pathway to affordable electrification for customers on direct debit by combining efficient heat pumps with dynamic electricity tariffs and on-site solar generation.

Social value

"The right home environment protects and improves health and wellbeing. A warm, dry and secure home is associated with better health and prevents physical and mental ill health"

Director of Public Health 2023 Annual Report

Decarbonisation doesn't only reduce carbon emissions

Decarbonisation of existing buildings generally and housing specifically brings wider benefits to residents, communities and the region. The key co-benefits of tackling fuel poverty, improving health for residents and supporting the local economy have been considered throughout the strategy.

There are other co-benefits of decarbonising homes:

Improving local air quality

Eliminating the burning of fossil fuels reduces air pollution locally as well as reducing carbon emissions to the atmosphere. Gas boilers produce carbon monoxide, nitrogen oxides.

Safety

There will be fewer accidents involving gas appliances and boilers.

Reducing costs to the NHS

Poor quality housing resulting in damp, mould, poor indoor air quality, excessive cold in winter, overheating in summer and other health impacts increases costs to the NHS. These effects especially impact the very young and very old.

Skilled jobs in the local economy

A local programme of decarbonisation means consistent work for skilled installers, designers and maintenance operatives within the local area.

Combustion pollutants and their health effects

- Carbon monoxide (CO), a dangerous gas that when inhaled can interfere with the ability of blood to carry oxygen from the lungs to the rest of the body
- Nitrogen oxides (NOx), a respiratory irritant that causes airway inflammation, coughing, wheezing and increased asthma attacks
- Particulate matter (PM), a mixture of microscopic solids and liquids that affects multiple body systems and can increase the risk of premature death
- Air toxics, including as ammonia, formaldehyde, polycyclic aromatic hydrocarbons (PAHs) and volatile organific compounds (VOCs) that can cause cancer, birth defects and other serious health harms

Burning of fossil fuels including gas is a source of indoor and outdoor air pollutants. Source: American Lung Association

The Government predicts housing quality impacts will increase as the population ages. According to census data, Cornwall's population is generally older than the UK overall, so these effects could be more pronounced. NHS costs source: BRE, (image source: gov.uk)

4.0

Supply chain

Target Outcome

Support the growth of the local green economy to match the resources required for sustainable development and home retrofit at scale

The key strategic measures required to facilitate the decarbonisation of housing in Cornwall.

This section should be read in conjunction with Appendix 4

Training and skills

Importance of training heat pump installers

When a heating system fails, often the first contact a homeowner has is with a heating engineer. Heating engineers are unlikely to recommend fitting a heat pump unless they have been trained to install them, so installer training is vital to increase uptake.

Good systems can operate reliably for many years providing low carbon heat for lower costs than fossil fuel or direct electric heating systems. Conversely, poorly installed heat pumps may not adequately heat a dwelling and be expensive to run. The performance of a system is largely dependent on the knowledge and skill of the heat pump installer and means adequate installer training is particularly important to delivering affordable electrification of heating.

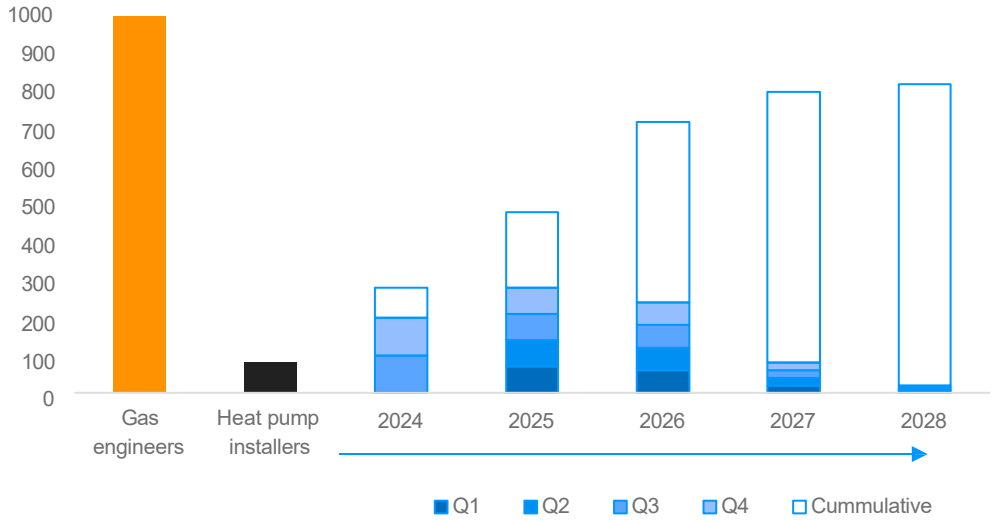
Planning training to deliver the required number of installers

There are currently 1000 heating engineers on the gas safe register records for Cornwall, but the number of heat pump installers is thought to be between 50 and 100 based on MCS database records, in addition to around a dozen companies that provide air conditioning and can be expected to install air-air heat pumps.

Replacing fossil fuel heating systems in existing buildings as they reach the end of their useful lives will require 500 heat pump installers, in addition to another 170 to meet demand for new-build housing throughout the 2020's. Another 200 are required to ensure 55% decarbonisation by 2030 is achievable.

Training must be affordable

Training or retraining can be prohibitively expensive. Trainees may have to take time off from paid work to attend courses, and will also have to pay for course fees, travel, and accommodation if local training is not available. Training should be available at flexible times and with shorter courses. This can mitigate the need to take time off for training over the potential loss of paid work. Potential direct funding of some of these costs by the Council should be considered as a key strategic investment in accelerating decarbonisation.



Approximate number of registered Gas Safe engineers compared to estimated heat pump installers in 2023. Required numbers of additional heat pump installers that need to be trained indicated from 2024-2028. Beyond 2028, an annual training capacity of 20-30 is expected to be sufficient.

Training required for other trades

The solar industry has previously dealt with two large growth cycles and has established training programmes in place, so less intervention is thought to be necessary here.

Suitable training needs to be in place to ensure adequate delivery of building fabric and ventilation upgrades to ensure correct design and installation of:

- Wall insulation, to minimize moisture risk and cold bridges
- Airtightness measures, often with a new ventilation system
- Replacement windows, often with a new ventilation system
- Ventilation systems

Retrofit coordinators trained to implement the PAS2035 British Standard for retrofit will be needed to provide oversight and management for complex and / or large projects and those that rely on Government funding streams.

Quality Assurance

Overview

The installation quality of the main technologies required to decarbonise homes in Cornwall and across the UK can be highly variable. Unfortunately, problematic installations are not uncommon, even when covered under the adjacent first-tier schemes. This presents a risk to successfully decarbonising the housing stock, which needs to be overcome. The main way to do this appears to be either for Cornwall Council to encourage the operators of first tier schemes to strengthen their requirements, or to encourage or require installers to use second and third tier schemes, for example when selecting contractors for projects on Council-owned homes. Technology specific quality assurance issues are considered below.

Heat Pumps

Heat pump installations currently rely on MCS and its certification bodies, in combination with the RECC and HIES Consumer Codes to maintain quality. Additionally, Trustmark registration is required for ECO4 and SHDF funded installations. PAS2035 has been introduced to make these schemes more robust, but the results for heat pump systems are not yet proven. At present, third tier schemes are strongly recommended to ensure good outcomes.

Fabric Efficiency & Ventilation

Trustmark and PAS 2035 are the main second tier schemes covering fabric efficiency. As with heat pumps, use of third tier schemes/training such as those offered by the Retrofit Academy, Green Register, and Passivhaus Institute are recommended.

Solar Photovoltaics

Solar installations currently rely on the same first tier schemes as heat pumps, which can result in inconsistent quality. Currently there are few third tier schemes, though the National Energy Efficiency Awards include a category for good solar installers.

Internal training programmes

Third tier: Voluntary schemes, often represent best practice

Second tier: Required for access to SHDF, ECO4 funding etc.

First tier: Required for to access BUS grants for heat pumps or solar export payments

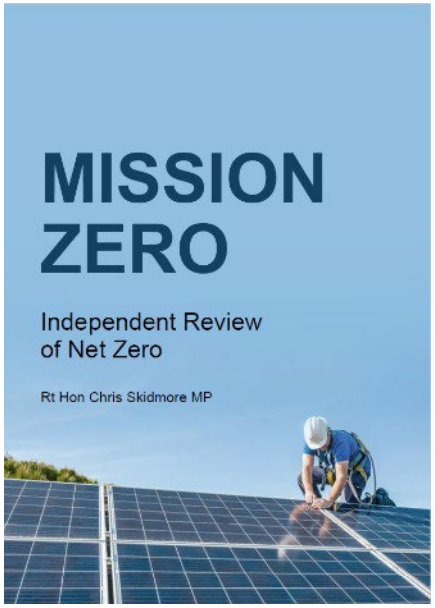
A variety of schemes and training operated by different organisations aim to improve quality assurance and consumer protections for low carbon technologies. This is achieved either by covering individual projects, or the installers. While these provide important protections, experience suggests that poor quality installations are not uncommon under the first tier, while the third tier, which also includes internal training programmes, seems to more consistently deliver good outcomes.

Supportive environment for investment

There is a shortfall in Government grant funding

The University of Exeter "Reducing greenhouse gas emissions from housing in Cornwall" (2023) report highlights a shortfall in funding between estimated costs to meet Cornwall's carbon budget and the Government grants available. Private investment could make up some of the shortfall, but for that to happen, there needs to be an environment which encourages businesses to plan for a decarbonised future and take steps to secure it.

The 'Mission Zero' report published in 2023, highlighted the need for a stable policy environment: *"….the Review has heard from many respondents frustrated by a lack of long-term thinking, siloed behaviour from government departments, and uncertainty over the length of funding commitments. Evidence suggests this is holding back deployment of green technologies, hampering investment across all sectors, and inhibiting the ability to create British jobs."* Cornwall Council cannot change the policies of national government, but it can make a clear statement of the intent and ambition of the local authority to support and encourage decarbonisation of housing over the near term.



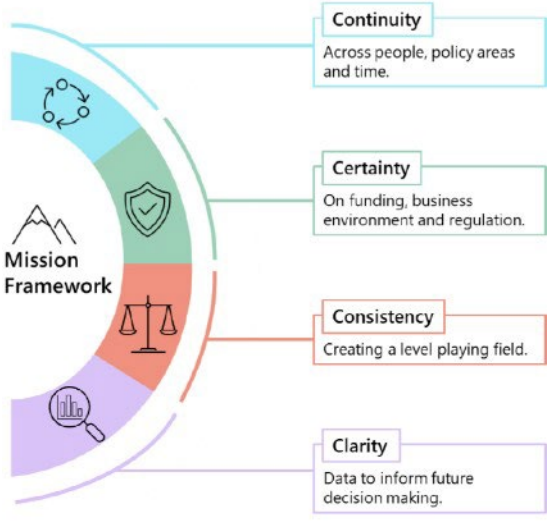


Figure 1.1 – *This Review takes a mission-led approach*

The Mission Zero report recommended a focus on stable policy and funding to encourage businesses and individuals to invest in net zero technologies (Image source: Mission zero report gov.uk)

Encourage community led thinking

Business investment is attracted to larger groups, which provide longer term and larger returns than individual homeowners acting separately. Place based archetyping can help identify groups of homes with, for example, similar window types or a whole village switching from oil boilers to heat pumps.

There have been a number of community led projects in Cornwall and the southwest where businesses have been able to invest in decarbonisation which individual residents could not have afforded – e.g. Kensa Utilities 'Heat the Streets' project which was part funded by European Regional Development Fund (ERDF)

Innovation is great but don't overlook the basics

Innovative solutions to collective problems can unlock apparently intractable issues. But simple steps, such as installing heat pumps and insulating lofts, should not be ignored because they are less newsworthy.

Delivery models

There is a lot of excellent and innovative work going on to scale up retrofit and refurbishment. The council and others can borrow and adapt existing models.

Parity Projects provide Whole House Plan web tools that show different 'pathways' and compare carbon and energy improvements across a whole stock to create a costed plan for retrofit of each home. It is aimed at local authorities, housing associations, homeowners and landlords who subscribe to the platform. Additional services and works can be provided to take it further,

Retrofitworks is a co-operative with two types of members, contractors and community groups or authorities. The cooperative brokers retrofit work between members and provides quality assurance. This provides contractors with a work pipeline, and authorities a trusted contractor work force. Retrofitworks was started by Parity Projects but is a fully independent member-owned cooperative.

The Carbon Co-op in Northwest England provide energy services and advocacy including consultant advice. Their tool, My Retrofit planner, gives a standardised format to give bespoke impartial consultant advice to homeowners. It recommends different strategies and helps householders form a whole house plan with the likely benefits at each step.

Bristol City Council Energy service is a dedicated Council team for improving energy efficiency in domestic properties. They provide: central application and dissemination of grant funding, guidance on grant schemes, and practical advice. Exploring crowd funding to raise capital for retrofit of community buildings and a strategic partnership with a provider to deliver some projects

Energiesprong is an implementation mechanism for retrofit to a net zero carbon standard. It uses energy cost savings from retrofit in a form of energy performance contracting. There have been a number of Energiesprong projects in the UK and more are currently in the planning stage, mainly through housing associations.

Engie Zero is Engie's version of the Energiesprong model helping councils to unlock finance on the basis of future savings, alongside an energy and comfort plan. An important difference however is that they act as a one-stop-shop, including delivery and, if needed, maintenance and monitoring (while Energiesprong act more as intermediaries).

SuperHomes, in Ireland, is led by the Tipperary Energy Agency. It is a one-stop-shop for homeowners taking them through the initial planning, tendering, and overseeing of the works. The packages include essential elements (e.g. homes have to have an air source heat pump, mechanical ventilation (demand control or MHVR) and insulation) as well as some tailored options. SuperHomes also help with grant funding of up to 35% of the works.

BetterHome, was started in Denmark by private companies Rockwool, Danfoss and Grundfos seeking to stimulate demand for energy efficiency products. It was a one-stop-shop for homeowners to partner them with an installer who would oversee the whole project delivery. There was no tie to using specific products. The scheme was successful and ran from 2014 to 2020 before being closed to new applications.

Infrastructure investment

Electricity grid investment

The electricity distribution network in Cornwall is operated by National Grid Electricity Distribution (NGED). Investment packages in the network must be pre-approved by OFGEM through the submission of business plans from each Distribution Network Operator on a 5 yearly rolling basis.

The current RIIO-ED2 price control period applies from April 2023-2028 and does include some allowance for investment in network upgrades ahead of need to facilitate the electrification of heat and transport. Nationally, average network costs for local electricity grids did not increase with this package, remaining at around £100 per billpayer.

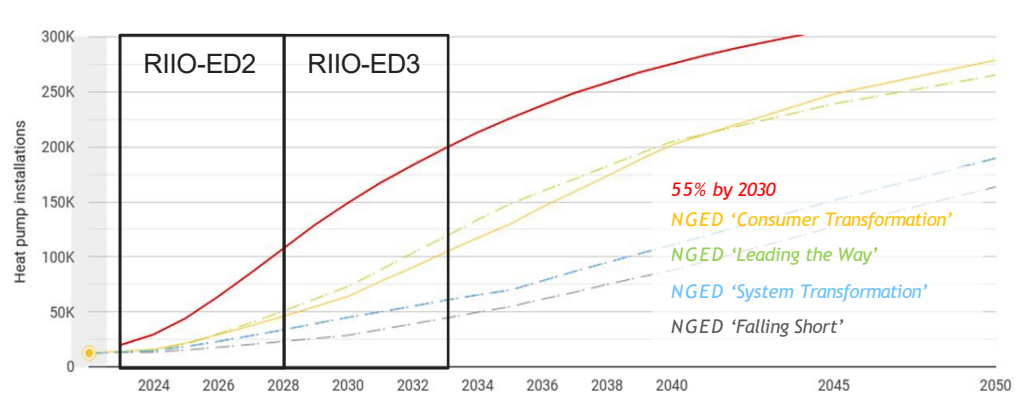
The proposed investment is based on NGED's Distribution Future Energy Scenarios that outline the range of credible futures for the growth of the distribution network, broadly aligning with the Electricity System Operator's (ESO) Future Energy Scenarios (FES).

The business plan submitted for the next price control period, RIIO-ED3, will need to be carefully designed through collaboration with National Grid Electricity Distribution to ensure the distribution network is able to support the ongoing decarbonisation of Cornwall's housing.

Gas grid decommissioning

The National Audit Office's recent report on decarbonising home heating highlighted that it is currently *"uncertain who will pay for the networks to continue in service with a decreasing customer base, or to be decommissioned, and how the government will ultimately manage the transition for the last remaining customers on a gas network."*

While decommissioning costs and processes are likely to be decided at a national level by OFGEM and the government and are currently being considered in the RIIO-GD3 consultation, it is an important subject that should also form part of local conversations around housing decarbonisation. At the scale of an individual dwelling, disconnection from the gas grid can be an important cost-reduction measure to eliminate standing charges and is often a key part of any retrofit plan.



The rate of heat pump installations required to replace 55% of fossil fuel heating systems by 2030 implies a more rapid rollout than is currently assumed in all National Grid Distribution Future Energy Scenarios. By 2030, the number of heat pumps could be twice as high as the most ambitious scenarios, and three times as high as the 'System Transformation' scenario, which is currently used as the 'Best View'. RIIO-ED2 and ED3 price control periods shown for context. (Image source: National Grid Electricity Distribution)

5.0

Raising awareness

Target Outcome

Raise awareness and provide support to enable homeowners and developers to follow the roadmap and pathways identified.

How to help the residents of Cornwall to recognise and respond to the need to decarbonise homes.

This section should be read in conjunction with Appendix 5

Heat pump ready people

Public awareness of heat decarbonisation

Public awareness of the need for heat decarbonisation is relatively low, with only 5% of the people interviewed for DESNZ's most recent Public Attitudes Tracker 'very aware', and 28% 'fairly aware', of the need to change heating systems to deliver net zero.

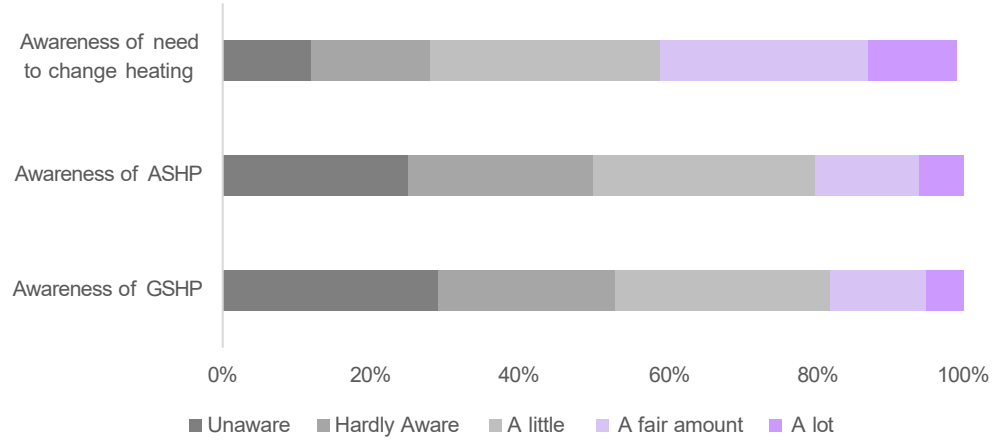
Only around 20% of people said they have a fair amount or a lot of knowledge about heat pumps, despite their role as the main low carbon heating solution. A similar proportion of people, around 15-21%, plan to install a heat pump the next time they need to change their heating system.

The most commonly cited reason for being unlikely to install a low carbon heating system was the perceived installation cost, with 51% of respondents stating this was a concern. Interestingly, the 2023 National Home Energy survey by The Eco Experts found that 73% of respondents were not aware of grants available for installing heat pumps under the government's Boiler Upgrade Scheme.

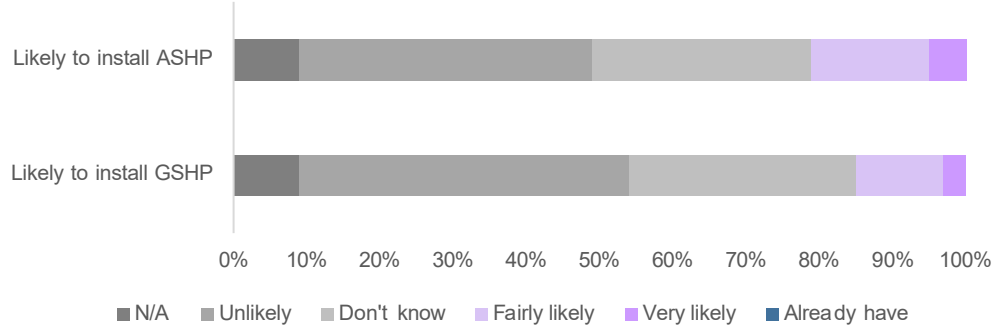
A plan to increase awareness

The low levels of awareness represent an excellent opportunity to increase the uptake of heat pumps, simply through public education efforts to ensure people are more aware of:

1. The importance of decarbonising home heating
2. The various types of heat pumps, and other low carbon heating systems
3. Capital costs and available grant funding and loans
4. Operating costs and how to reduce them
5. How to make a home heat pump ready
6. How to find a good installer and plan for boiler replacement
7. How to arrange maintenance and repair



DESNZ's Public Attitudes Tracker results from Winter 2023 indicate that only a third of people were aware of the need to change heating systems to deliver net zero, and less than 20% knew a fair amount, or a lot, about air or ground source heat pumps.



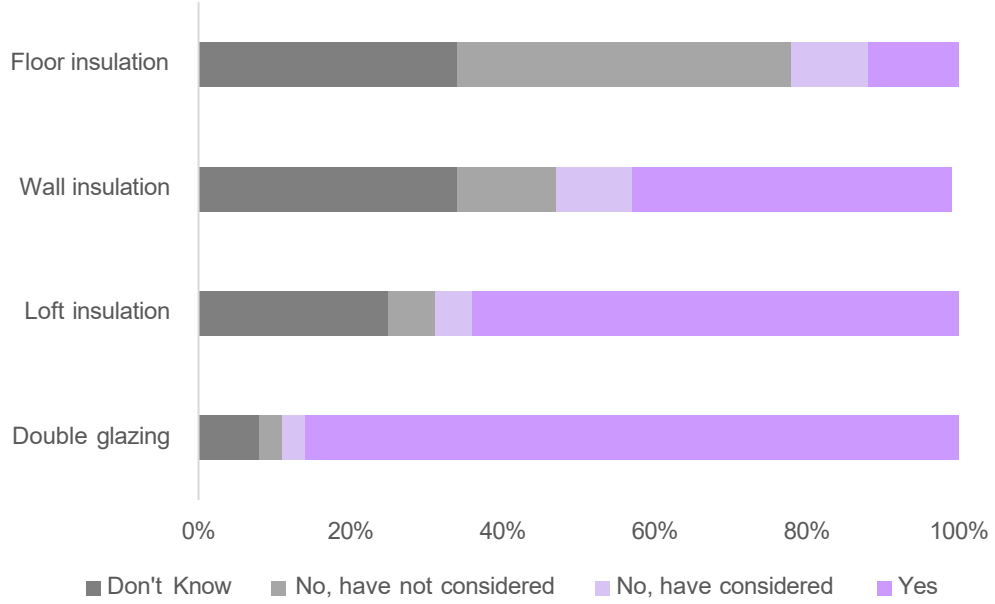
The tracker results also indicate that only 21% of owner-occupiers are likely to install an air source heat pump, or 15% a ground source heat pump, next time they need to change their heating system.

Awareness of fabric, ventilation and solar

Public awareness of insulation measures

Public awareness of fabric insulation measures is significantly higher than for heat pumps, particularly around double glazing where 89% of people either have it fitted or have considered it. Awareness of loft insulation is also fairly high, with 69% having fitted or considered it. Awareness around wall insulation (both cavity and external) is lower, while awareness of floor insulation is very low, with just 12% of people having fitted it and a further 10% considered it.

While these are national results, they indicate potential for increasing rates of floor, wall and loft insulation just by raising awareness.



DESNZ's Public Attitudes Tracker results from Winter 2022 indicate that most people already have, or have considered double glazing and loft insulation. Around half of people have or have considered cavity or external wall insulation, while only 12% of people have floor insulation.

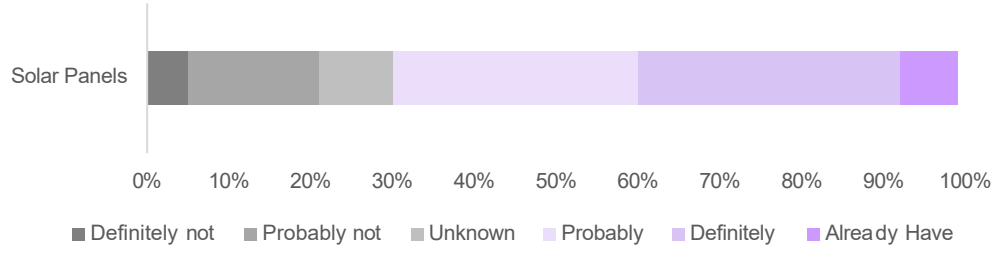
Public awareness of ventilation

The survey did not ask any questions around ventilation so no data is available. Given the importance of ventilation to creating a healthy and energy efficient living environment, particularly as airtightness is improved through better windows and other draught proofing measures, it would be helpful to establish a better understanding of levels of public awareness around the importance of ventilation. In the absence of this, promoting energy efficient ventilation as part of retrofit represents a low-regrets approach.

Public awareness of solar

Awareness of solar systems is very high, with 7% of people already having a system installed, 32% definitely planning on installing a system within the next few years, and a further 30% of people probably planning on installing a system. Just 5% of people definitely do not plan on installing a system.

This suggests that employing 'nudge' tactics may be an effective approach to increase solar deployment, for example by public awareness campaigns promoting ways of financing systems and communicating the benefits to encourage people to get on with installing a system.



The tracker results indicate strong support for solar panels. When asked if they would consider installing solar panels on their home in the next few years, 7% reported already owning a system, 32% were definitely considering them and 30% probably considering them.

Heat pump ready policy

Planning policy is not a universal solution, but it can help local plan policies to facilitate and encourage decarbonisation of buildings cannot provide a comprehensive solution to the challenges of retrofitting buildings because the majority of retrofits and refurbishments do not require planning permission, but they can provide a framework for the process and signpost the priorities and approaches that others can follow. Crucially, the Local Plan policies need to not create barriers to retrofit by preventing or discouraging good changes from being made.

Environmental and heritage conservation hand in hand

Low carbon retrofit of heritage and traditional construction buildings is possible. Well-planned retrofit programmes can contribute to conservation by incorporating maintenance and repair and offer a new lease of life to buildings. They limit the risk of under-heating, with the associated risks of fabric degradation.

People living in heritage homes and conservation areas can be particularly worried about how or if they can carry out retrofit work. There is some variance in the constraints associated with conservation areas, and every listed building is unique, so it is useful to provide guidance on what is possible and what may be acceptable. Particular areas of concern may be window replacement and solar PV.

Historic England have published guidance that can be used as a reference for what should be allowed and the Improving Energy Efficiency in Cornish Historic Buildings guidance has local examples of good practice.

Local conservation area management plans and other parish council planning / guidance documents have often not been updated in line with the more recent county-wide policies and many are out of date. A review of what there is and whether it conflicts with the climate emergency aims would be useful to provide clarity for anyone looking for guidance.

Air source heat pump locations that are least likely to visually or acoustically obtrusive, especially in conservation areas, can be identified, not only providing some useful technical guidance but also evidencing the fact that they often can be located in acceptable locations, even in historic settings. .

Removing unused chimneys which, even when blocked, are a large air leakage path and often a large source of moisture ingress. Chimneys that are not protected or critical to a street scape should be decommissioned and removed wherever possible.

Changes to window frame widths or removing glazing bars is often necessary to accommodate improved window performance. Glazing bars significantly impact window performance by being a thermal bridge through the glass and reducing useful solar gain.

Ventilation grilles are needed in external walls to provide supply and extract air and improve air quality. The MVHR location is important, sometimes the best location is on a street facing wall.

Space for external wall insulation and roof insulation in the pitch may require an overhang to the street or neighbour, or an increase in ridge height. Providing clear process for applying to highways, party wall surveyors, and even local permitted development for ridge height increases would make rolling out retrofit easier in many situations. This would need consultation with heritage officers.

Some examples of where retrofit could require planning and where guidance to suggest what may be possible could be helpful. (Image source: Rightmove)

Information Classification: PUBLIC

How to get a heat pump

Why awareness of this process is important

From the perspective of a property owner, the process of getting a heat pump will often be more complicated than replacing their existing heating system. Some of the steps required may involve lead times of several weeks or longer, meaning that if people have not made sure their property is heat pump ready before their existing heating system fails, they may need to consider living without a heating system for a period of time using a temporary heating system, or installing a replacement boiler. This is likely to be less of an issue for portfolio property owners, who have better understanding of their housing stock and heating systems and are able to plan heating system replacement at a stock level.

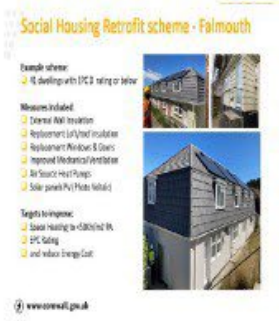
The following steps are typical for most heat pump installations in existing homes:

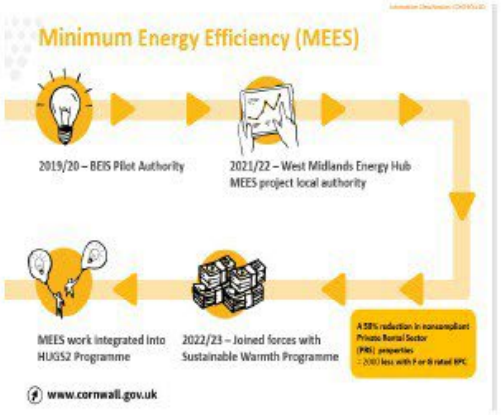
1. Check electrical supply capacity – as upgrades are usually done for free by your electricity distribution network operator, but can take some time to book in, it is sensible to ensure an adequate (usually 80A) supply is in place.
2. Heat loss estimate – as heat pumps are much more sensitive to oversizing than boilers, a detailed heat loss survey is important. This may cost several hundred pounds and usually includes calculations on any radiators that may need upgrading.
3. Insulation upgrades to reduce heat loss that may have been identified in the heat loss survey should be carried out.
4. System design – once the heat loss has been estimated, a heat pump can be selected, and the new heating system designed.
5. Planning check – most heat pumps are likely to be classified as permitted development, however planning checks may be necessary in some situations.
6. System installation & commissioning – the system may now be installed and commissioned.

Various components of older electricity supplies like this one may be below the 80A service capacity that is currently offered by National Grid Electricity Distribution. For smaller homes this may not prevent installation of a heat pump, depending on what other electrical loads are in the home. For larger homes the supply may need to be upgraded before a heat pump can be installed, and this work should be done well in advance of a boiler failing. (Image source: Energy Networks Association)

What we are already doing

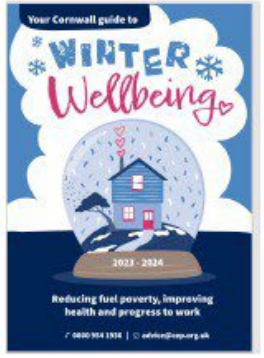
CORNWALL HOUSING





CORNWALL COUNCIL | Healthy Cornwall

Public Health England



citizens advice

Some of our partners and community groups

Cornwall Climate Action Network

COMMUNITY ENERGY PLUS

Community Area Partnerships

Sustainable Construction Advisory Panel (SCAP)

Winter Wellbeing

South West NET ZERO HUB

lendology·cic

CORNWALL & ISLES OF SCILLY LOCAL AREA ENERGY PLAN

6.0

Road map

Target Outcome

Provide the roadmap and pathways to eliminating emissions produced through heating and hot water provision in Cornish homes while reducing running costs and improving quality

Bringing together the actions from each section to suggest the next steps that could be taken by Cornwall Council and by private organisations and individuals.

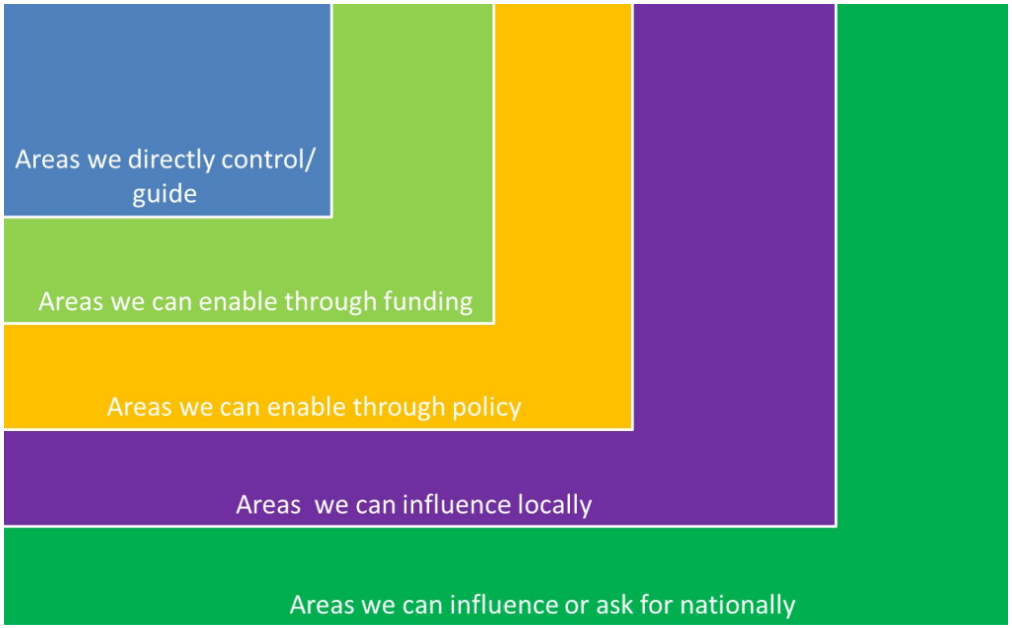
This section should be read in conjunction with Appendix 6

Suggested next steps

This housing decarbonisation strategy for Cornwall has identified twelve actions that could be taken by Cornwall Council to enable decarbonisation of existing homes. The actions are summarised below.

The first four actions are specifically required to deliver a tipping point in heat pump installations. Beyond this point it should become common knowledge that heat pumps are the current go-to replacement heating system for emission reductions, warmth, and affordability. This will lock-in decarbonisation as the new status-quo:

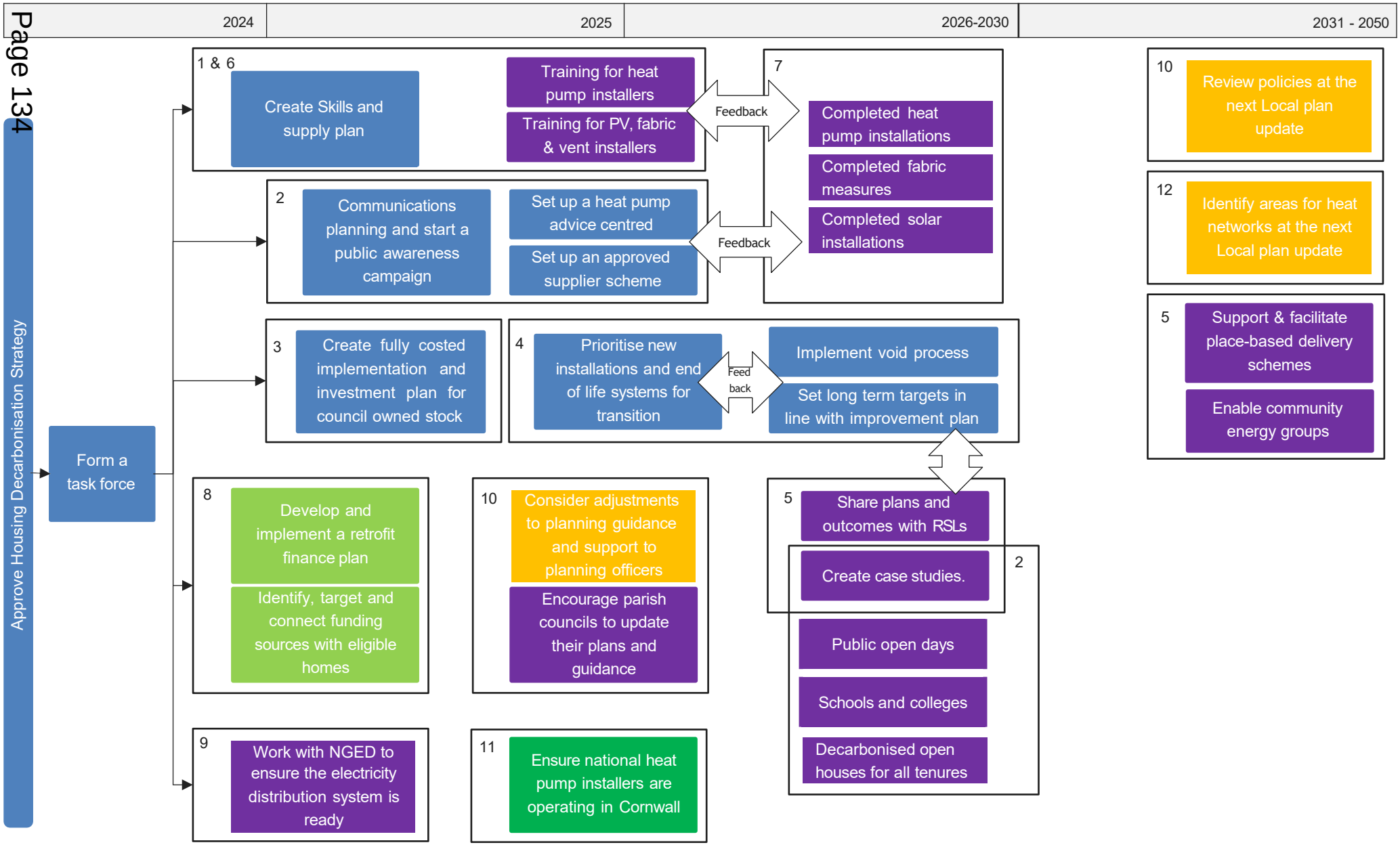
1. Facilitate training for heat pump installers
2. Public education campaign on heat pumps, heat pump readiness, fabric retrofit and solar photovoltaics.
3. Highlight the importance of decarbonisation for Council homes
4. Set long term carbon neutral targets for Council homes
5. Work with all tenure groups
6. Facilitate training for building fabric efficiency and ventilation
7. Close the feedback loop on heat pumps and fabric retrofit
8. Actively identify, target and connect funding sources with eligible homes and prioritise funding to those in greatest need
9. Work with National Grid Electricity Distribution to align their investment plans with this strategy, and co-ordinate street and neighbourhood level distribution system upgrades.
10. Implement frictionless planning policy for heat pumps and building fabric retrofit
11. Work with national heat pump installers to ensure Cornwall is not left out and is provided with adequate support services
12. Identify areas for heat networks



Cornwall Council's original Climate Change Action Plan introduced the concept of 'spheres of influence' to describe areas the Council can directly control, versus those that can be enabled or influenced. This is a helpful framework, which has been used to inform the roadmap outlined in this section. © Cornwall Council

Road map

Key: Direct actions | Enable with funding | Enable with policy | Local influence | National influence



Glossary

Heat Pumps: An efficient form of low carbon heating that extracts ambient heat from the environment to provide space and/or water heating'. See appendices for examples.

Airtightness or air permeability rate: A measure of how much air naturally leaks out of or into a building, through gaps around doors, windows, cracks, etc. Usually measured in $m^3/m^2/hr$ @50Pa.

Building fabric: A term used to describe collectively the walls, roof, floor, windows and doors and junctions of a building.

Carbon budgets: A term used to qualify the remaining carbon emissions, or share of carbon emissions, that can be emitted before the amount of cumulative emissions exceeds a climate change target.

Carbon footprint: The amount of carbon emitted by a person or organisation in a given timeframe.

Carbon offsets: A way of balancing emissions in one area by reducing emissions in another or through carbon sequestration.

Climate resilience: Enabling a building, dwelling, geographical area or organisation to adapt to the changing climate.

CO_2: Carbon dioxide, a greenhouse gas.

Coefficient of Performance (CoP): A measure of efficiency usually used for heat pumps. The CoP is the amount of useful energy (heating or cooling) produced from every unit electricity used. See appendices for more information and discussion on how seasonal efficiencies (SCoP) figures are estimated.

Energy efficiency: The relative amount of energy a building or system uses to achieve a certain aim (e.g. maintain a specific internal temperature).

Building fabric efficiency: A measure of how effective a building's fabric is at retaining heat.

kWh: Kilowatt hour, a measure of the amount of energy used or generated in one hour.

LETI: the low energy transformation initiative - a voluntary network of over 1,000 built environment professionals, working together to clarify what net zero carbon means in the built environment

Mechanical Ventilation with Heat Recovery (MVHR): A type of ventilation system that recovers heat from extracted air before it is vented outside the building and uses it to warm incoming fresh air.

Renewable energy: Energy produced from a renewable source e.g. wind or solar.

Retrofit: The introduction of new materials, products and technologies into an existing building to reduce its energy use and/or increase its renewable energy generation and/or reduce its carbon emissions.

Space heating demand: The amount of heat energy required to heat a space to the required temperature. Space heating demand is a good proxy for the building fabric efficiency and is usually expressed in $kWh/m^2/yr$.

Solar photovoltaic (PV): A form of renewable electricity generation from solar energy well suited to buildings and urban environments.

Thermal bridge: A point, line or area in a building's external envelope which loses more heat than its surroundings, i.e. a weak point from a heat transfer point of view.

U-value: The metric used to quantify the rate of heat loss for different elements. The higher the U-value, the more heat the element will lose.

Waste Water Heat Recovery (WWHR): A proprietary system which uses heat from waste-water and transfers it to the incoming cold water.

Our vision

- Green house gas emissions from our homes do not negatively impact the environment
- Homes are well insulated and have low carbon heating systems supported by renewable technology
- Homes are affordable to heat, and no one has to choose between heating and eating
- Our homes promote a healthy lifestyle and enable us to thrive
- There is a solution for all, and no one gets left behind

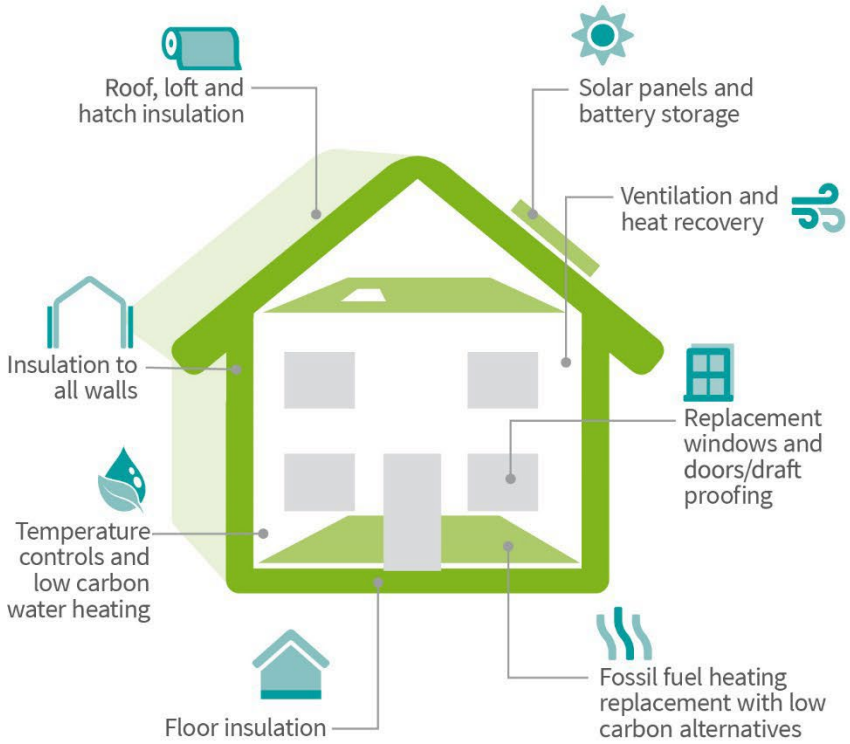
If you have any questions or comments email:
HousingDecarbonisation@cornwall.gov.uk

CORNWALL COUNCIL
one and all • onen hag oll
Etude

Cornwall Housing Decarbonisation Strategy

Appendices

July 2024 | Rev G



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Etude

Contents

Introduction

The appendices expand on aspects of, and should be read in conjunction with, the main report.

They give additional context on how and why the strategy has been developed and offer greater detail on some of the technologies and measures discussed in the main document.

The appendices are split into 6 sections:

1. General Context explains complexities around scaling international carbon budgets to regions like Cornwall, and why it is sensible to plan housing decarbonisation around a smaller carbon budget than is implied by the UK's current national carbon budget. It also considers why a housing decarbonisation strategy is necessary.

2. Technical Context & Solutions introduces a range of specific technical characteristics of Cornwall's climate and housing stock that are relevant to housing decarbonisation. It also explores the various technical measures that can be used to decarbonise housing. A subsection on Retrofit Planning explains approaches and considerations for retrofit planning at different scales, from individual homes to whole neighbourhoods, while another subsection on Decarbonisation Pathways develops the generic planning approaches into specific strategies for Cornwall's housing stock

3. Capital costs and Funding considers the costs for a case study decarbonisation pathway and reviews the wider issues around funding for decarbonisation. A subsection on Operating Costs explores how heat pumps can cost significantly less to operate than oil or gas boilers.

4. Supply Chain discusses the main barriers to decarbonisation and how these could be addressed to scale solutions at the pace required to deliver within carbon budgets.

5. Raising Awareness summarises current public awareness around technologies, policies and processes required to decarbonise housing and considers how these may need to change.

6. Road map sets out the next steps for the council and others to take to move forward from the decarbonisation strategy to implementation.

Glossary

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Appendix 1

General context

This section gives additional general context on the need for decarbonisation.

Carbon Budgets

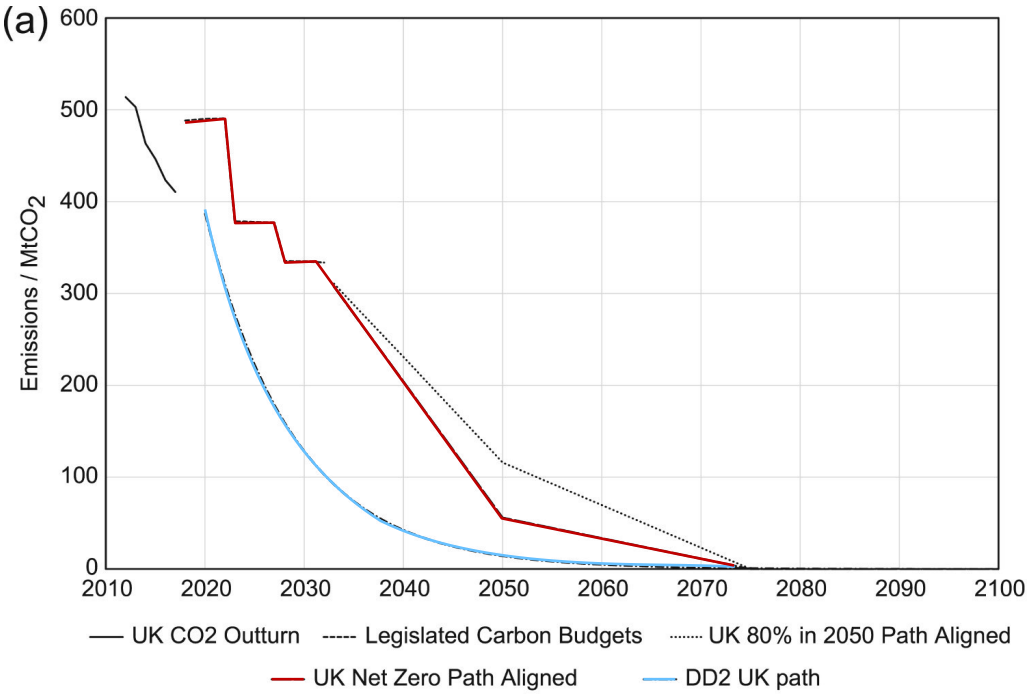
Introduction

Understanding carbon budgets is critical to making strategic decisions around how to decarbonise housing, yet the complexities of scaling global carbon budgets to a regional level mean additional context is necessary to make informed decisions. This page provides further explanation of how the UK's carbon budget has been developed and why it may be overestimated.

The UK's carbon budgets

The Climate Change Committee originally developed a set of carbon budgets to guide the UK toward an 80% emission reduction below 1990 levels by 2050. From 2019, the sixth carbon budget and beyond were designed to achieve a net zero carbon position by 2050, however independent studies have indicated that the UK's carbon budgets are likely to be overly generous, for several reasons:

1. UK carbon budgets assume quite large scale use of negative emission technologies that are currently not commercially viable. Budgets become much smaller if these are removed.
2. International aviation and shipping are excluded from UK carbon budgets. The CCC acknowledge this is an issue that must be resolved before 2050.
3. UK carbon budgets appear to relate to an uncomfortably low level of certainty of meeting a 1.5°C temperature threshold, when compared to the IPCC and other sources.
4. UK carbon budgets do not apply the equity principle of the Paris Agreement, which is fundamental element of this international agreement.
5. UK carbon budgets include internationally traded carbon units (reductions and cap and trade). Evidence from existing schemes suggests these are often ineffective at delivering the promised emission reductions.



UK energy only emission reduction pathways for different policy frameworks indicate large differences in overall carbon budget remaining until 2050. The Climate Change Committee's net zero pathway is based on a 7,700Mt carbon budget between 2020 and 2050, whereas the DD2 pathway, which is based on a Paris Agreement aligned carbon budget with lower reliance on negative emission technologies, is expected to be half this at 3,700Mt, requiring significant cuts to emissions by 2030. This implies an emission reduction pathway that is even more ambitious than the IPCC P1 pathway that is used in this report.

© Anderson et al. (2019) A factor of two: how the mitigation plans of 'climate progressive' nations fall far short of Paris-compliant pathways.

Decarbonisation Pathways

A pathway to decarbonise within carbon budgets

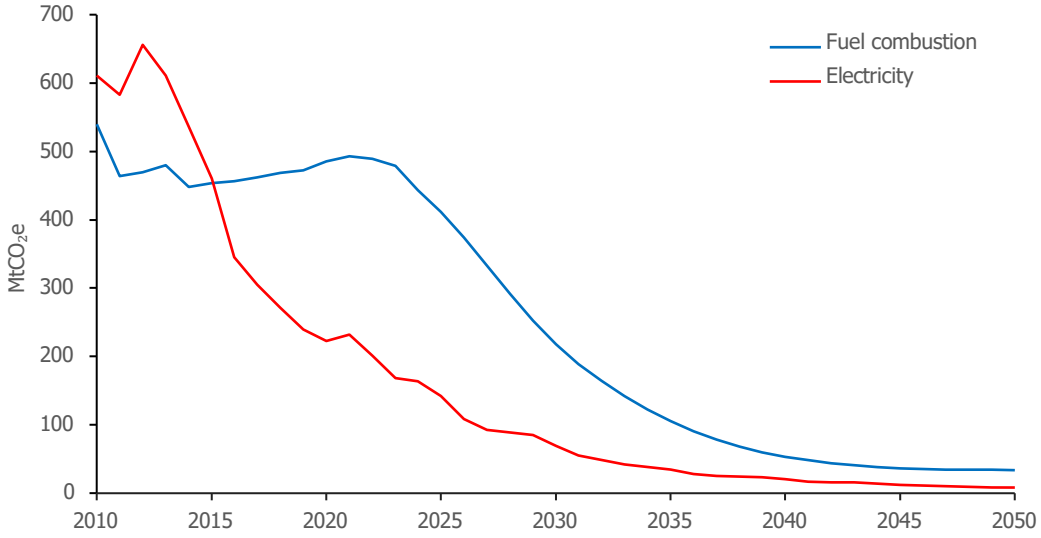
To understand the rate of decarbonisation that is required in homes across Cornwall to remain within a 1.5°C carbon budget, we have modelled a range of scenarios. These used the University of Exeter's emissions for electricity and fuel combustion from housing between 2010 and 2021.

From 2022, emissions were modelled by assuming typical levels of electricity and space heating demand per dwelling and applying the relevant emission factors to different heating fuels. Future grid emission factors use HM Treasury Green Book Average values, while emission factors from fossil fuels are assumed to remain the same over time.

This modelling indicates that by 2030, emissions from electricity use across homes in Cornwall will be 89% lower than they were in 2010. While this relies on ongoing decarbonisation of the electricity grid to achieve an emission factor of just 52gCO_2/kWh by 2030, it is expected to be plausible given historic progress in this area and assumed roll-out of commercially mature technologies such as wind and solar.

By 2030, emissions from fuel combustion within homes can be reduced by approximately 58% if around 55% of fossil fuel heating systems are replaced with heat pumps. From 2025-2027, sufficient deployment could be achieved just by replacing end of life boilers with heat pumps, however from the late 2020's to early 2030's, heat pump installation rates would need to exceed natural replacement rates to remain within the carbon budget.

The modelling assumes a gradual improvement in fabric efficiency to reduce space heating demand by 12% from 2025 to 2050. While this does not have a significant impact on emissions once heating has been decarbonised, it is an important part of improving the quality of the housing stock and realising other co-benefits.



Decarbonisation pathways for electricity and fuel combustion associated with Cornwall's housing stock. Achieving the levels of emission reductions required to remain within a 1.5°C carbon budget, based on the IPCC's P1 pathway, appear to be feasible. The P1 pathway is similar to the C1 pathway from the more recent IPCC AR6 mitigation report. While emissions from electricity fall more rapidly than is required to achieve a 58% reduction from 2010 levels by 2030, these savings are likely to be required to balance out slower emission reductions from other harder to treat sectors, not included in this report.

Why a decarbonisation strategy is required

Regulatory framework

Improving the energy efficiency of existing homes, moving away from gas boilers and installing solar PVs to generate electricity are not sufficiently supported by the current regulatory framework. In particular, it does not encourage enough whole house retrofit and heat decarbonisation and does not capture all opportunities or trigger points.

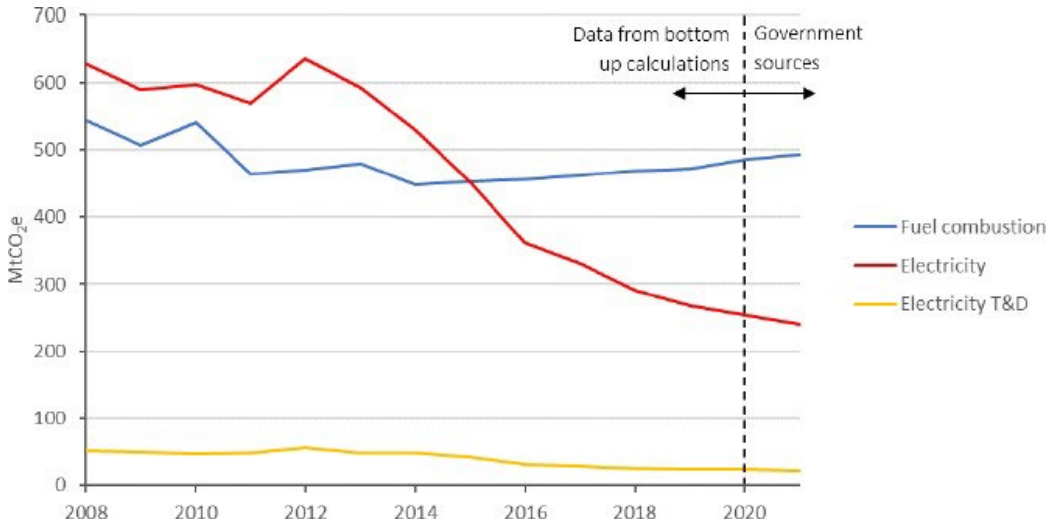
There is also no consistent and coordinated funding that covers all elements of the puzzle: fabric, heat source and renewable energy generation.

Supporting initiatives, while welcome, are still of a very small scale, and they often support individual measures rather than a whole-house approach. They have not yet reached the tens of thousands of homes required to start really building capacity.

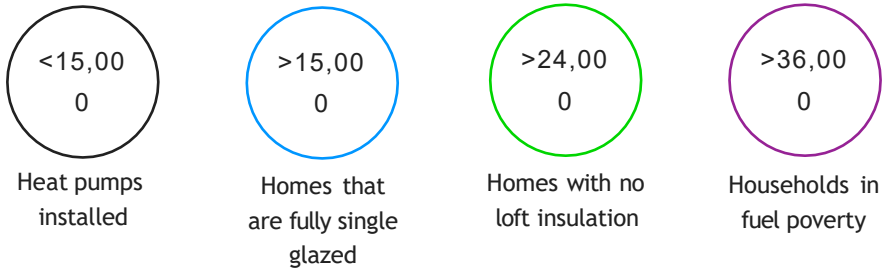
Not enough retrofits in Cornwall, and not low carbon enough

As a result, there are not enough retrofits happening and their impact is very variable. Crucially, this does not support the required upscaling and upskilling of supply chains, nor does it realise the job creation and retention potential a full retrofit programme could deliver.

If Cornwall were to wait for a sufficiently ambitious national frameworks to be put in place, it is likely that a large portion of its carbon budget would be used. Action is required now.



Greenhouse gas emissions from housing in Cornwall have reduced overall due to decarbonisation of the electricity grid but emissions from fossil fuel combustion are increasing, suggesting little retrofit improvement is being carried out (University of Exeter. "Reducing greenhouse gas emissions from housing in Cornwall" report, 2023).



Key statistics for retrofit in Cornwall. Data from Parity 'Cornwall Council: Pathways Report', February 2024 and from DESNZ published data

Residents survey results

Retrofitting Cornwall's homes is crucial

According to a recent survey of Cornwall residents[1], the majority of respondents – over 60% - are 'very concerned' or 'extremely concerned' about climate change. More than 73% of respondents believe that addressing climate change requires a high or extremely high level of urgency. In the same survey, nearly two-thirds of participants indicated they are either 'very worried' or 'extremely worried' about recent rises in the cost of living.

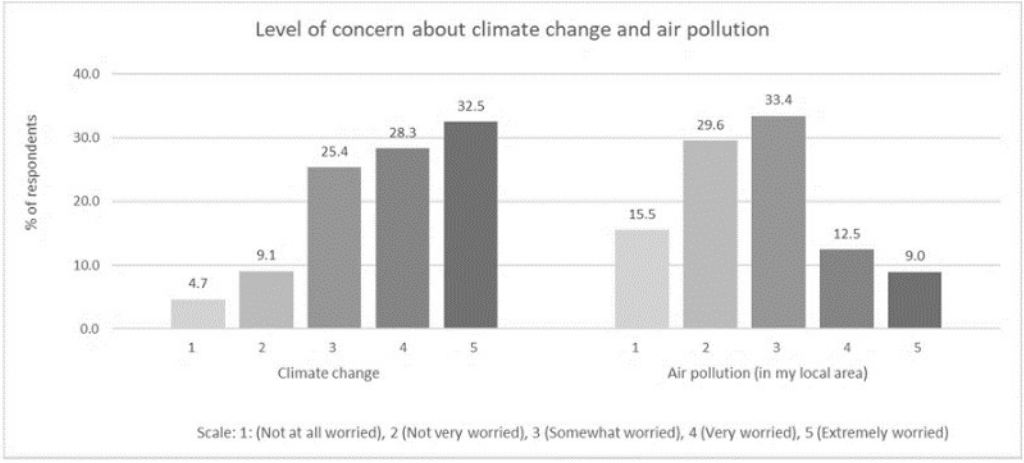
In order to respond to their concerns, retrofitting Cornwall's homes is crucial. Fossil fuel heating needs to be phased out, homes need to become more energy efficient, and they should contribute to the generation of solar renewable electricity.

A daunting challenge, which we should address together

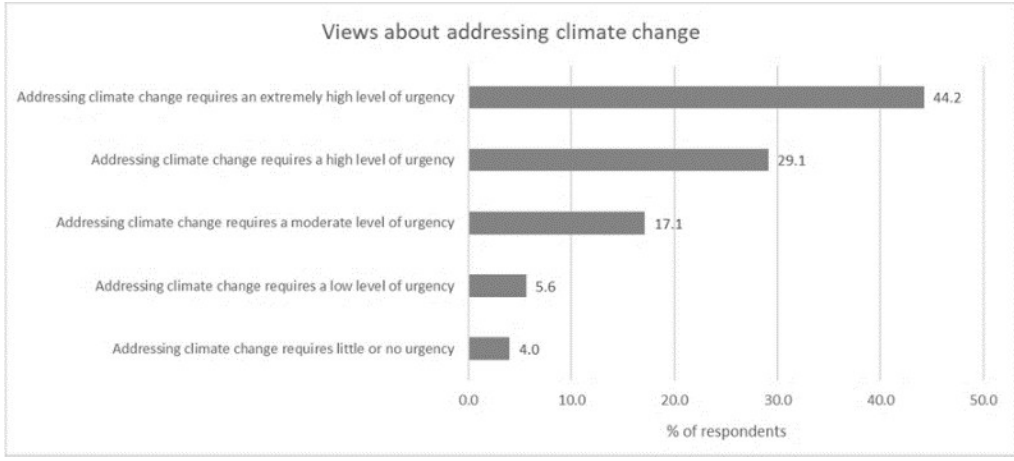
Each house and block of flats is different, and tenure is also a key consideration. And the retrofit challenge is happening at a time of huge pressure on local authorities (e.g. limited budgets, building safety, etc.).

Not knowing where to start, we may not retrofit our homes as the challenge seems too complex. It is not: this Housing Decarbonisation Strategy for Cornwall is aiming to make it simpler and address the different issues, one by one and to also articulate the actions needed.

The aim of this project is to determine the most effective suite of retrofitting measures to achieve a radical reduction in carbon emissions and a suite of other complementary targets. The strategy looks forward to the ultimate aim of achieving Net Zero by 2050 at the very latest.



Participants' level of concern about climate change and localised air pollution. Source CAST study 2023



Participants' perceived level of urgency to address climate change. Source CAST study 2023

[1]*Cornwall Council behaviour change and engagement programme – survey of residents, CAST 2023*

Appendix 2.0

Technical context for Cornwall

This section describes the specific technical constraints and opportunities that affect homes in Cornwall.

Climate

General Climate

Cornwall has relatively mild winters, which means that for an equivalent level of building fabric performance there is less heat loss than in other parts of the UK. Air source heat pumps can also be expected to operate at higher efficiencies due to warmer outdoor temperatures, reducing energy use for both space and water heating.

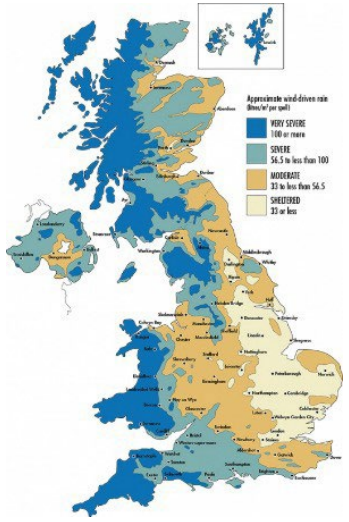
Exposed coastal regions will experience higher levels of salt exposure, which can cause accelerated corrosion of air source heat pumps unless special anti-corrosion treatments are applied.

Rainfall

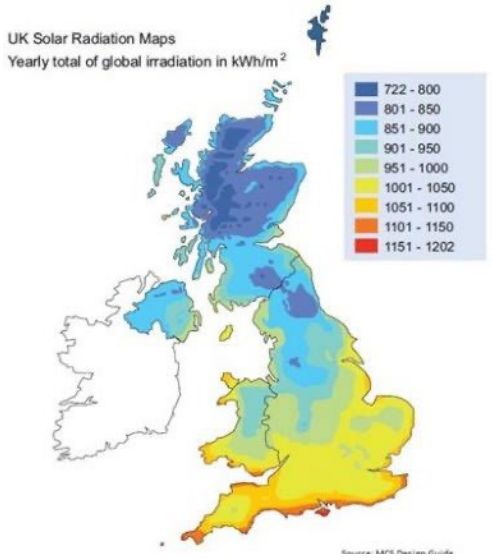
Cornwall has a high severity rating for wind driven rain, which means a higher amount of rainfall coinciding with periods of high wind velocity. Exposed building surfaces may be expected to receive a high volume of rain as a result, even with horizontal shelter measures in place. This has implications for both the scheduling of works, which may not be possible during extended periods of bad weather, and also the way in which fabric efficiency measures are applied. Fully insulating cavity walls, for example, without fitting an external rainscreen to create a secondary ventilated cavity would likely result in high risk of moisture issues.

Solar Irradiation

Cornwall has some of the highest rates of solar irradiation in the UK. This further reduces space heating demand in buildings as useful solar heat gains are increased. Electricity generation from solar photovoltaic systems is also relatively high, which reduces the levelised cost of electricity from solar panels, providing a useful form of low cost electricity for much of the year that is particularly well suited to homes with heat pumps. Even within Cornwall, irradiation can vary a noticeable amount depending on location.



Cornwall sits within a very severe exposure class for wind driven rain. © BRE, BR 262



Solar irradiation in Cornwall is some of the highest in the UK. © MCS

Radon

Radon

Radon is a colourless, odourless radioactive gas formed by the radioactive decay of the small amounts of uranium that occur naturally in all rocks and soils. It is associated with some health risks, particularly lung cancer.

Radon and retrofit

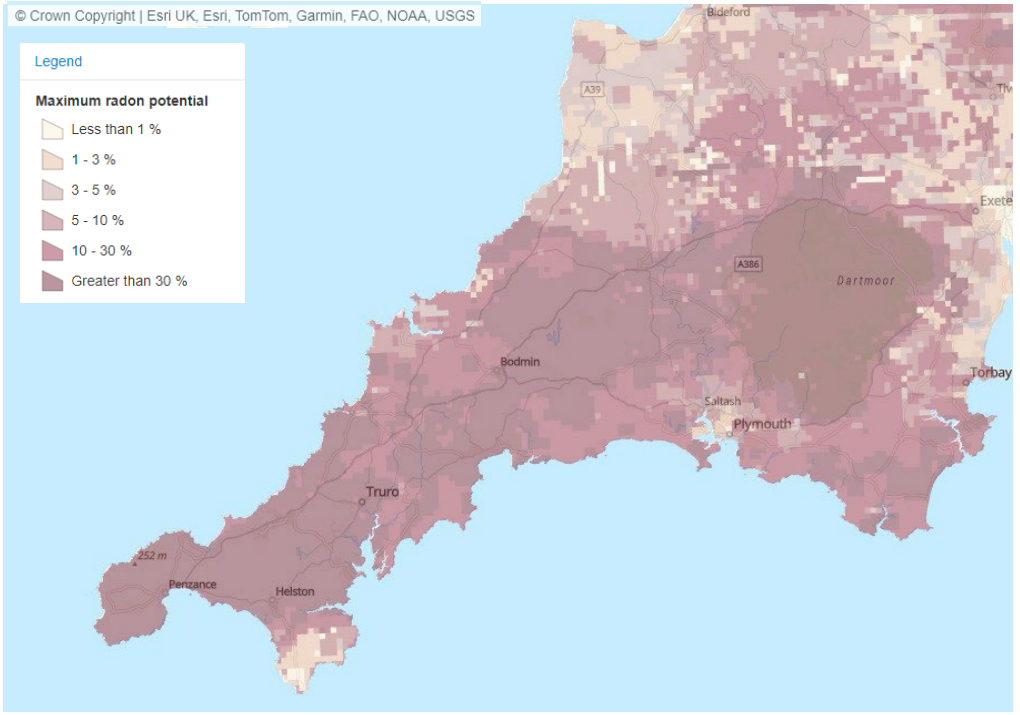
Reducing infiltration, (that is accidental ventilation through gaps and cracks in buildings), is a key part of improving energy efficiency and making homes more comfortable. It is essential that adequate ventilation, (that is a system designed to ensure good air flow in all areas of the house), is part of retrofit, to control moisture and also to improve indoor air quality. This will also reduce the build-up of indoor air pollutants, including radon. However, the radon risk is a specific issue in Cornwall that may require additional measures, such as radon sumps, introduction of radon barriers or supplementary ventilation.

UK Health Security Agency advice

The UKHSA publishes information on how to manage and mitigate radon risk in houses. The starting point is a risk report. Where there is a significant risk (which is generally the case in Cornwall), a survey to measure the radon in the house is a simple test. The concentration of radon found determines the measures that should be taken (see decision tree diagram, right).

Positive ventilation pressures

One of the remedial methods proposed is ‘positive ventilation’ for lower levels of radon. This can be achieved through either positive input ventilation systems, or intentionally unbalanced mechanical ventilation systems with heat recovery. Refer to Technical solutions section for more information on energy efficient ventilation strategies.



Cornwall has a high radon risk throughout the county. © UKHSA, UK maps of radon

Floor type	Solid		Suspended	
Radon level* **(Bq m^{-3})**	Under 500	Over 500	Under 500	Over 500
Recommended solutions, best first	Radon sump or Positive ventilation	Radon sump	Natural under-floor ventilation or Positive ventilation	Mechanical under-floor ventialtion or Natural under-floor ventilation

For houses with mixed floor types, a combination of the above can be used.

*The level of 500 Bq m^{-3} is an approximate guide.

Remedial methods for homes with high radon levels. © UK Radon

Mundic and System Builds

Buildings that use traditional construction materials – stone, brick and timber - can last for centuries. Since the middle of the 20th century, other techniques have been used, primarily aimed at saving time, money or both. Many homes have been built using manufactured materials using waste or prefabrication systems. Some of these buildings and products are now beyond their designed life span. The approach to decarbonisation of such properties needs to consider the structural condition and potential longevity of the retrofitted property.

Mundic

Concrete blocks which used aggregates derived from waste products of mining have been found to deteriorate over time as a result of the mineral constituents of the aggregate. Cornwall Council have published a comprehensive guide on how to assess whether a house built using this type of block is suffering mundic decay.

Prefabrication System Builds

Cornish Units and Woolaway and Reema construction systems along with some other similar systems have been used for thousands of homes in Cornwall. Buildings using these systems have suffered structural failure and they also may contain asbestos.

Decarbonisation Approach

These homes need to be decarbonized, but the extent of investment in fabric upgrades should be moderated by understanding their structural condition and projected remaining life. In the case of potential mundic homes, the class of material will dictate the most suitable approach.

In many cases, the approach may be to install heat pump and plan to demolish at a later date. Care will be needed to design the heating to be efficient to avoid increasing running costs for residents, potentially including upgrades to heat emitters.

Woolaway homes.
This type of construction has been classified as defective by the Secretary of state unless repaired and certified under an approved scheme (image source: Non Standard House Construction)

Reema hollow panel homes (image source: Non Standard House Construction)

Row of Cornish Unit Type 1 homes (image source: Non Standard House Construction)

Heritage

Conservation areas and listed buildings in Cornwall

Cornwall has the largest number of statutorily protected heritage assets in the UK including 12,552 Listed buildings and 145 Conservation Areas. The key challenge of implementing domestic retrofit at scale within conservation areas is balancing conservation objectives with management of sustainability-led change. There are many ways that traditional buildings can be upgraded without damaging their character

Aesthetic sensitivities

The visitor economy is hugely important to the county and measures that could affect the visual appeal of communities could detrimentally affect the area's economy.

Particular issues to local vernacular construction.

Stone built walls and slate hung timber frames need careful attention to moisture risks in the wet, windy climate. Older slate roofs may be fragile, so access for the installation of PV may not be possible but other solutions such as ground mounted PVs or siting on outbuildings could be.

Small communities with densely built town centres

Characteristically small towns and larger villages have very densely built centres with small properties built very close together, with very restricted private outside space, making the siting of heat pumps a particular challenge.

Rural and agricultural buildings

Rural buildings can be large and with multiple extensions and alterations that make a single retrofit approach difficult to identify, introducing a degree of complexity that can be challenging to understand for many owners.

One size doesn't fit all

Some towns have been centres of habitation for centuries and the buildings reflect the progressive, successive development. There is no 'one size fits all' solution to upgrading energy efficiency. An holistic assessment is needed.

Town centres with densely built buildings of different ages and construction (image source: cornwalls.co.uk)

Rural properties with multiple phases of construction (image source: cornwalllive.com)

Appendix 2.1

Technical Solutions:

Heat Sources

This section explains the considerations around the potential heat sources

Low Carbon Heating | Air-Air Heat Pumps

Overview

Air to air heat pumps, often marketed as 'mini-split air conditioners' offer one of the lowest cost entry points to low carbon heating*. They are common across much of Europe and dominate heat pump sales in many other countries due to their simplicity, low cost, and ability to offer cooling as well as heating.

Space Heating and Cooling

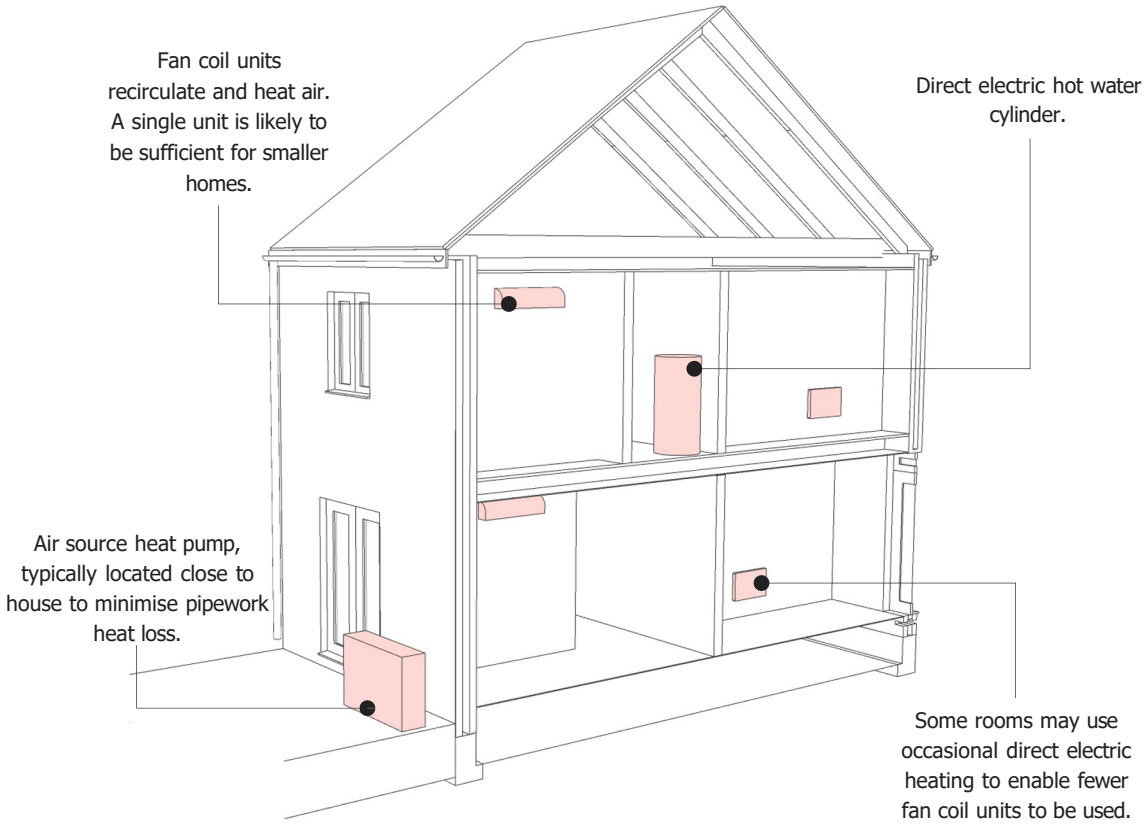
Air to air heat pumps recirculate air within a room, heating or cooling it via a fan coil unit that is often mounted high up a wall. Ceiling cassettes and low-mount fan coil units that are similar to conventional radiators are also available. Many homes will only need one or two fan coil units to heat all rooms in the house. A small amount of direct electric heating may be useful for remote rooms.

The ability of air to air heat pumps to cool as well as heat air means they are particularly useful for properties that have vulnerable occupants or high risk of overheating. Air to air heat pumps are also very responsive, meaning that they can quickly heat or cool a space due to the high air flow rates that are possible.

Water Heating

As air to air heat pumps do not usually provide water heating, this must be provided separately. This can be achieved through a direct electric water heating cylinder, or a dedicated heat pump water heater, either of which ideally would be programmed to use off-peak tariffs or solar electricity.

*Air to air heat pump hardware costs for a typical home are around £800-£1,200 plus installation and the cost of a direct electric hot water tank. Total installed costs are therefore around £2,500-£5,000 for a typical semi-detached home.



Key components of an air to air based approach to heating decarbonisation. Air to air heat pumps have an external condenser unit that uses a fan to gather heat from the outdoor air in the same way as an air to water heat pump. They do not usually provide water heating, so a separate water heating system is also required.

Low Carbon Heating | Air-Water Heat Pumps

Overview

Air to water heat pumps are currently one of the most common low carbon heating systems being installed in the UK. This is likely due to their suitability as a drop-in replacement for other heat sources that use a wet heat distribution system like radiators or underfloor heating. They are also popular across much of Europe, but less so than air-air heat pumps. The cost of installing an air to water heat pump is typically higher than air to air heat pumps*.

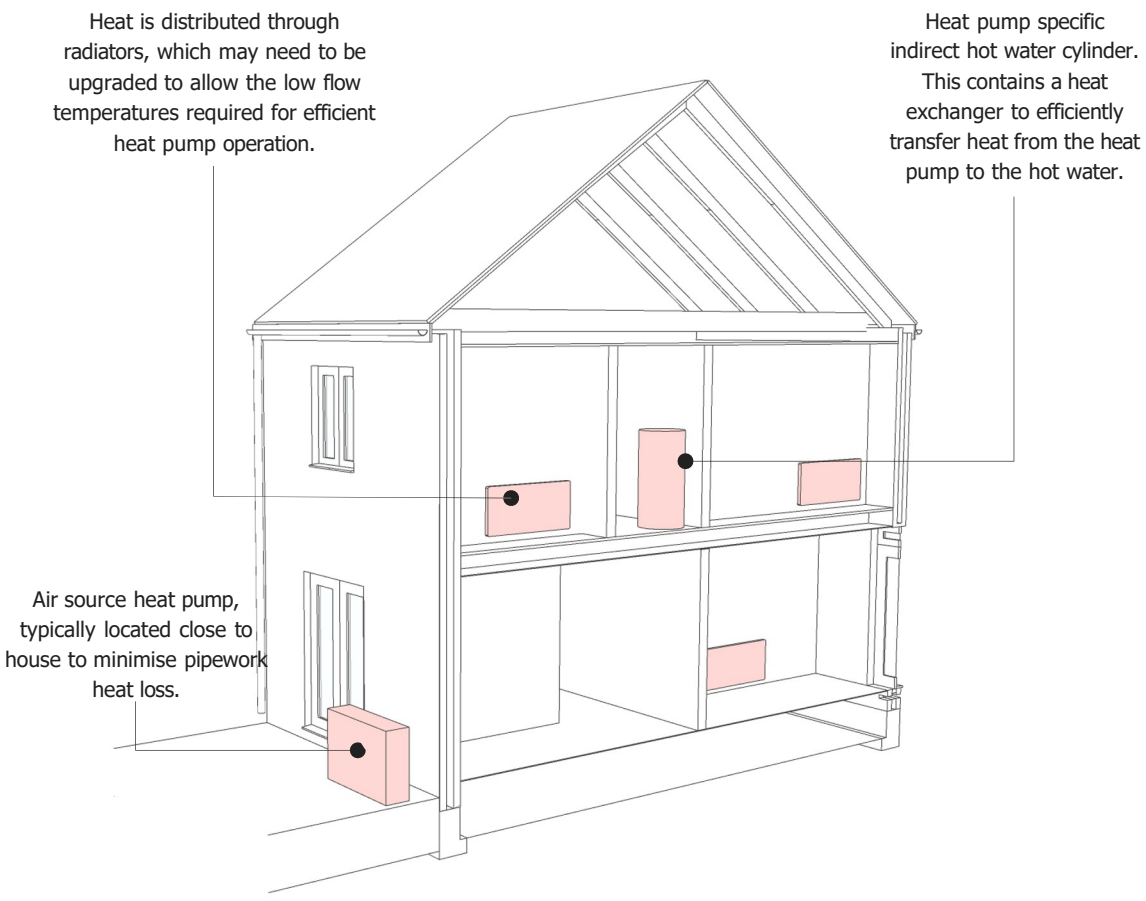
Space Heating and Cooling

Air to water heat pumps heat or cool water that may be used by any wet heat distribution system. Often, the existing radiators in a home may be used, with upgrades to larger, finned, and/or multiple skinned radiators where necessary to achieve the lower flow temperatures required for efficient operation. Air to water heat pumps may also be used with underfloor heating, which generally allows even lower flow temperatures than radiators due to its large heat emitter area.

Water Heating

Air to water heat pumps alternate between providing space heating and water heating, using a large hot water tank usually of 180-300 litres to store hot water. Ideally water heating is timed or controlled to occur using off-peak tariffs or solar electricity.

*Air to water heat pump costs for a typical semi-detached home are around £6,000-£13,000 including installation and the cost of some heat emitter upgrades. At the time of writing these costs may be offset against a £7,500 Boiler Upgrade Scheme grant for eligible properties, making them cheaper than replacement fossil fuel systems.



Key components of an air to water based approach to heating decarbonisation. Air to water heat pumps have an external condenser unit that uses a fan to gather heat from the outdoor air. The heat is transported into the home via a water or glycol based fluid where it is used to heat a hot water tank and wet heat emitter system such as radiators or underfloor heating.

Low Carbon Heating | Ground-Water Heat Pumps

Overview

Ground to water heat pumps are a mature, but currently less common, low carbon heating system in the UK. They are well suited to buildings where air source heat pumps are unsuitable, such as some blocks of flats or historic buildings. They also tend to have longer lifetimes as the heat pump is very robust and can be located inside. They are suitable as a drop-in replacement for other heat sources that use a wet heat distribution system like radiators or underfloor heating. The cost of installing a ground to water heat pump is typically higher than air to air and air to water heat pumps*.

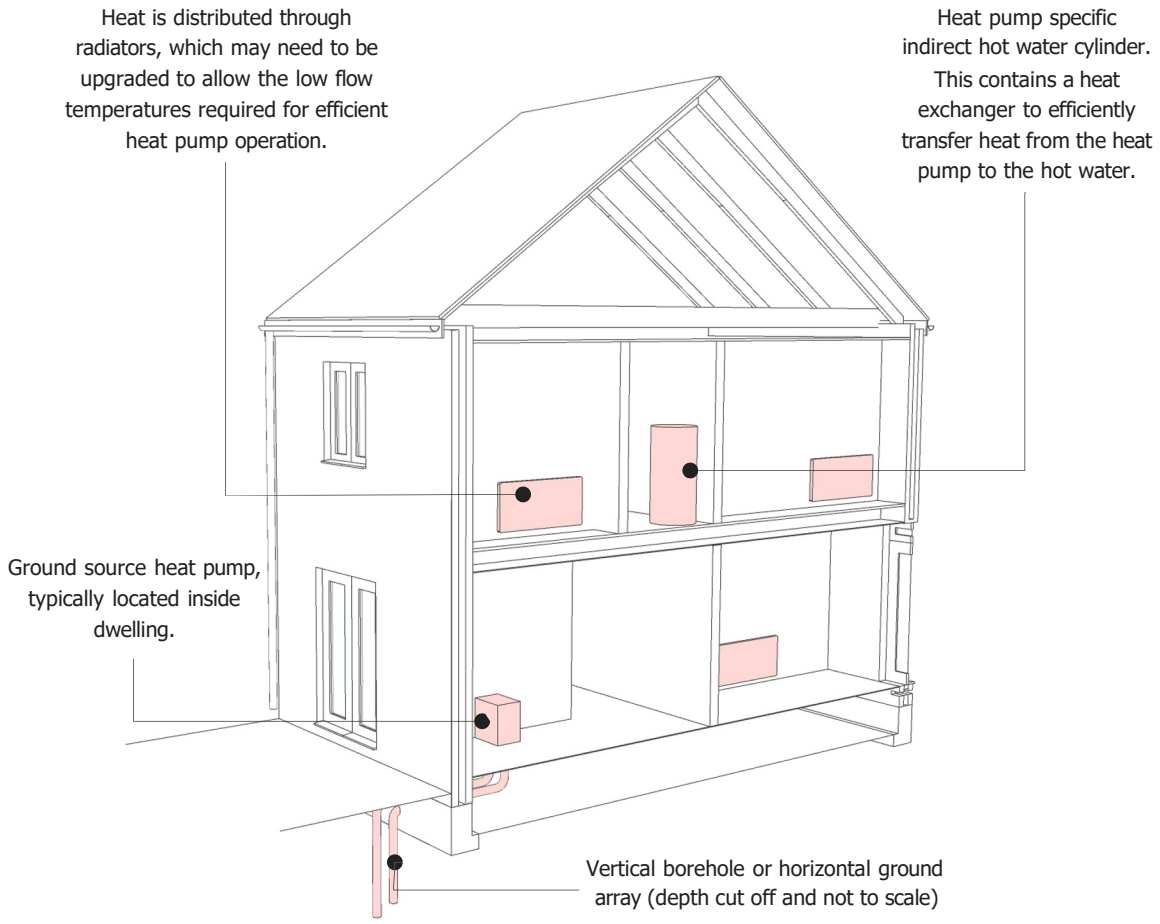
Space Heating and Cooling

Ground to water heat pumps heat or cool water that may be used by any wet heat distribution system. Often, the existing radiators in a home may be used, with upgrades to larger, finned, and/or multiple skinned radiators where necessary to achieve the lower flow temperatures required for efficient operation. Ground to water heat pumps may also be used with underfloor heating, which generally allows even lower flow temperatures than radiators due to its large heat emitter area.

Water Heating

Ground to water heat pumps alternate between providing space heating and water heating, using a large hot water tank usually of 180-300 litres to store hot water. Ideally water heating is timed or controlled to occur using off-peak tariffs or solar electricity.

*Ground to water heat pump hardware costs for a typical semi-detached home are around £5,500-£7,500 plus installation, the cost of a borehole at £4,000-£6,000 per 100m and the cost of some heat emitter upgrades. They are also currently eligible for the £7,500 Boiler Upgrade Scheme grant.



Key components of a ground to water based approach to heating decarbonisation. Ground to water heat pumps have a borehole or ground array that gathers heat from the ground via a glycol based fluid. Boreholes typically deliver around 4kW of heat per 100m of depth. Heat from the heat pump is used to heat a hot water tank and wet heat emitter system such as radiators or underfloor heating.

Low Carbon Heating | Heat Emitters for Heat Pumps

Overview

Air to water and ground to water heat pumps use a wet heat distribution system such as radiators or underfloor heating*. The lower the flow temperature through the heat emitters, the more efficiently a heat pump can operate.

The heat output of heat emitters also reduces as flow temperature falls. As most existing heat emitters were designed to be supplied with water from a boiler at around 60-70°C, they are often unable to provide sufficient heat output at lower temperatures required for efficient heat pump operation.

How to achieve low flow temperatures

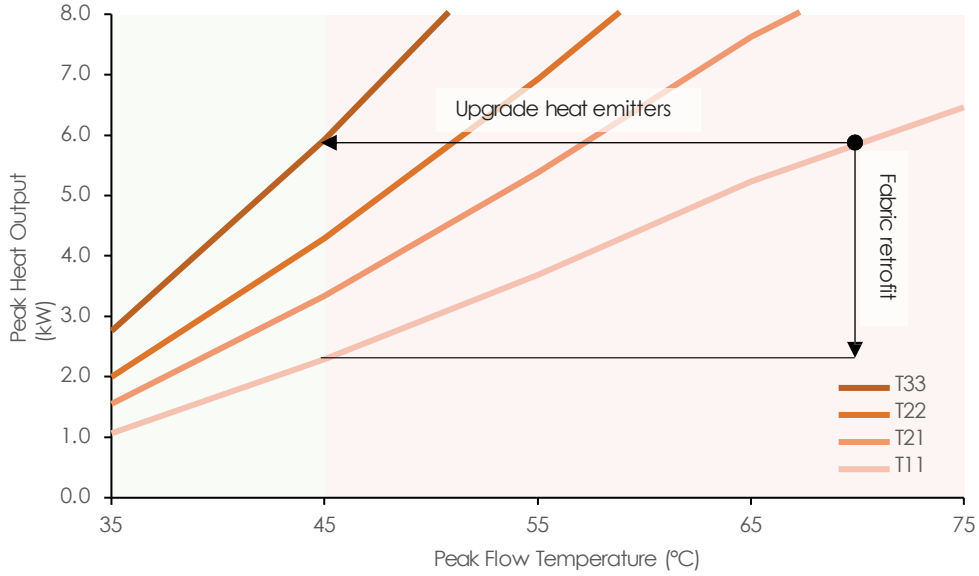
When installing a heat pump, this problem can be solved in two ways.

1. Upgrade the heat emitters - by adding more, increasing size, swapping radiators for ones with more panels and/or convectors, or using fan assisted radiators.
2. Reduce the peak heat demand, by insulating the house, improving airtightness, and/or using heat recovery ventilation.

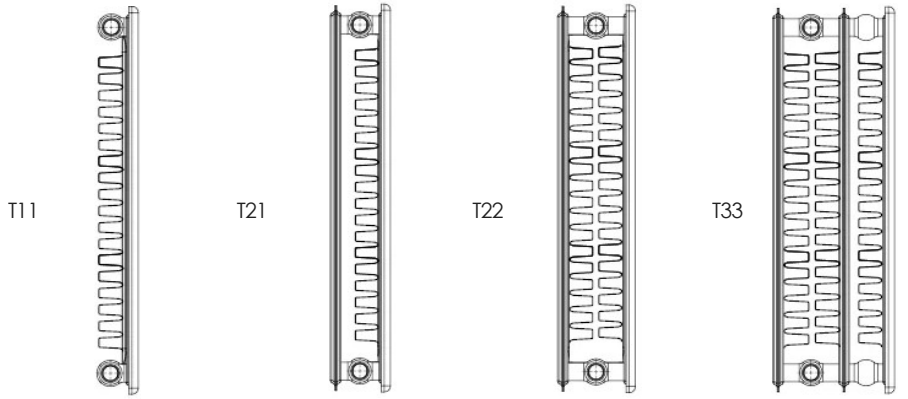
The adjacent graph illustrates these two approaches for a typical semi-detached house with a peak heat demand of around 6kW. The four coloured lines show the heat output for a set of typical panel radiators at different flow temperatures, with each line representing a different radiator type.

The horizontal arrow shows how changing from single to triple skin radiators could maintain the same level of heat output as flow temperatures are reduced from around 70°C to 45°C. The vertical arrow shows how the single skin radiators could be retained if peak heat demand can be reduced about 60%. In reality, a combination of both approaches will often be used, depending on the characteristics of the dwelling.

**Air-air heat pumps do not use wet heat emitters, they circulate refrigerant through a fan coil unit, and are factory-set to use low refrigerant flow temperatures, hence are typically very efficient.*



This graph illustrates the two pathways to achieve efficient operation of heat pumps using wet heat distribution systems. Low flow temperatures can be achieved either through increasing heat emitter area (by changing radiators for larger ones, or ones with more panels or convectors), or through fabric retrofit.



The four main types of steel panel radiator used in the graph above are classified based on the number of panels and convector sets present. For example, a Type 21 has two panels and one set of convectors (image source: Stelrad)

Low carbon heating | Heat pump examples

Deck mounted

Rear garden – ground mounted

Rear garden – ground mounted

Roof mounted

Bracket mounted

Boxed enclosure

Rear garden – ground mounted

Rear garden – ground mounted

Front garden – ground mounted

Wall mounted – wired enclosure

Wall mounted

Heat pump under a window and behind enclosure

(images sourced from: pumpchic.com)

Low Carbon Heating | Direct Electric Heating

Overview

Direct electric heating generally has low installation and maintenance costs*, and with decarbonisation of the electricity grid it is now a lower carbon option than fossil fuel heating. Due to the relatively high cost of electricity compared to oil and gas, direct electric heating is often expensive to run in all but the most efficient homes. Use of time of use tariffs combined with hot water tank timers and storage heaters can reduce costs, but not usually to the extent that could be achieved by a heat pump, which uses 70-80% less electricity.

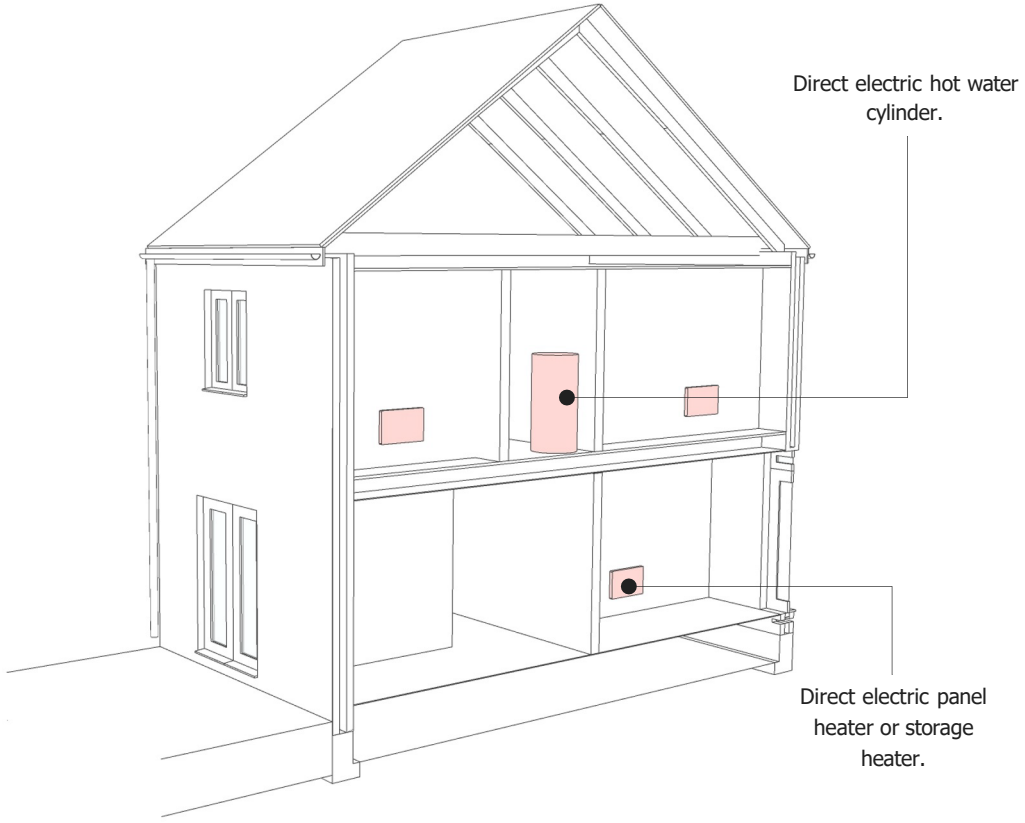
Space Heating

Space heating can be provided by electric panel heaters, storage heaters, or underfloor heating mats. Electric boilers can provide hot water to wet radiators or underfloor heating, however if a wet heat emitter system is already present, an air to water or ground to water heat pump is generally a much better option.

Water Heating

Water heating may be achieved through a direct electric water heating cylinder, or various forms of instantaneous heating such as electric showers, inline heaters or electric boilers. Instantaneous heaters generally use less energy as storage losses are reduced compared to using a tank, but create very high peak power demands and cannot charge using off-peak electricity.

*Direct electric space heating typically costs from £600 for basic panel heaters to £2,000 for storage heaters, plus installation. Adding in the cost for a direct electric hot water tank results in total installed costs of around £1,600-£3,000 for a typical semi-detached home. In many cases the modest additional costs of installing an air-air heat pump may pay for themselves within a year due to their lower operating costs.



Key components of a direct electric approach to heating decarbonisation. These systems are simple, with a direct hot water tank using an immersion heater, and electric panel radiators or storage heaters. In many cases, fitting air-air heat pumps to homes that already have direct electric heating could be a good strategy to reduce running costs and demand on the electricity grid.

Low Carbon Heating | Geothermal Heating

Overview

There are various ways in which geothermal energy can be harnessed. An approach currently being developed in Cornwall involves use of a pair of 5km deep wells. Water is pumped down an injection well into hot rocks within a natural fault zone, before being pumped back up a production well to a geothermal energy centre where it can be used for electricity generation or heating via a heat network.

Carbon emissions and cost

Carbon emissions from geothermal heating are likely to be very low, and limited to the electricity required to operate pumps required for the deep wells, heat network, and heat distribution within dwellings.

A key question surrounding the future viability of deep geothermal heating in Cornwall as a scalable low carbon heating solution is whether the operational costs can be competitive with the various forms of heat pump. The fixed infrastructure costs associated with district heating networks can be substantial and usually require high density housing with high heat loads (eg poorly insulated blocks of flats) to reduce the per unit costs for service connections and/or heat. Existing housing in Cornwall may have high heat loads but is often relatively low density.

Deep geothermal projects in Cornwall

Langarth Deep Geothermal Heat Network is the main project currently planned for Cornwall that involved heating housing at scale. It has been awarded £22m in funding from the governments Green Heat Network Fund. A 5,275m deep borehole is planned, to deliver heat to around 3,800 homes and public facilities at Langarth Garden Village. Geothermal Engineering Limited hopes to create a portfolio of geothermal energy projects across Cornwall, with sufficient capacity to heat 70,000 homes by 2028.

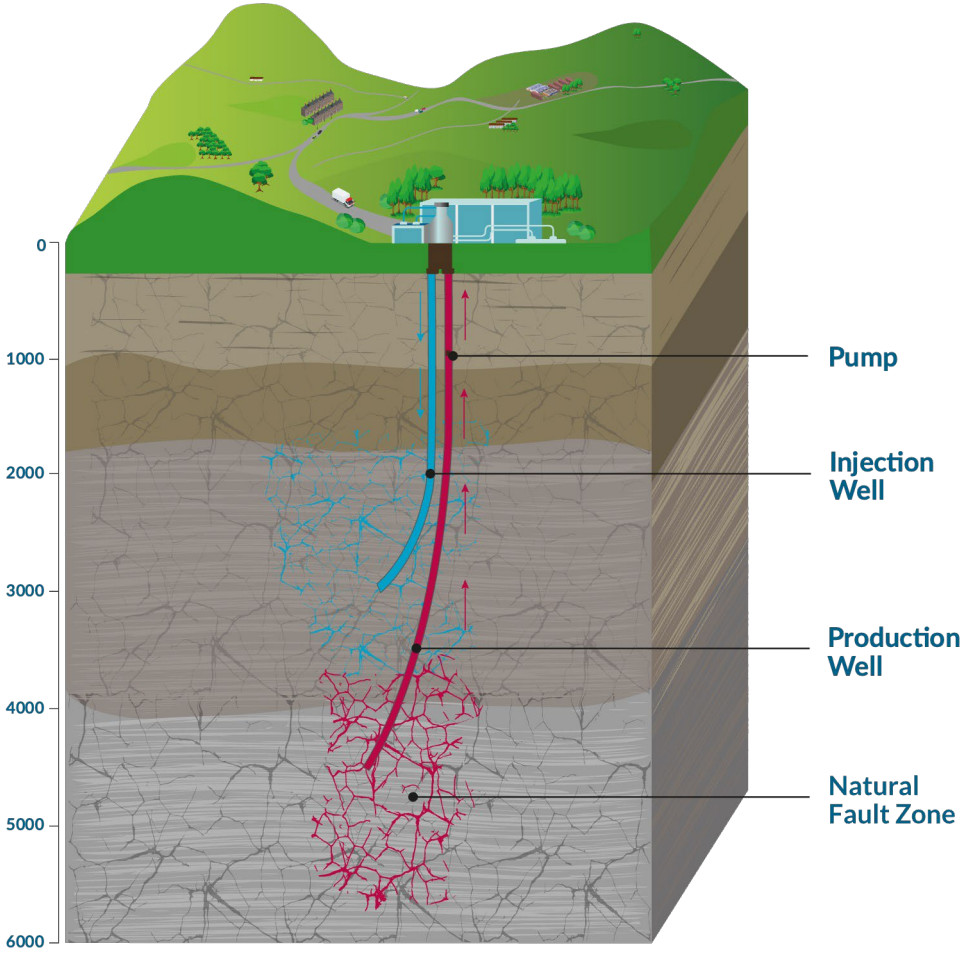


Diagram showing principles of operation for the geothermal energy centres planned for Cornwall. Heat distribution from the above ground energy centre to individual homes via a district heat network is not shown. (image source: Geothermal Engineering Limited)

Other Heat Sources | Biomass and Biogas

Overview

In their 2019 report on housing, the Climate Change Committee did not consider combustion of biomass in open fires a low carbon heat source nor did consider the use of biomass for heat to be the best long-term use of the UK's limited biomass resource.

This view was based on a 2018 paper published by the Committee, which considered the role for biomass in a low carbon economy. The report specifically recommended that support for use of biomass in buildings is limited to niche uses, while also minimising air quality impacts, for example by favouring use of biogas produced from anaerobic digestion over direct combustion of biomass. More generally, the report discourages larger scale combustion of biomass for heat or electricity generation unless paired with carbon capture and storage.

Anaerobic Digestion

This is a process where biomass is digested by bacteria in the absence of air to produce methane gas, which can then be burned to generate electricity or heat. Suitable feedstocks can include plants, manure, crop residues, food waste, paper, and wastewater.

The contribution this could make to the Cornwall's electricity requirements is likely to be very small.

Domestic Combustion

Direct combustion of woody biomass in homes to provide heat produces significant quantities of carbon dioxide and air pollution and should not be encouraged by policy.

Use of biogas produced by anaerobic digestion facilities, as a heating fuel can be expected to produce smaller amounts of air pollution. However, net carbon dioxide emissions can be complicated to determine, fuel production may cause other sustainability issues, and these are not scalable solutions.

Direct combustion of biomass in buildings to provide heat should not be encouraged due to carbon emissions and adverse impacts on air quality (image source: Pexels from Freerange Stock)

Typical anaerobic digestion facility. Biogas can be produced from waste and used to generate electricity. (image source: Renewable Energy Association)

Other Heat Sources | Liquid Biofuels

Overview

The Climate Change Committee have specifically stated that '*policies should assist a transition away from using biofuels in surface transport, biomass for heating buildings, or biomass for generating power without CCS*'. The sixth carbon budget further clarifies their position that '*assessment of the economy-wide best use of biomass indicates that use in buildings should be minimised as far as possible*'. The reasons for this in relation to liquid biofuels are explained below.

Biofuels need to be used in the right place

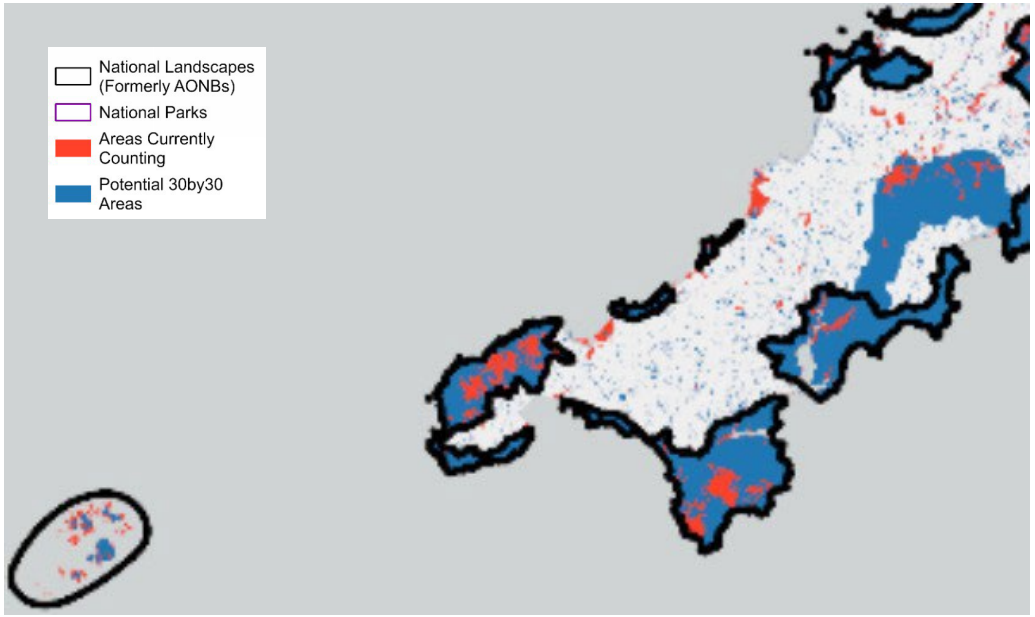
Whether or not use of liquid biofuels results in a net emission reduction depends on how the feedstock was produced, what the feedstock would have been used for had it not been used to produce biofuel, and what other uses the biofuel could be used for.

In the case of using biofuels to heat buildings that could be relatively easily decarbonised via heat pumps, in most cases this will result in a net increase in emissions as it reduces the already limited amount of biofuel that is available for harder to treat sectors such as aviation and shipping, where demand already exceeds available supply.

Scalability

The supply of sustainable feedstock for biofuels is limited. Waste products such as used cooking oil and animal fats are often already used for other industrial processes, and the entire volume of used cooking oil in the UK could only provide around 1.5% of aviation fuel requirements. Potential from perennial energy crops such as rapeseed oil is expected to be very limited given the government's commitment to protect and conserve 30% of land for biodiversity by 2030. Indicative mapping implies a significant net reduction in the amount of land subject to intensive agriculture.

The Climate Change Committee have indicated that even accounting for these other feedstocks, it would be 'stretching' for biofuels to provide 10% of aviation fuel requirements by 2050. This leaves no surplus available for heating buildings.



Indicative map showing how the UK's target to protect and conserve 30% of the UK's land by 2030 could be achieved in the South West. Strategies to deliver this could incentivise landowners to manage their land in ways that protect and restore biodiversity, rather than for the types of intensive agriculture that are required to produce energy crops to produce liquid biofuels (image source: DEFRA)

Could imports provide a solution?

Quantities of imported waste oil are very limited, they may be required for use within their country of origin, and as with UK sourced waste oils they are already required for harder to treat sectors. The use of imported soybean oil and palm oil is specifically being phased out by the EU due to concerns around deforestation and unsustainable land use change, which could increase emissions and cause biodiversity loss.

To minimise risk of use of unsustainable feedstocks, the EU's Renewable Energy Directives (II & III) and UK RTFO require independent certification of feedstocks, usually carried out by independent bodies such as the ISCC. However, these are subject to a paradox that the least stringent certification schemes are often the most popular. As an indication of the potential issues associated with imported biofuels, independently certified used cooking oil imports to the EU are currently subject of fraud investigations over allegations that they were actually rebranded virgin oils.

Other Heat Sources | Energy From Waste

Emissions from the St. Dennis Waste to Energy Plant

The St. Dennis waste to energy plant currently burns around 240,000 tonnes of waste a year. Assuming 700 – 1,700 kgCO_2 is emitted per tonne of waste, annual emissions could range from 168 - 408 ktCO_2, or 5-11% of Cornwall's emissions in 2020.

Reducing emissions from energy from waste

The implications of the Climate Change Committee's Balanced Net Zero Pathway for the St. Dennis energy from waste facility are:

- A decarbonisation plan for the energy from waste facility is required. This plan should aim for a ~90% reduction in emissions from the facility.
- The main pathway to achieve emission reductions is likely to be reductions in the volume of waste combusted, achieved through reduction in waste volumes, diversion of food waste, and increasing recycling rates to at least 65%. These measures will result in reductions in the amount of heat and electricity that can be produced.
- There is a possibility that carbon capture and storage at the existing facility could be used to limit the volume of waste reduction required, however technical viability would need to be assessed and it is not thought to be economically viable at present.

Implications for housing decarbonisation

Waste heat created by energy from waste facilities is often regarded as a 'low carbon' opportunity to heat homes, due to methodologies for emissions accounting explained in the diagram opposite. In reality, emissions from the St. Dennis facility need to reduce significantly, which will reduce the amount of waste heat available. Combined with its remote location and the low density of nearby housing, this implies a limited practical role for networked waste heat in decarbonising homes.

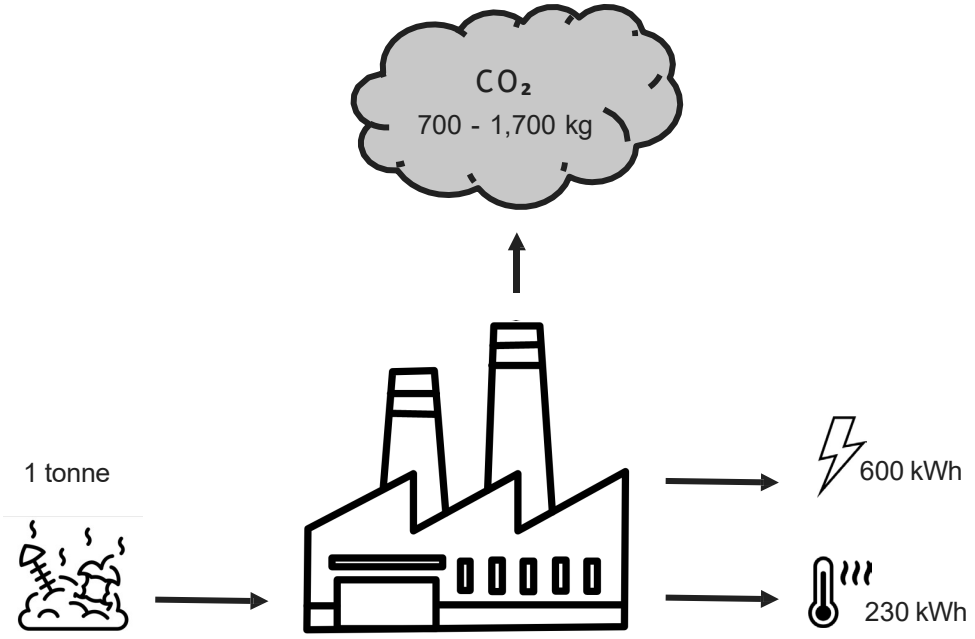


Diagram showing electricity, heat, and carbon dioxide produced through the combustion of one tonne of municipal solid waste in a waste to energy plant. Figures are based on typical industry averages. To avoid double counting, the IPCC and GHG Protocol methodologies for emissions accounting allocate the emissions from waste combustion to the electricity produced, rather than the waste heat. This is often misinterpreted as the heat being 'low carbon'.

Other Heat Sources | Hydrogen

Hydrogen Heating

Dozens of independent studies, including those from the Climate Change Committee, have indicated there is unlikely to be any significant role for hydrogen in heating buildings. Despite this, some gas network operators and boiler manufacturers continue to promote use of hydrogen as a potential alternative to natural gas for heating buildings. The government plans to make a 'decision' on any potential role for hydrogen by 2026.

Hydrogen from fossil fuels

Hydrogen production methods are summarised in the adjacent table. Three use fossil fuel feedstock and so require carbon capture and storage (CCS). The Committee on Climate Change estimate that hydrogen with CCS could theoretically achieve emissions reductions of 60-85% relative to using natural gas. However, there is little, if any, evidence to support the existence of commercially viable CCS that doesn't rely on using captured CO_2 for Enhanced Oil Recovery (EOR).

Green Hydrogen

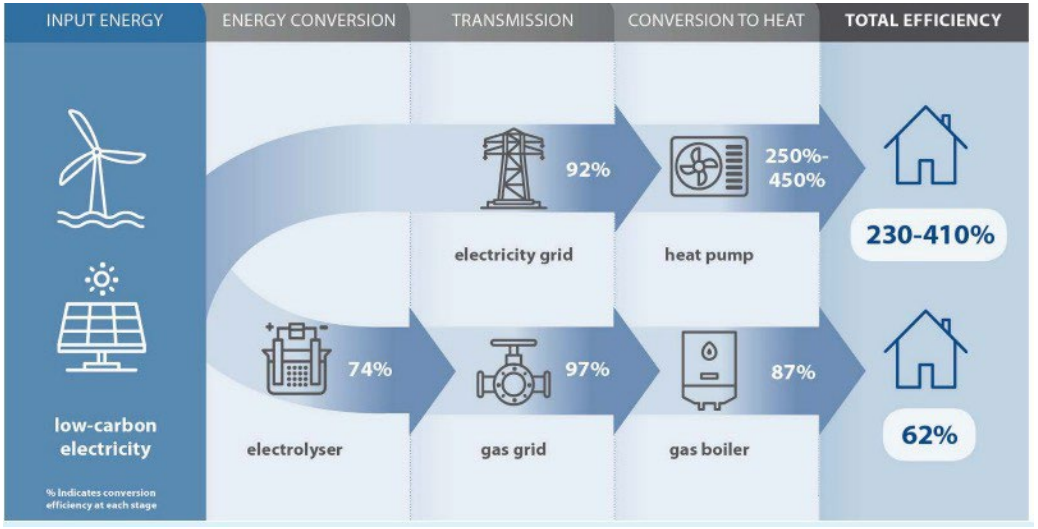
Production of hydrogen via electrolysis powered by low carbon electricity sources offers a more plausible route to create low carbon hydrogen. However, as the diagram to the right indicates, this process is relatively inefficient compared to using the same electricity to power heat pumps. This means the cost and carbon emissions from hydrogen heating would also likely be several times higher than for heat pumps, rendering it uncompetitive.

Conclusion

Several fundamentals do not support a role for hydrogen heating in this housing decarbonisation strategy. These include low system efficiencies, safety concerns (not discussed here), and the cost of maintaining separate electricity and gas networks, versus phasing out gas.

Process	Global Production	Unabated Emission Factor	Cost in 2025
Steam-methane reformation*	49%	285 gCO_2/kWh	£28-50 / MWh
Partial oil oxidation*	29%	-	-
Coal Gasification*	18%	675 gCO_2/kWh	£68 / MWh
Electrolysis	4%	0-325 gCO_2/kWh	£89-92 / MWh

Comparison of hydrogen production methods. Those marked with a star indicate use of a fossil fuel source. Data from UK CCC and IRENA



System efficiency of hydrogen boiler compared to heat pumps. It is more efficient to use electricity directly at the building level rather than having to turn in into hydrogen which would then be burnt on site (image source: Committee on Climate Change)

Appendix 2.2

Technical Solutions:
Electrical supply capacity (for heat pump readiness)

This section explains the importance of electrical supply capacity in decarbonising heat

Electrical Supply Capacity | Domestic Electrical Supplies

Variation in Supply Capacities

The electrical supply capacity varies across homes in the UK depending on:

1. Age of the supply
2. Whether or not the supply is 'looped' (this is where the supply cables are daisy-chained between two homes)
3. Distribution Network Operator's policy on how much capacity to provide
4. Other factors, such as a homeowner requesting a non-standard supply

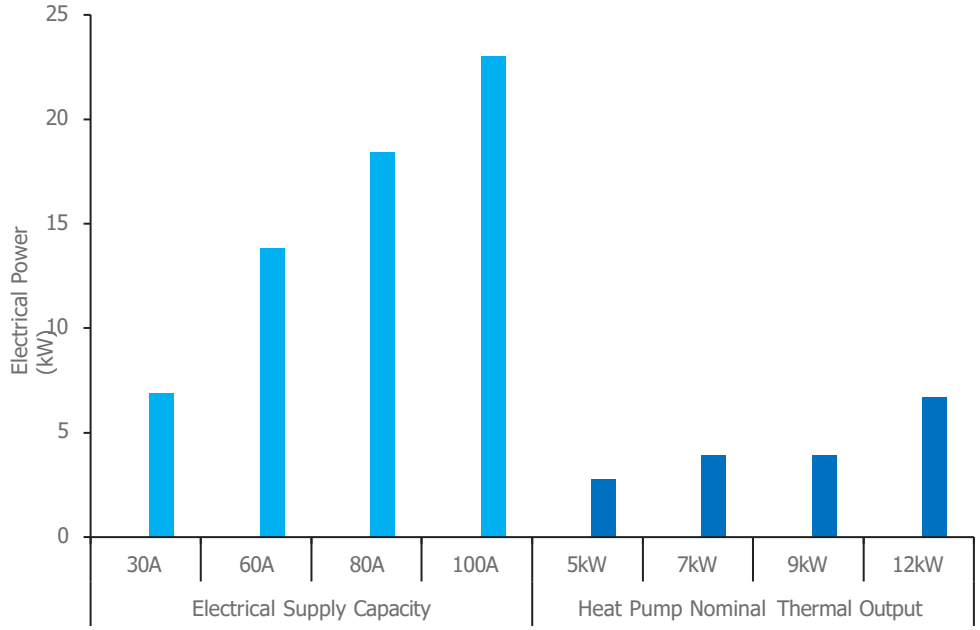
Typical Supply Capacities

Domestic electricity supplies are usually single phase, though a small number of properties with larger demand may have three phase supplies. Single phase supplies are usually one of the following capacities:

- 30 Amp – Older supplies from the 1930's-60's
- 60 Amp – Common supply capacity from the 1940's-present
- 80 Amp – This is currently the standard domestic supply being provided by National Grid Electricity Distribution in Cornwall.
- 100 Amp – These were installed from the 1990's until present day. They are currently available upon request, however the property owner has to pay for upgrade costs above 80 Amps.

Heat Pump Electricity Demand

The adjacent graph compares the amount of electrical power that can be delivered by these supply capacities to the peak electrical power required by different sizes of single phase heat pump. Lower capacity electricity supplies may not be able to provide enough power for larger heat pumps to operate, once allowance for other domestic loads is included.



Typical range of domestic electrical supply capacities compared to peak electrical demands for residential heat pumps capable of running on a single phase electricity supply. To determine whether an electrical supply is sufficient, allowance for other electrical loads must be added to any new demand created by a heat pump by carrying out a maximum demand calculation. In many cases, smaller properties and those with lower heat demands will be able to fit a heat pump using their existing supply but may have to upgrade in the future if they fit an EV charger.

Electrical Supply Capacity | Heat pump connection process

Connection Process

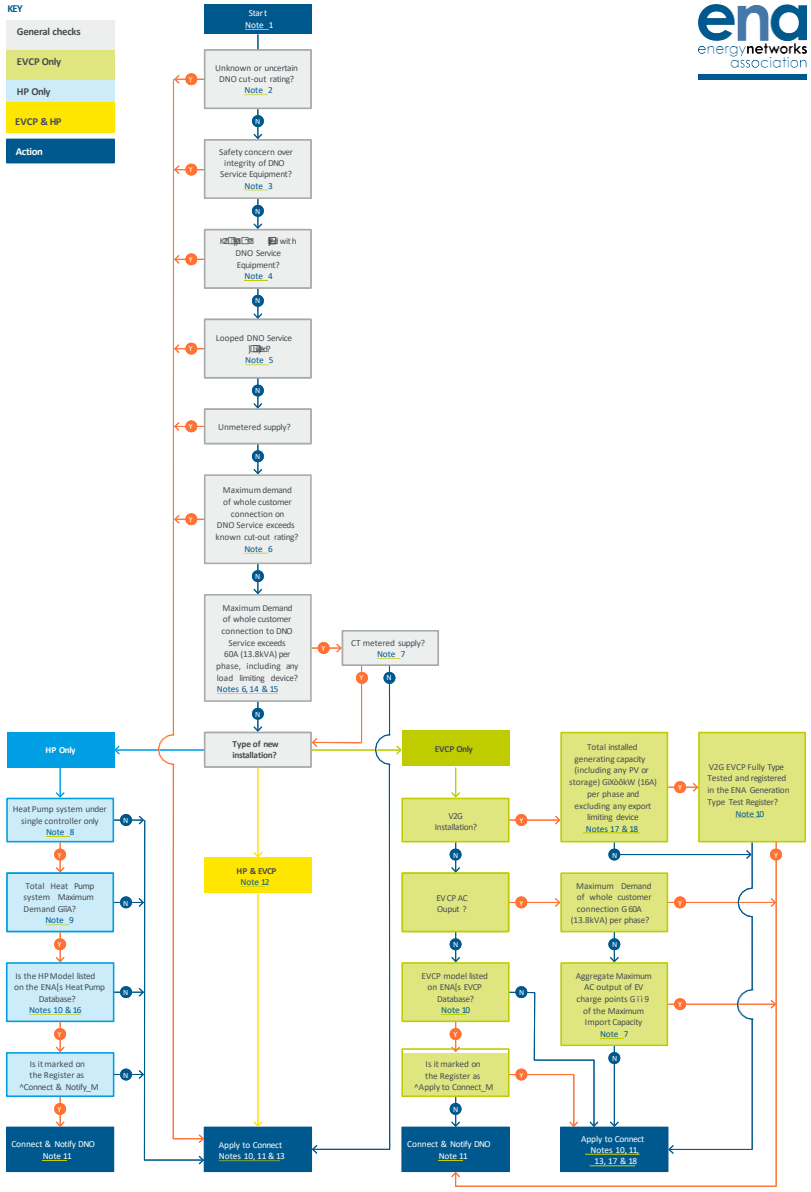
The adjacent flowchart published by the Energy Networks Association outlines the connection process for heat pumps (and electric vehicle chargers). Key items that must be checked for the heat pump to be immediately connected, rather than having to apply to the Distribution Network Operator (DNO) to connect, include:

1. Cut-out rating – this is the amperage of the main DNO cutout or isolater switch.
2. Safety of the DNO equipment must be checked.
3. Looped supplies should be identified as they will likely need to be removed by the DNO. This often involves extensive groundworks.
4. Maximum electrical demand should be calculated to check the supply is adequate once the heat pump has been fitted.
5. Heat electrical demand should be less than 32A. This covers most heat pumps below 12-14kW of nominal thermal capacity.
6. ENA database should have the heat pump listed and marked as ‘connect and notify’. This cannot be checked until the homeowner knows what heat pump will be installed.

Ensuring homes are heat pump ready

Most homeowners will be unaware if their property’s electrical supply meets these required criteria and is therefore heat pump ready. This introduces a risk that if an existing fossil fuel heating system fails, a homeowner may be unable to fit a heat pump in an acceptable timeframe if DNO work is required.

A key enabling action for heat decarbonisation is therefore for property owners to proactively check the status of their electrical connection and plan for required upgrades before their existing heating system fails. The DNO usually covers the cost of works required to their equipment up to the standard service capacity of 80A, so in many cases there is no cost to the homeowner.



Flowchart showing the grid connection process for heat pumps and electric vehicle chargers. It is vital that homes ensure their electrical connection is heat pump ready before their existing heating system fails to avoid emergency replacements of fossil fuel heating. (image source: Energy Networks Association)

Appendix 2.3

Technical Solutions:

Building fabric and ventilation

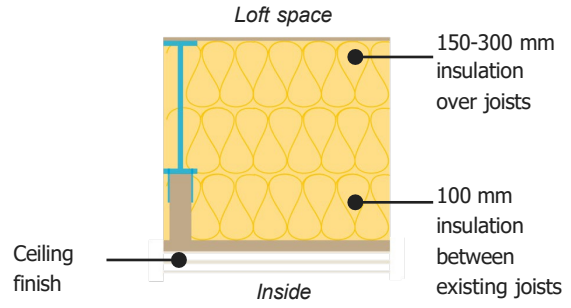
This section explores the technical solutions to improving building fabric efficiency and ventilation

Building Fabric and Ventilation | Floors and Roofs

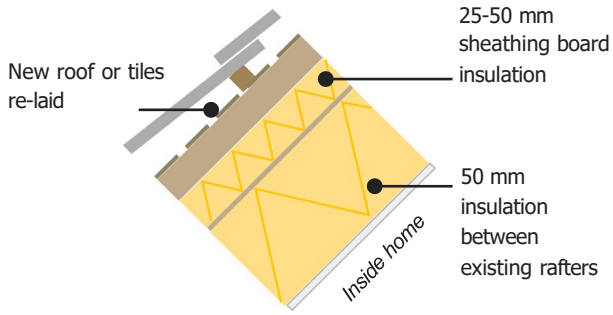
Loft / roof insulation approach

For unheated attic spaces the simplest approach is to insulate the joists in the loft. It is important to consider the eave-loft junction carefully in order to prevent air leakage and properly ventilate the unheated loft space to avoid the condensation risk.

Loft space can also become a 'warm space' room by insulating the roof. Insulation can be added in between the rafters and an insulated sheathing board over the rafters as shown in the rafter detail to the right. Pay attention to flashing, sealing and roof penetrations such as chimneys, skylights and roof vents, in order to prevent air and water leaks.



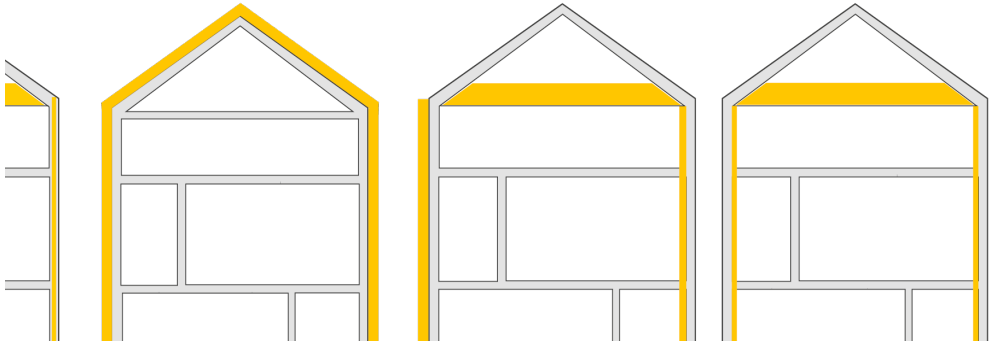
Roof insulation at joist level



Roof insulation at rafter level

Continuous external insulation approach

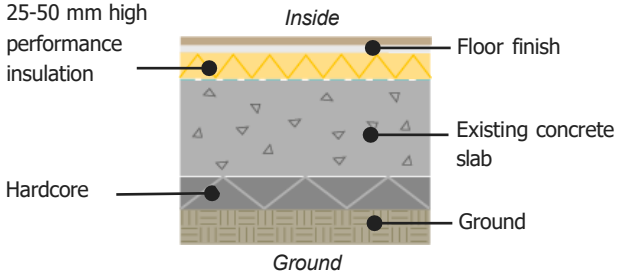
When wall insulation extends up the roof, you should consider extending eaves to cover the additional wall thickness, ensuring a continuous thermal barrier. It is important to maintain or provide ventilation at the eaves and apply flashing and sealing to prevent water ingress. External roof finishes such as tiles and rainwater goods like gutters will need to temporarily move during the installation of external roof insulation.



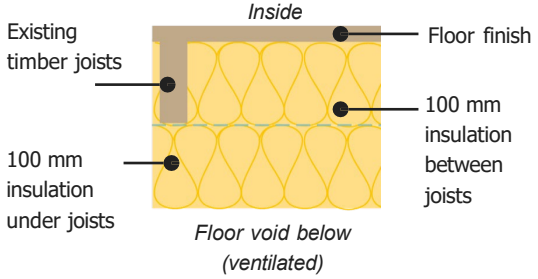
Ensuring continuous insulation

Ground floor insulation

Insulating concrete floors may require raising the floor-level, therefore special consideration should be given on the impact on steps at the entrance, door heights and consistent staircases levels. In the case of raised timber floors, weatherproof insulation can be added between the floor and the ground, protecting the structure from moisture rising from the ground, as well as insulation in between timber joists to enhance the thermal performance of the floor.



Solid floor



Timber floor

Building Fabric and Ventilation | Walls

Insulating externally or internally?

When possible, it is generally best to insulate walls externally than internally. Allowing the insulation to wrap around the building continuously, keeping it warm and dry, while avoiding the need to address weak points and junctions e.g. around floor joists, is preferable. However, the choice will come down to what is practical and acceptable from a planning perspective. This section highlights the key approaches to wall insulation and how they differ in terms of space, aesthetics preferences and disruption to occupants.

Cavity wall insulation

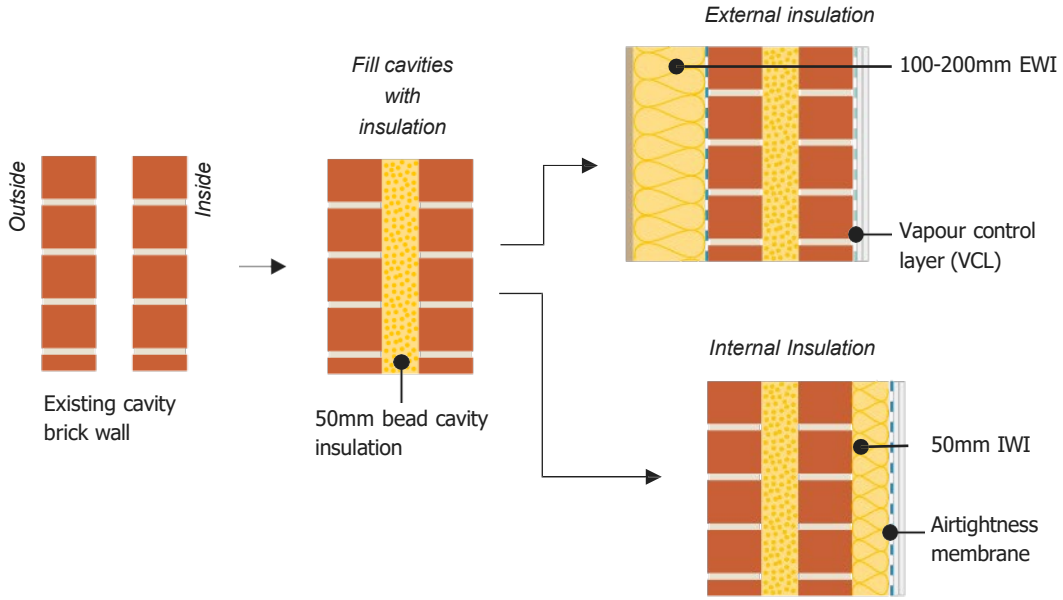
It has no visual impact and improves energy efficiency, but not as much as external or internal insulation. It is however generally the first step to adopt. Cavities should be cleaned to the base and filled with a non-hygroscopic, non-capillary active bead insulation to minimise the risk of moisture problems. Existing brickwork should be repointed to keep the wall dry and the rain out of the cavity.

External wall insulation (EWI)

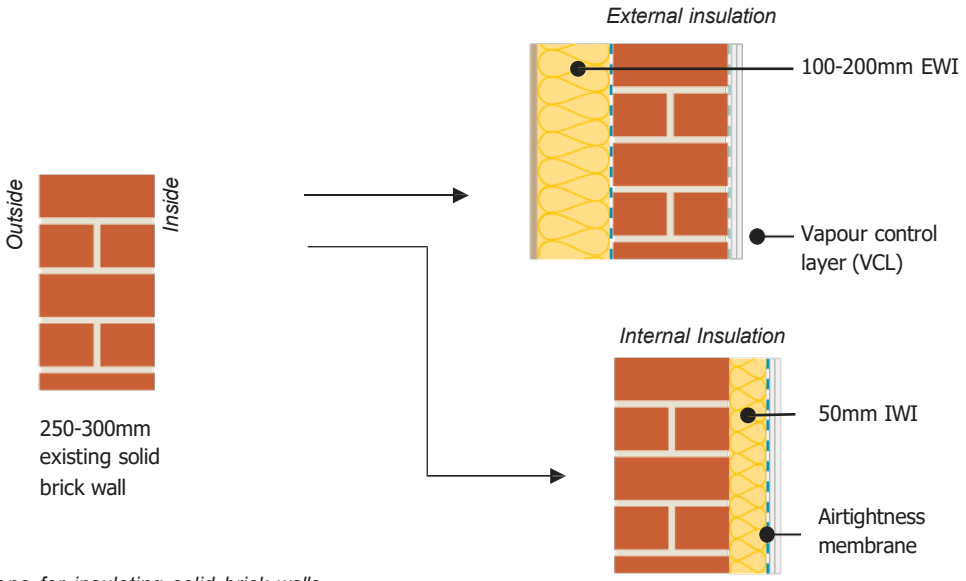
It is effective thermally, maintains the internally exposed thermal mass, does not reduce internal space and creates less disruption during fitting. However, it will require planning permission as it will affect the external visual appearance will be affected. Finally, roof eaves may require extending or parapets wrapping. Insulation is generally finished in render, brick slips or pebbledash cladding.

Internal wall insulation (IWI)

Breathable materials should be used when insulating internally e.g. wood fibre insulation or plastered insulation. Non-breathable materials e.g. rigid foam insulation, can achieve a good thermal performance and are often cheaper, but they can also trap moisture and are more challenging to install well, for example around junctions. Where internal space is limited consider using thin products such as aerogel insulation. All insulation materials should be installed in accordance with Building Regulations 2010 approved Document B:FIRE SAFETY.



Options for insulating cavity walls. For step 1 ensure measures have been made to prevent condensation.



Options for insulating solid brick walls.

Building Fabric and Ventilation | Insulation examples

Insulated ventilated timber floor using hydroscopic insulation and breathable membrane (Ecological Solutions)

External wall insulation (passivehouseplus.co.uk)

Earthwool loft insulation (www.the-salutation.co.uk)

Wood fibre insulation (Prewett bizley Architects)

Wood fibre insulation panels fixed and taped with airtightness tape before plasterboard and batten lining (Prewett bizley Architects)

House façade after external wall installation (Prewett bizley Architects)

Cork granules visible in lime/cork plaster internal plaster insulation (Prewett bizley Architects)

Initial coats of lime/cork plaster being sprayed onto a masonry wall (Prewett bizley Architects)

Building Fabric and Ventilation | Windows (and doors and rooflights)

Why are windows so important?

The sheer level of improvement that current glazing technology can now achieve, and the fact that all upgrades can take place with residents staying at home, make this fabric measure the most attractive and often impactful from an energy saving perspective.

Improving the windows will also deliver significant additional benefits to the residents such as better thermal comfort (the window pane will be warmer), less cold draughts and better acoustic insulation, making it a more attractive and likely proposition than other retrofit measures.

The replacement of all single glazing to good double or, preferably to triple glazing (or a u-value less than 1.0 W/m²K), is a relatively easy first step for most home retrofit plans. Importantly, this measure can also deliver potentially significant CO_2 savings and will sometimes be an appropriate first step to enable many homes to be 'heat pump ready', through energy savings and peak heat demand reduction.

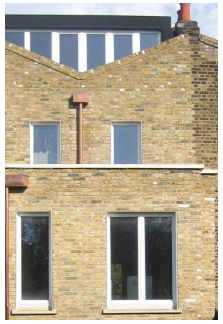
Aim for the best possible window

Altering windows is expensive and likely to only occur once every few decades, especially if embodied carbon is being considered, so it is crucial that changes are made with a view to optimising performance as much as possible. The images on the right show examples of appropriate windows in different scenarios.

In heritage properties to maintain original windows long-life timber paints (up to 15 years) are available. Original windows in good condition can be draughtproofed and secondary glazing can be added. Original shutters in historic buildings can help with heat loss and overheating in summer.

- **Windows**: replace with triple glazed windows or best available where there is a constraint around appearance.
- **Doors**: replace with product with low U-value and good airtightness class.
- **Ventilation**: Recommend new windows with no trickle vents + move to mechanical ventilation, e.g. MVHR.
- **Airtightness:** seal and tape connections at reveals and floor.

Energy efficiency



Triple glazed casement

U-value ~ 0.8 W/m²K

Very high thermal performance. Airtight and the frame is robust.

Not always possible in conservation areas.

(Prewett Bizley Architects)

Advanced secondary glazing

U-value ~ 1.0 W/m²K

Original window is preserved. Less disruptive installation process.

Repairs are needed to make the existing window good first, which adds costs.

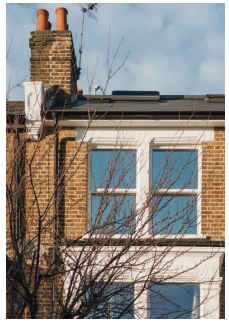
(Prewett Bizley Architects)

High-quality double glazed casement

U-value ~ 1.2 W/m²K

Fairly high thermal performance.

(nathanmccarter.co.uk)



Triple glazed mock sash

U-value ~ 0.9 W/m²K

Very high thermal performance.

Window is airtight and the frame is robust.

Fake astragals become apparent when observed close-up.

(Prewett Bizley Architects)

New evacuated glazing

U-value ~ 1.1 W/m²K

High thermal performance. Similar visual appearance to original window.

Frames are not thermally broken. Tend to be relatively expensive. Lead times can be lengthy.

(Prewett Bizley Architects)

Double glazed sash

U-value ~ 1.6 W/m²K

Average thermal performance.

Fake astragals become apparent when observed close-up.

(Prewett Bizley Architects)

Window types from most to least efficient: triple glazing, best quality evacuated glazing, advanced secondary glazing, new evacuated glazing, high quality double glazing, double glazed sash.

Building Fabric and Ventilation | Window upgrade examples


Secondary glazing in front of historic stained glass
(Levitt Bernstein Architects)

Triple glazed mock sash window
(Prewett Bizley Architects)

Triple glazed casement
(markstephensarchitects.com)

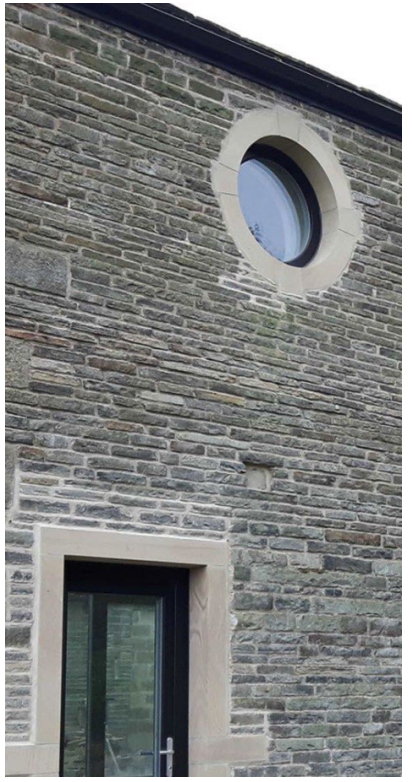
Triple glazed casement
(weare21degrees.co.uk)


Evacuated glass sash windows within a conservation area
(Prewett Bizley Architects)

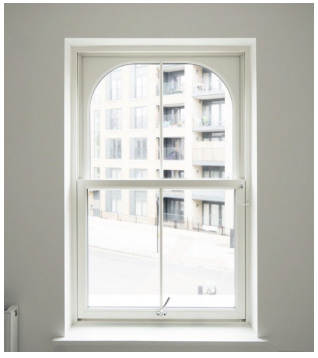
Advanced secondary
(Prewett Bizley Architects)

Triple glazed casement
(passivehouseplus.co.uk)

Double glazed casement
(nathanmccarter.co.uk)



triple glazed casement window / door
(weare21degrees.co.uk)




Double glazed sash window within a conservation area
(Prewett Bizley Architects)

Sliding sash and casement secondary glazing (listed)
(Prewett Bizley Architects)

triple glazed casement window
(rmbuildersandcontractors.co.uk)

Building Fabric and Ventilation | Airtightness

A road map to airtightness

Improving airtightness significantly reduces heat loss through the building fabric and makes homes more comfortable – an airtightness strategy should therefore form part of the whole house retrofit plan. This should include a clear road map detailing the airtightness measures to install at each stage, how key junctions and interfaces will be made more airtight, and when and how the airtightness target will be verified.

Airtightness baseline target

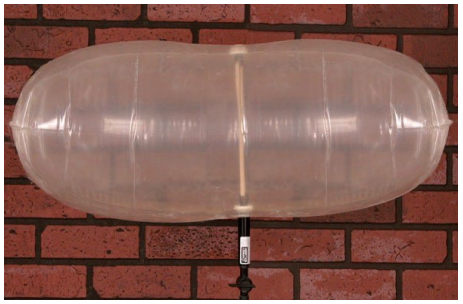
Most pre-retrofit homes have an airtightness of 7-15m³/m²hr (when the house is pressurised at 50Pa). At these levels, the heat loss due to infiltration will very high. It is typically possible to achieve between 3-5 m³/m²hr by ensuring visible gaps are filled and using well fitted windows and doors.

Taking airtightness further

An airtightness of 1m³/m²hr at 50 Pa is possible for retrofit, but depends on specialist air tightness tapes and windows that have especially good seals. Achieving this best practice level of performance is generally only possible with a 'deep retrofit, as it is likely to be necessary to strip back to the basic structure and perform basic repair work before methodically applying airtightness products and principles. Applying airtightness tape to joist ends is a common measure required to achieve good airtightness, and large gaps may need filling with mortar (with a suitable primer).

Improve ventilation together with airtightness

Airtightness works, or airtightness levels of 5 m³/m²hr or below should trigger some form of continuous extract ventilation to ensure good air quality. Some options are described on the next page.



Replacing windows represents a significant opportunity to improve airtightness. (top, caulking windows - bobvila.com)

Removing chimneys removes an air leakage path. An alternative is to block with a chimney balloon (left, thegreenage.co.uk) and chimney cap (top left, ncc-flue.co.uk)

Stripping back to the structure (Source: Eightpans) and applying airtightness tape to joist ends (Source: Ecomerchant) will deliver best practice levels of airtightness.

Retrofit components | Ventilation

Minimum requirements

The Building Regulations sets a minimum requirement for extract ventilation in bathrooms, toilets and cooking areas. The most common and simple approach to meeting this uses dedicated local extract fans in each space. These rely on pulling air through leaky windows and can be visually intrusive and noisy. Usually their controls are very simple, which means they can either run too often or too little, resulting in either too much cold air being pulled into the home or moist air building up.

A retrofit strategy must address the issue of ventilation

Because local extract fans can pull cold air through windows, people will often turn off fans or seal up the gaps, restricting the air movement and causing problems with moisture. Retrofit measures themselves often try to stop these draughts as they contribute to heat loss, but as this air movement is a necessity it is important that reliable, intentional ventilation is added when a building is retrofitted. Several options are possible but some work much better than others.

Positive input ventilation (PIV)

Positive input ventilation brings fresh air in, normally through the roof, pushing air through the building and out through the fabric. It is an effective way of improving air quality, and reducing risks of moisture and radon build up.

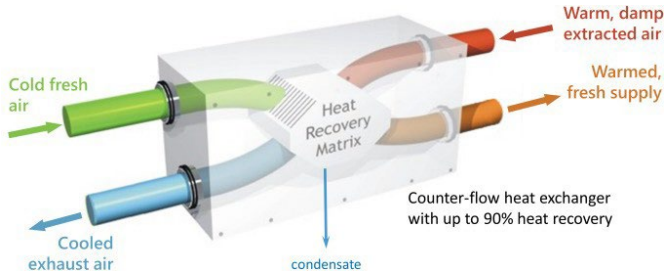
Mechanical ventilation with heat recovery (MVHR)

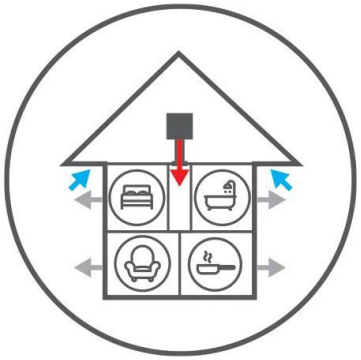
MVHR provides both supply and extract ventilation. An MVHR system recovers heat from the air leaving the building and transfers it to the fresh air entering the building. Because the incoming air is warmed by the extract air, they can help achieve very low heating demands. It is the most reliable, low energy way to provide good air quality. It is more expensive, and requires more equipment, installation effort and regular filter replacement. MVHR systems can be set up with the supply rate higher than the extract rate, to achieve similar benefits to PIV.

A small MVHR system in a bulkhead in a flat

MVHR system diagram. Heat is exchanged between the warm exhaust and cold supply via a grille, without the two air streams mixing

(totalhome.co.uk)





Positive input ventilation system in a loft (dorsetelectricalsolutions.com) and diagram showing typical set up and air flow (precision-dampproofing.co.uk)

Building Fabric and Ventilation | Thermal Bridging

Thermal bridging happens when there is discontinuity of insulation, for example where a structural material, with higher thermal conductivity passes through an insulation product, with lower thermal conductivity. When retrofitting a home it is sometimes difficult to avoid discontinuity of insulation at a junction. The diagrams to the right give examples of different insulation junctions, and show how to avoid discontinuity of insulation.

Connection: In the easiest scenarios the insulation continues on the same side of the structure (e.g. always on the cold side, or always on the warm side). The corner connection should be made as robust as possible.

Overlap: When insulation changes from inside of the structure to outside of the structure it can be very difficult to achieve continuity of insulation. Overlapping the insulation by 1m helps to reduce the impact of the thermal bridge.

Break: when a structural junction passes through an insulation layer, it can be possible to partially continue the insulation line by adding a low conductivity material with high compressive strength between the structural elements.

Insulation Interactions

	EWI	IWI	Rafter	Flat roof	Loft	Terrace	Ground floor
EWI	Connection	Overlap	Connection Protection	Connection	Connection Ventilation	Connection /Break	Overlap / Break
IWI *	Overlap	Connection	Connection	Overlap	Connection Ventilation	Overlap (double)	Connection
Window	Continuity	Continuity	Continuity Drain-off	Continuity	Continuity (loft hatch)	Continuity Access	Continuity Access Height

Indicative example fabric / insulation interactions. See retrofit archetype pages for more specific examples. Moisture protection should always be considered for internally insulated structures

External EWI corner junction

Window to EWI junction

EWI to rafter junction

Ground insulation upstand

Examples taken from retrofit of a 1960s house (passivehouseplus.co.uk)

Appendix 2.4

Technical Solutions:

Solar photovoltaics

This section explores the role of solar photovoltaics in housing decarbonisation

Solar Photovoltaics | Overview

Buildings are an asset for net zero

For Cornwall's housing stock to be net zero carbon in operation, there must be sufficient low carbon electricity generation to meet the energy needs of these homes over the course of a year. While much of this will come from large scale renewables, there are several advantages to supplementing this with building mounted renewable energy sources. In practice, solar photovoltaic panels (PVs) are the main technical solution to provide this on most buildings.

How much solar can a home generate?

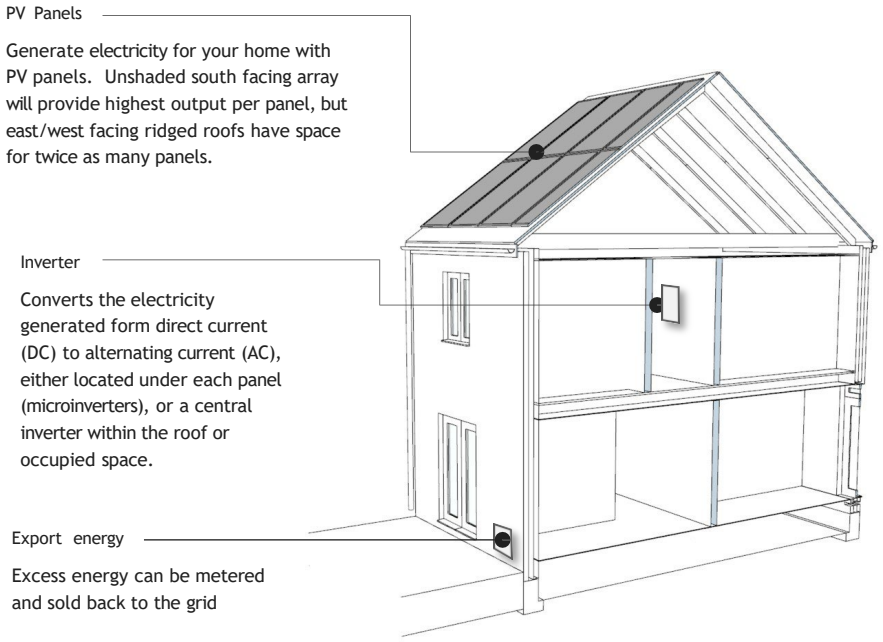
Some homes may be able to generate more electricity than they require, while others may only be able to generate a small proportion, or none at all, especially in blocks of flats.

A single residential solar panel in Cornwall can generate about 350-500 kWh a year, depending on its efficiency, orientation, and shading. This means 11-15 panels are typically sufficient to generate all the energy required by an average home that is heated by a heat pump, with levels of space heat demand and electricity use that are in line with OFGEM's typical domestic consumption values (11,500 kWh of heat and 2,700 kWh of electricity).

Many homes in Cornwall will require less energy than this due to the mild climate, however the aim should generally be to maximise the PV capacity on the best locations.

Key components

The adjacent diagram shows the simplicity of a solar installation, which consists of the panels, which are usually mounted on a roof, and an inverter (or set of microinverters). In addition, there are several safety disconnect devices and at least one electricity meter. Panels may be mounted on any surface that receives enough sunlight, including outbuildings, pergolas, or walls.



Over a million homes in the UK already have solar panels, many of which have been retrofitted. Notify your building's insurance provider if you are having solar panels fitted to ensure they are covered and your policy remains valid (image source: The Guardian)

Solar Photovoltaics | A source of clean cheap electricity

Solar electricity costs can be very low

While solar electricity is effectively 'free' once installed, the effective cost of the electricity can be calculated using an industry standard approach called the 'levelised cost of energy'. This factors in the cost of building and maintaining the system, the cost of financing the system, and the gradual reduction in energy output over the system's lifetime.

The adjacent graph shows that building mounted solar can be significantly cheaper than grid electricity, even compared to some of the most competitive dynamic tariffs, which effectively provide access to cheap grid-connected renewable energy.

How does solar save money?

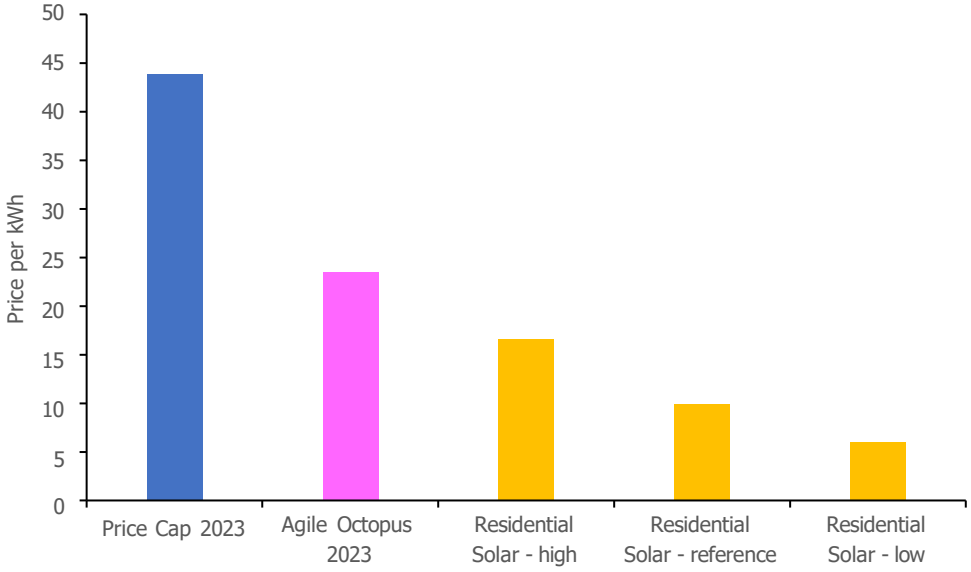
Solar panels reduce electricity costs in two ways. The first is by allowing the occupant to directly use the solar that is generated, which is known as 'self consumption'. The second is by selling electricity back to the grid via the Smart Export Guarantee. Solar Energy UK maintain a league table of export tariff rates, which range from a few pence per kWh to 20p/kWh.

Electric heating systems offer a unique advantage over most other heat sources in that they are able to be powered from cheap solar energy. This can result in very cheap, or free, hot water for much of the year, and significant reductions to energy bills even in winter.

Metering in flats

Electricity metering for solar in flats is less straightforward than for houses, due to complexities in connection and metering. The main solutions are:

1. Connect the solar array to the landlord's supply, in which case the landlords receives mainly export tariff payments.
2. Split the solar array into several smaller arrays and connect one to each flat.
3. Submeter the solar array, effectively creating a 'private wire' network in the building.
4. Use a 'Solshare' type system, which automatically distributes solar energy from a single array to multiple flats.



Levelised energy costs from building mounted solar compared to average 2023 rates for the energy price and Agile Octopus tariffs. High scenario assumes £1,800/kW installed cost, 6% interest rate and 25 year lifetime with 0.8% annual degradation. Reference scenario assumes £1,500/kW installed cost, 5% interest rate and 30 year lifetime with 0.4% annual degradation. Low scenario assumes £1,300/kW installed cost, 3% interest rate and 30 year lifetime with 0.4% annual degradation.

Solar Photovoltaics | Installation examples

Solar installation on Cornwall Housing homes (carboncopy.eco)

Solar roof tiles at Kynance Cove Cottage (Kynance Cove Cafe)

Type 1 Cornish Unit with solar panels (Cornish Unit House Owners Facebook Group)

Solar installation on a net zero retrofit in Newquay

Type 1 Cornish Unit with solar panels (Cornish Unit House Owners Facebook Group)

In-roof solar installation (Google)

Solar installation on an outbuilding (solar-gain.co.uk)

In-roof installation of solar panels in Newquay

In-roof solar installation on the North Coast

In-roof solar panels (Google)

Solar installation in Porthleven (Google)

Solar installation on existing roof (Google)

Note: In conservation areas solar panels on the front roof slopes of properties should be considered with care to minimise effect on character, and may require planning permission. Solar slates may be more acceptable than solar panels in such locations.

Appendix 2.5

Retrofit Planning

This section explores the role of retrofit planning for projects from individual homes to large housing estates and portfolios.

Retrofit or redevelop?

This decarbonisation strategy presumes that the majority of existing homes will be retained and, to some extent, retrofitted. It may not be the case for every home. In some cases, the cost in both financial and carbon emissions of retrofitting houses may be greater than demolition and rebuilding new homes on the site. Finding the balance in objective terms depends on quantifiable analyses. There are subjective issues that are more difficult to measure – people and communities are intrinsically connected to houses, and sometimes retrofit is the right option even when the sums don't add up.

LETI Unpicker

LETI have published a guidance note on how to evaluate the carbon balance between retrofit and rebuild options, based on Whole Life Carbon assessment following the RICS guidance.

Viability

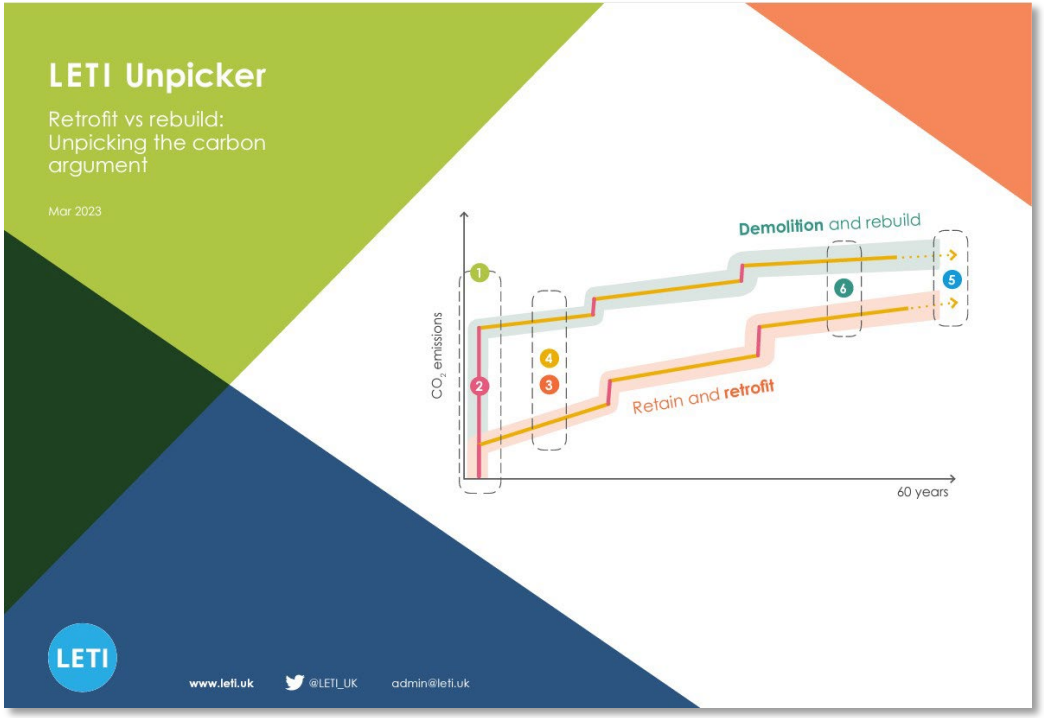
A viability assessment of the relative costs of the two options is likely to highlight the best approach. New build homes must be compliant with Cornwall Council's policy for energy performance and must be net zero in operation.

Longevity

Construction work consumes energy which 'embeds' carbon emissions in the finished structures. Retaining those structures will, in many cases, be the lower carbon route. But retrofit also uses energy and materials and investing those in structures that may only have a short useful life is not necessarily the best overall carbon strategy. Elements that can be reused without being remade, such as heat pumps, radiators and even ventilation units can be used as an interim decarbonisation approach, and then reused.

Circular economy

If demolition is found to be the best approach, circular economy principles should be applied.



Publication from LETI on decision making around retrofitting vs rebuilding

Managing risk

The importance of whole house thinking

Retrofits should take a whole house approach. This means understanding the end goal and working backwards to ensure that interim measures do not prohibit the final intended outcome. These principles are set out in PAS 2035. Adopting PAS 2035 on projects adds some costs but also value and quality. It is generally a requirement of central government funded projects.

PAS 2035 highlights some of the risks of retrofit and puts in place strategies to mitigate these:

Surveys

Specific survey information is recommended depending on the house type and context as well as the scope of retrofit planned. This is a vital step in any retrofit and is work that can be done by landlords for their stock in order to prioritise buildings with greatest need.

Moisture

Risk triggers - Insulating on the inside of the structure and reducing ventilation.

Solutions – repairing leaks, limiting production of vapour in the home, appropriate ventilation, appropriate hygroscopic insulation materials, limiting U-values when insulation is located on the warm side of a structure (e.g. with internal wall insulation).

Overheating

Risk triggers – reducing heat loss through insulation, improved windows, reduced infiltration

Solutions – shading, ventilation, low g-values, appropriate size of glazing areas where possible.

Taking into account historic characteristics

A whole house retrofit needs to respond sensitively to historic characteristics. Not all measures may be appropriate in every building.

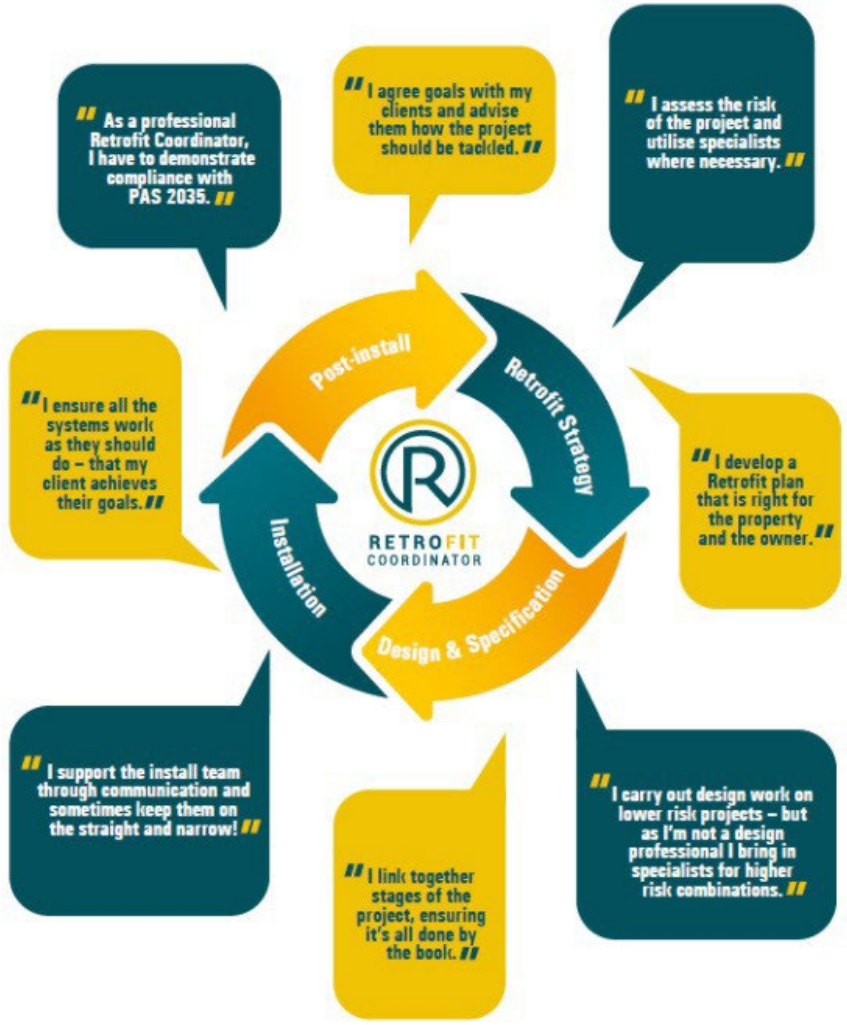


Diagram from Retrofit Academy training showing how the retrofit process should work and how retrofit coordinators should help facilitate this.

Delivery watch points, compromises and red lines (avoiding lock-in)

Do not sacrifice long term objectives

Although we recommend opportunistic thinking to allow alignment with maintenance programmes and other priorities, it is critical that 'whole house' retrofit concept is not lost and that the plan can ultimately meet the net zero carbon objective while minimising risks.

Avoid retrofit lock-in

In order to avoid locking in poor performance, we recommend that each measure reaches the optimal energy performance at the first opportunity, as it is less likely that works will be revisited for many years once an 'adequate quality' is reached.

Prepare for next step

The measure implemented at any time should not cause difficultly for future measures that are necessary as part of the net zero carbon plan. Examples are given for interdependencies and future considerations in the table to the top right. In general, it is important to ensure that there is adequate space and that connections with future measures and sealing of airtightness layers are prepared.

Integrating fabric measures

Examples are shown for interactions between building fabric measures in the table to the bottom right. Some key concepts include ensuring continuity between insulation layers, or allowing for sufficient overlap where continuity is not possible. Windows should be installed centrally on the insulation line with insulation overlapping with the window frame. A single airtightness line should be maintained on the warm side of the insulation for all junctions. Space and protection should be allowed for the insulation thickness on an adjoining element at a later stage, for example roof eaves should be extended to plan for future external wall insulation, and parapet flashing should allow for future connection between roof and wall insulation. Future connection of the airtightness line will also need to be planned for.

First measure / Subsequent measures	Insulation	Windows	Ventilation	Heating system	Solar PV
Insulation / airtightness	Connections, overlaps, ventilation, moisture risk (see table below and Archetypes).	Ensure windows Continuity	Sealing around fabric penetrations, install sleeves to maintain airtightness and thermal line		Share scaffolding. Prepare cables in insulation layer, install sleeves
Windows	Align with future insulation		**Ensure ventilation is upgraded before or at same time as windows**		
Ventilation	Consider space for insulation when planning duct runs and penetrations				Consider position of PV on roof if ducting through roof
Heating system*	Consider timing of heat pump relative to fabric works. Consider space for insulation when mounting radiators.		Consider timing of heat pump installation in relation to MVHR works		Consider location of PV if installing ASHP on roof
Renewable energy	Ensure roof is insulated first / concurrently			Consider position of ASHP on roof	

*Interdependencies and futures considerations between fabric, ventilation, heating and renewable energy systems. Also refer to PAS 2035. *No new gas heating systems should be installed, and existing boilers should be removed as soon as possible.*

Intervention Points

A intervention point is a strategic period or event that occurs within a building's lifecycle, when it is easier or cheaper to carry out decarbonisation work. Efforts to decarbonise housing can therefore be more effective if they take advantage of these intervention points.

Need for a planned whole building approach

Improvements to energy efficiency might happen in lots of different ways. However in order to successfully deliver a retrofit, a coordinated approach is needed for the whole building or group of buildings. The council should set an example and ensure that a whole house approach is taken on all projects under their control.

The whole house plan will be unique to the building but could be based on the archetypes described in the decarbonisation strategy. Funding or delivering one element for multiple homes would need eligibility criteria to check the measure fits into the individual plan for each home.

Opportunities for Cornwall Council to help

A summary of the process and some specific opportunities for the council to have an impact is summarised to the right. Recommended actions and activities are explored and summarised in more detail in this section.

Examples of intervention points

Direct intervention

Empty homes	House extension requiring planning permission	House extension requiring listed building consent

Provide guidance

Boiler failure	New homeowner carrying out upgrades	House extension not requiring planning permission

Example retrofit process	*Opportunities for Cornwall Council to help*
Building assessment - Context research and building survey. Identify repairs required and reference maintenance schedules. Identify planning and heritage constraints, practical constraints.	Identify common planning constraints and provide web guidance on what is possible/acceptable.
Identify suitable interventions - propose appropriate interventions based on opportunity and technical feasibility	Recommend defined packages of measures based on archetype. Training for surveyors or builders on these packages of measures Identify routes to retrofit and compile resources for residents.
Plan - package interventions in line with need, impact of maintenance opportunities, and technical requirements. Get consents if needed. Cost and get funding. Identify suitable delivery mechanism with a single stage or phased approach	Aggregate works across multiple homes to give better purchasing power. Standardise application process for common planning constraints.
Procurement - Find trusted and capable tradespeople to deliver the work.	Provide training for tradespeople and Trustmark accreditation. Publicise local trusted tradespeople.
Installation - Carry out works. Manage installation and minimise disruption to residents. Construction quality assurance.	Provide quality assurance checks, e.g. as part of building control and using PAS 2030/2035
Feedback - Monitor quality and performance. Use experience from individual projects to refine offer and suggest new interventions.	Lightweight survey for residents and homeowners on making the process better. Identify new interventions?

Intervention Points for Council owned Homes

Review planned maintenance and upgrade programmes

Cornwall Council has ongoing regular and planned maintenance programmes for their own stock of 10,481 homes, 11% of which already have some form of heat pump. They generally cover regular maintenance; housing upgrade and more major improvement works. Current or upcoming projects may be missing opportunities to contribute to reducing carbon emissions and improve energy efficiency, or even making the situation worse. The council's housing team should therefore review their current maintenance and upgrade programmes as soon as possible to identify projects where opportunities are being missed. These reviews should recommend which changes in scope of works could contribute to the retrofit programme.

Seek synergies with other housing programmes and priorities

The review should include other housing programmes to cross check changes that could trigger retrofit work to reduce total cost. For example work under the Housing Health and Safety Rating System (HHSRS), Building Safety Programme (BSP) and the Decent Homes programme should seek to find common ground and synergies.

Help others update their maintenance programmes

Maintenance programmes between councils and also other landlords (including Registered Social Landlords (RSLs)) are likely to be similar. When Cornwall undertake a review of their maintenance programme against the recommendations of this decarbonisation strategy, they should share the framework with local RSLs. The framework should:

- list all types of maintenance works that should be included in the review;
- identify an appropriate point in a project where it is not too late to change. For example, this could be pre-construction start, or pre-installation of the part of the works in question.

Maintenance item	*Lifetime*	*Retrofit measures to action or consider*
Electrical Wiring	Tested every 10 years (homeowner) or 5 years (landlord)	• Spare capacity for heat pump • Metering including submeter for electric vehicle charging and heating • Spare capacity for electric car charging
Boiler	10 - 15 years	• Replace with heat pump system • Improvements required to reduce heat load.
Roof repair (tiles, flat roof)	~30 years	• Roof insulation and airtightness • Airtightness connections to surrounding elements
External render or paint	<10 years (cement) 25 years (BBA certified)	• External wall insulation • Replace windows while there is access • Internal wall insulation while there is access and disruption
Windows & door replacement	10 years guaranteed, typically 20-30 years for new windows.	• Replacement with triple glazed windows or best available for appearance constraint. • Ventilation approach. Recommend new windows don't have trickle vents, move to MVHR. • Airtightness connection to wall and floor.
Replastering wall or ceiling	~20 years	• Internal wall insulation (if appearance constrained) • Roof and wall airtightness
Kitchen replacement	~5-10years	• Ventilation strategy. Replace cooker hood with recirculation type or careful direct extract if strategy is for MVHR, or continuous extract as part of MEV system. • Insulation to kitchen floor (if ground floor) • Internal wall insulation behind units
Extract Fan/Cooker Hood	~5-10 years	• Ventilation strategy. Replace cooker hood with recirculation type if strategy is for MVHR, or continuous extract as part of MEV system. • Induction hob and all electric cooking.

Example opportunities for reducing carbon emissions in current maintenance programmes

Our acquisition programme will continue to highlight the importance of the energy efficiency of properties when evaluating its value for money; and where possible the Council will prioritise acquisitions that support our carbon neutrality ambitions.

Retrofit planning for affordable heat decarbonisation

The importance of heating load and flow temperature

When planning housing retrofits that are prioritised to deliver affordable decarbonisation of heat, two of the key technical considerations are the peak heating load and the flow temperature for the heat emitters.

Peak heating load

The peak heating load is the maximum instantaneous power output of the heating system that is expected to be required to maintain a comfortable internal temperature (18 - 21°C, depending on room type) at the minimum outdoor temperature that is expected to occur (-1.2°C for Plymouth)*. Heating load increases with dwelling size, air leakage of a building, and as insulation reduces.

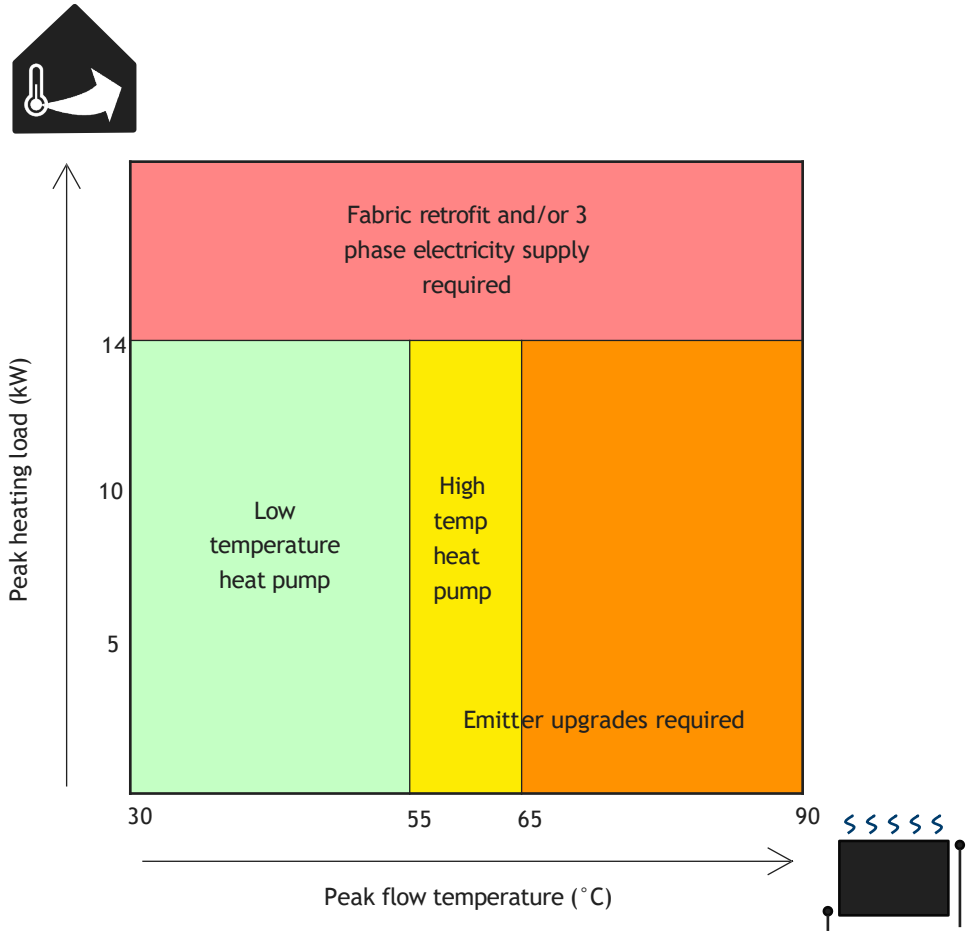
Most heat pumps can provide up to around 12-14kW of heat output on an 80A single phase supply, so if a dwelling's peak heat load exceeds this, fabric efficiency improvements are required to reduce peak heat load, or a potentially costly three phase electricity supply will be necessary to enable use of a more powerful heat pump.

Emitter flow temperature

Low flow temperatures are key to efficient heat pump operation and low running costs, however the heat output of radiators and underfloor heating reduces as flow temperature drops.

This means that to use the low flow temperatures required to unlock the most efficient heat pump operation, either heat emitter sizes need to be increased to compensate, or a homes' peak heat load needs to be reduced by improving the fabric efficiency, or some combination of both could be applied.

*Temperatures quoted are based on the MCS heat pump calculator



Relationship between peak heating load and emitter flow temperature. If a dwelling's peak heat load is above 14kW, it is likely that the heat load will need to be reduced, otherwise a 3-phase electrical supply may be required. Flow temperatures above 65°C usually mean that heat emitter upgrades are required to enable use of a heat pump, however ideally peak flow temperatures should be kept below 45°C for the best efficiencies.

The importance of predicting peak heating load

Methods to predict peak heating load

Predicting peak heating load is important for correct sizing of heat pumps, heat emitters, and electrical supply capacity, yet it can also be an area of considerable uncertainty. The main methods that can be used include:

1. MCS heat loss surveys are required for MCS accredited installations. These can cost several hundred pounds and typically take a couple of hours to do room by room heat loss calculations. Accuracy can be erratic as it depends on the assumptions used by the installer.
2. Energy modelling can also be carried out using other software such as PHPP. This would be more common to provide a second data point where there are multiple homes of a similar type.
3. Metered energy use can be combined with known data on internal and external temperatures, for example using the coldest day or week of the year, or degree day data, to work out a dwellings heat loss parameter and peak heat load.

Heating loads can vary

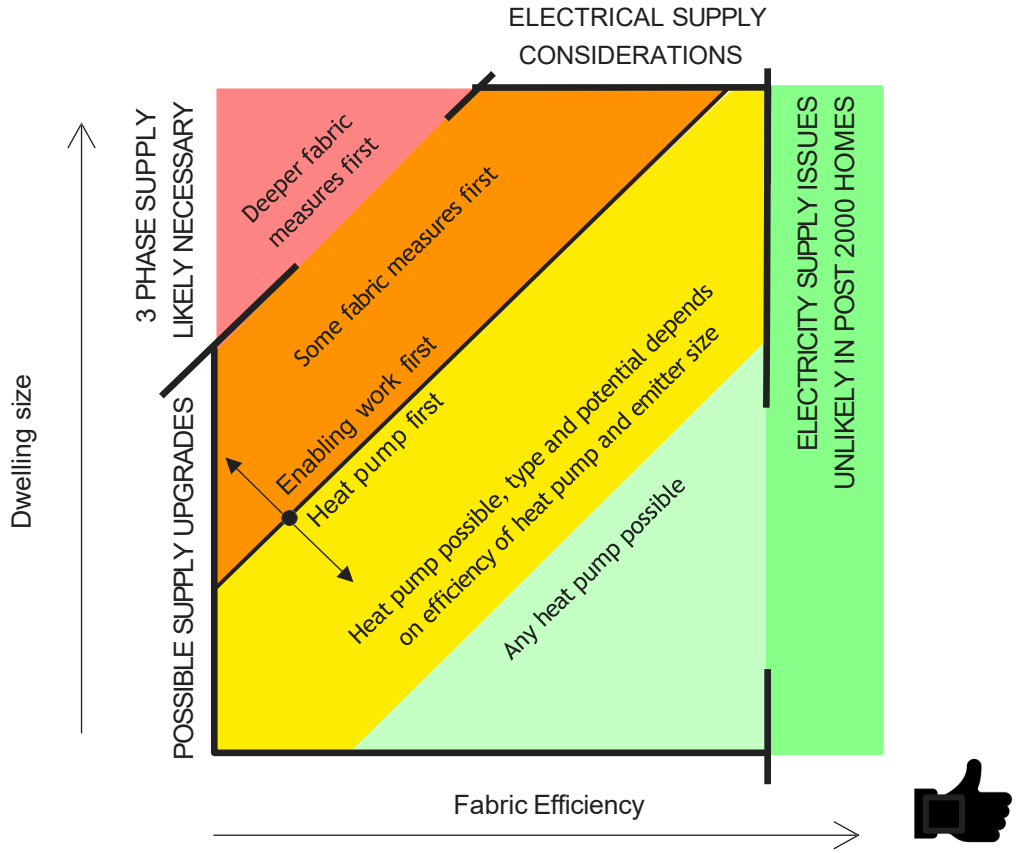
Heating load depends on various individual factors, including user behaviour and perceived thermal comfort and level of activity, ability to zone areas in the home, occupancy patterns, exposure and form.

Dwelling size and fabric efficiency are simple indicators of peak load

The image to the right illustrates that the smaller the volume and more efficient a building's fabric, the lower the likely heating load. Heat pump installations in homes with lower heating loads may be expected to be simpler and less expensive than for large inefficient homes where fabric improvements are likely required. There is a large range in the middle where minor fabric upgrades may be necessary or beneficial.

Electricity supply capacity should also be checked

For the largest and least efficient properties, a 3-phase electrical supply may be required. For most properties built post 2000 it is likely that no supply modification is required. For the rest of the properties, it is important to check that an 80Amp supply is available.



Heat pump readiness matrix – large and inefficient homes toward the top left are likely to need fabric retrofit measures and/or a three phase supply. Homes toward the lower right are expected to be heat pump ready, and most built since 2000 are not expected to need electrical supply upgrades. Many homes in the central bands are likely to be heat pump ready once their electrical supplies are upgraded to the standard 80A offered in Cornwall, with larger less efficient dwellings requiring more fabric measures first. Heat emitter upgrades may not be necessary in all homes but are often desirable to improve efficiency and reduce running costs.

Appendix 2.6

Decarbonisation Pathways

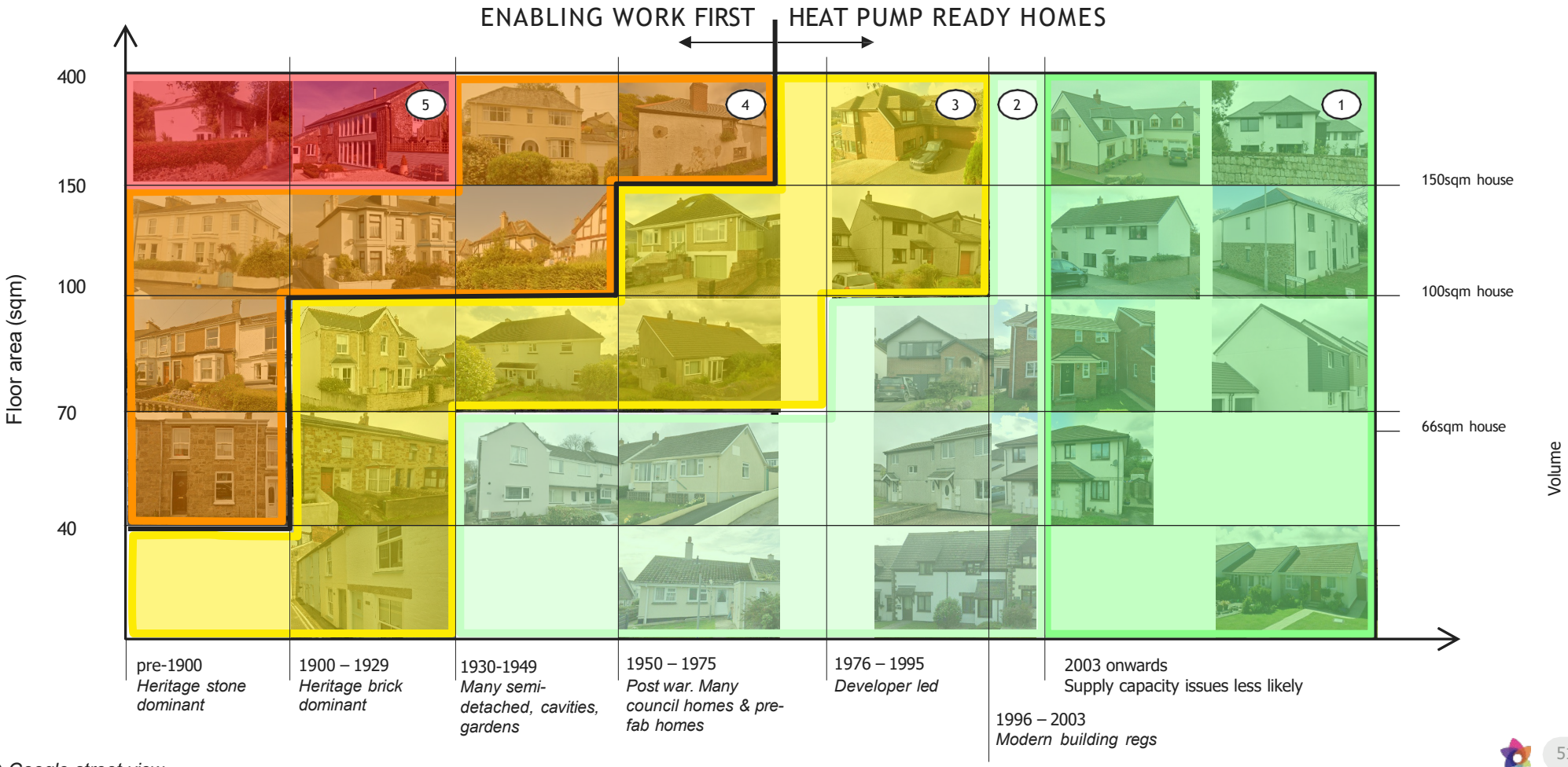
This section sets out the approach to assessing Cornwall's homes, presents example route maps for key archetypes and explains the supporting energy modelling.

Different homes need different decarbonisation approaches

Fabric efficiency and volume

The relationship between fabric efficiency and volume and space heating load has been introduced. While age is an imperfect proxy for fabric efficiency, it is possible to broadly group Cornwall's housing into age and size bands and estimate how easily a heat pump could be installed in homes. The diagrams to the right show example properties of different ages and sizes. The properties to the left are the oldest and properties at the bottom are the smallest.

Properties less than <100sqm were found to have more compact forms. In the newer band, post 1996, there is less of a distinct difference in complexity of form. Points in time where significant changes to construction have occurred are shown as 1930, when cavity wall construction was used more consistently, and 1996 which indicates the start of modern building regulations, with better fabric requirements. From 2000 electricity supply capacity issues are less likely.



Images © Google street view

Decarbonisation pathways for heat pump ready homes

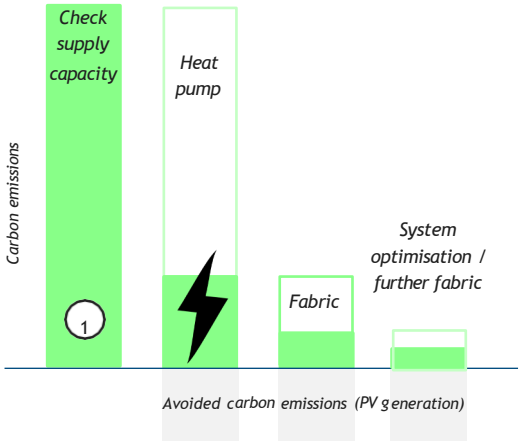
The bar charts below give examples of the three potential decarbonisation pathways for Heat pump ready homes

Pathway 1 for a heat pump ready home. Post 2000 homes are unlikely to need an upgrade and can follow the 'Connect and Notify' process.

Example homes:




Images © Google street view

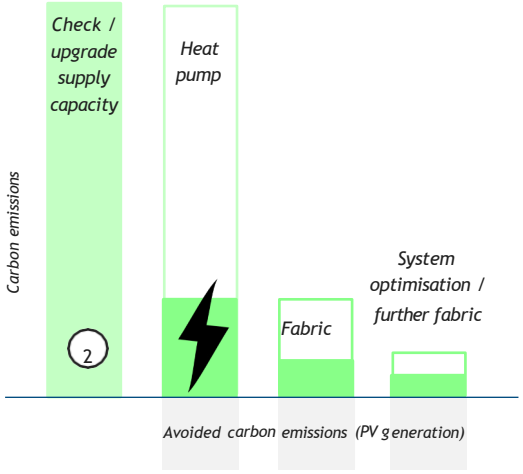


Example carbon reduction for a heat pump ready home post-2000

Pathway 2 for a heat pump ready home, but check supply capacity and follow the 'Apply to Connect' process to resolve any issues.

Example homes:



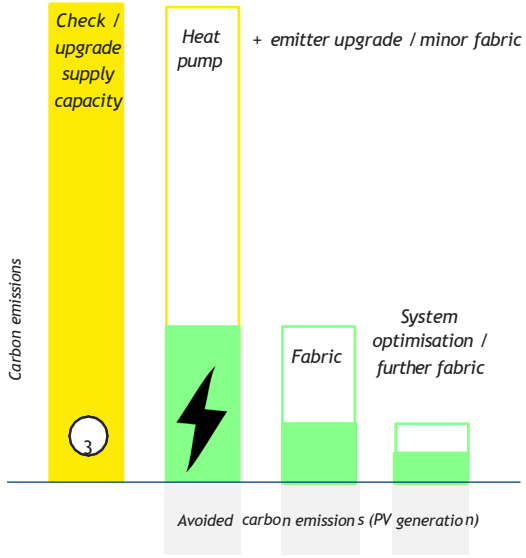



Example carbon reduction for a heat pump ready home pre-2000

Pathway 3 for a close to heat pump ready home, with heating emitter upgrades. Check electricity supply capacity and follow the 'Apply to Connect' process to resolve any issues.

Example homes:



Example carbon reduction for a close to heat pump ready home

Heat pump ready example | Step 1

Low carbon heat

Air source heat pump will need to be installed at the earliest possible stage. These will need to be located near external walls or roof to minimise duct lengths.

Hot water tank for heat pump located inside building

Heat emitters and pipework may need to be upgraded to deliver acceptable efficiencies. Often this can be done on a room by room basis.

Electricity supply capacity should be assessed using the Energy Network Associations application process for heat pumps, and will generally be upgraded for free by the distribution network operator if necessary.

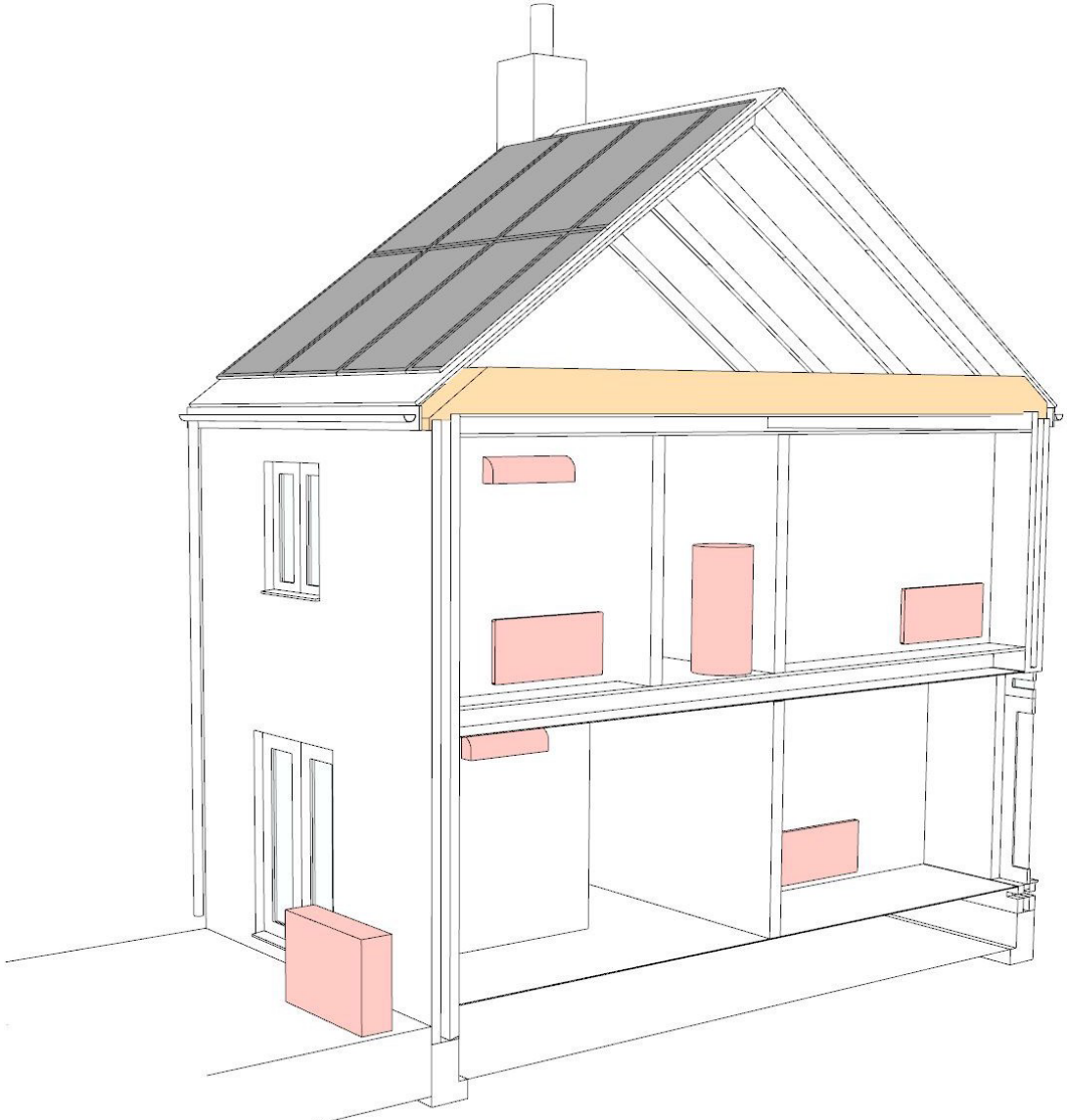
Building Fabric

Loft or rafter insulation to be topped up or fitted if not present, ensuring adequate ventilation below rafters and continuity with cavity wall insulation.

Radon - Existing vents to ground floor maintained. Radon risk assessment carried out, fit underfloor ventilation system if necessary.

Generation

Solar photovoltaic panels should be fitted where possible, generally sized to meet annual demand with possible allowance for future electric vehicle charging.



Summary of measures required for the first phase of retrofit works. Replacement of fossil fuel heating with a heat pump is the main priority, however basic fabric insulation measures such as loft insulation should be carried out. Radon risk should be assessed and mitigated.

Heat pump ready example | Step 2

The second phase of works involves a range of improvements to the building fabric and ventilation systems to further reduce energy demand, improve comfort and indoor air quality. Easy-win measures that may affect heat pump sizing could be brought forward to step 1 if funding is available.

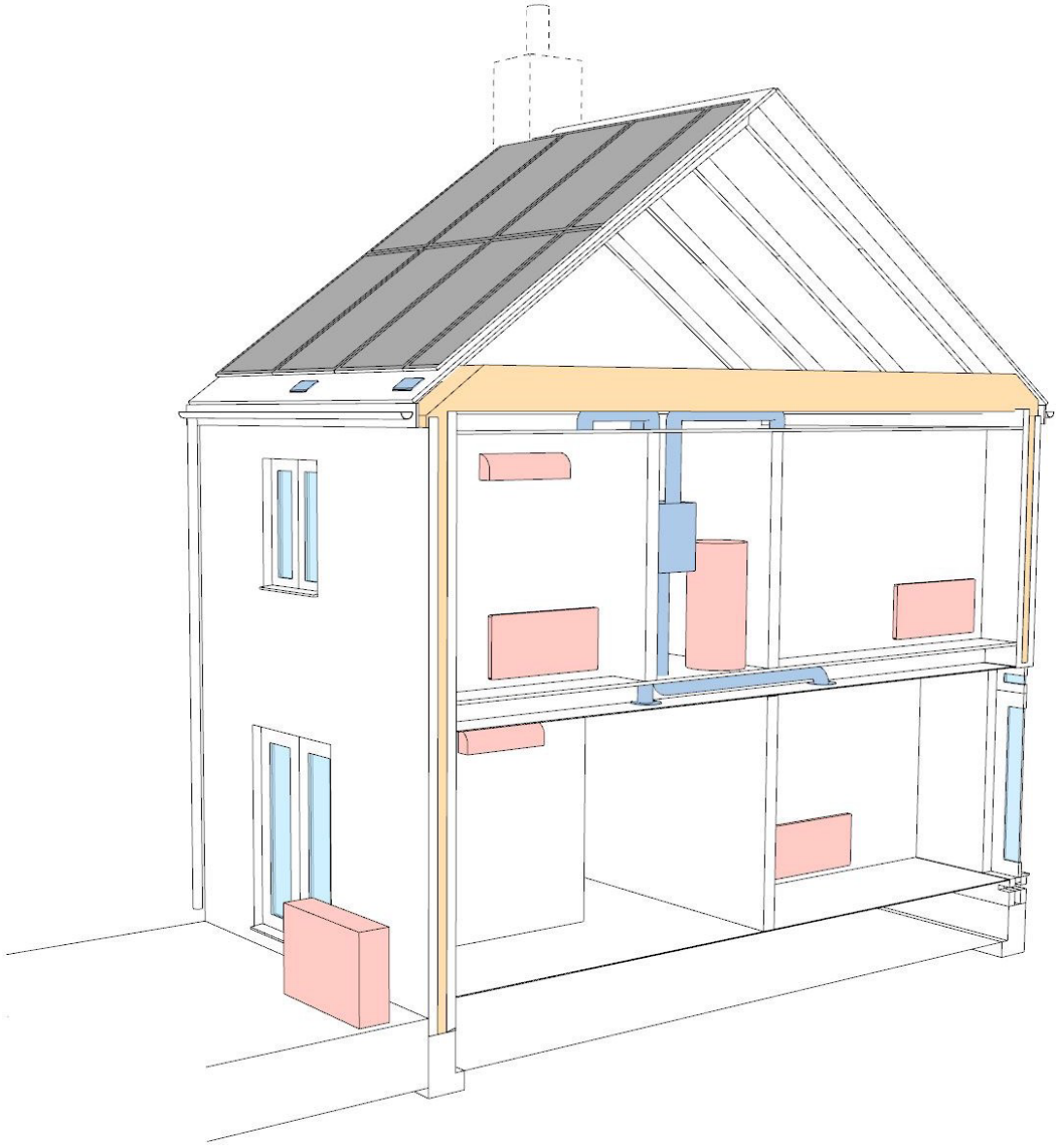
Building Fabric

Cavity wall insulation – fit insulation if not present and appropriate for dwelling, check insulation already fitted and top up or replace if necessary. Protection from driving rain such as a rainscreen may need to be fitted to exposed facades.

Windows and doors – good quality double or triple glazed units, installed in centre of insulation line. Ventilation improvements should be carried out at same time.

Airtightness - draft proof around junction with floor, windows and doors. Consider junctions at corners, roof and ground.

Ventilation – fit mechanical ventilation with heat recovery, close to an external façade. Ducts likely to be located on wall or roof. Vent provides extract to Kitchen and WC and supply air to living spaces.



Summary of measures required for the second phase of retrofit works, which focuses on further improvements to the building fabric and ventilation.

Heat pump ready example | Step 3

The third phase of works involves additional improvements to the building fabric to further reduce energy demand and improve comfort.

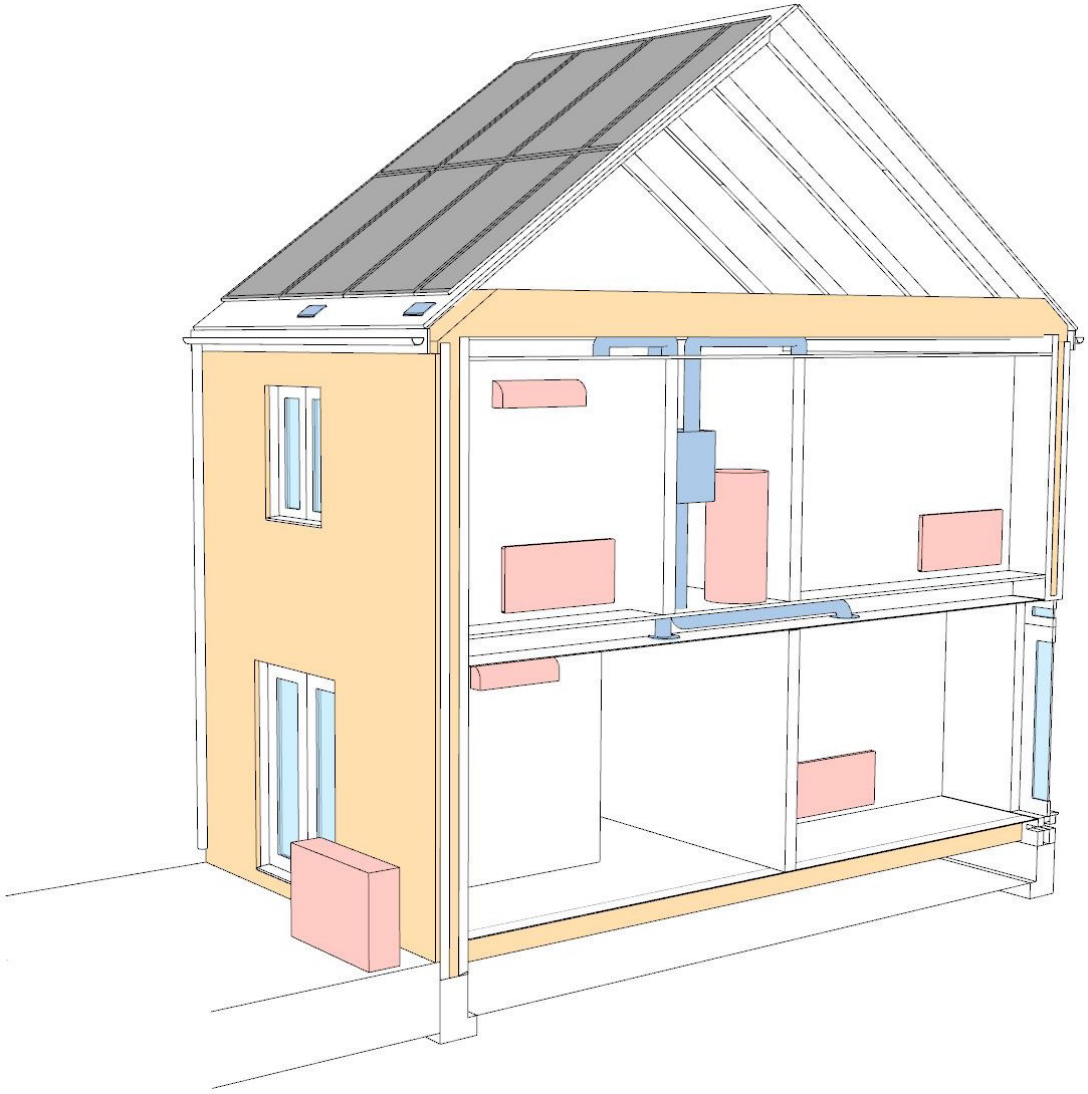
Building Fabric

Floor insulation – insulate concrete floors above, where access levels allow. Insulate under raised timber floors, weatherproof insulation can be added between the floor and the ground.

External wall insulation - on all façades. Consider junctions at corners, roof and ground.

Airtightness – seal concrete floor to wall joint while insulating floor, or fit an airtight membrane to the warm side of the floor insulation after it is installed.

Remove chimney to improve airtightness and remove risk of roof leaks.



Summary of measures required for the third phase of retrofit works, which focuses on final improvements to the building fabric.

Decarbonisation pathways for enabling work first homes

The bar charts below give examples of the three potential archetypal decarbonisation pathways for enabling work first homes.

Pathway 4 has some fabric measures and emitter upgrade as a first step before an efficient heat pump is viable, potential system upgrades may be necessary or could reduce the fabric works necessary as a first step. Check electricity supply capacity and follow the 'Apply to Connect' process to resolve any issues

Example homes:



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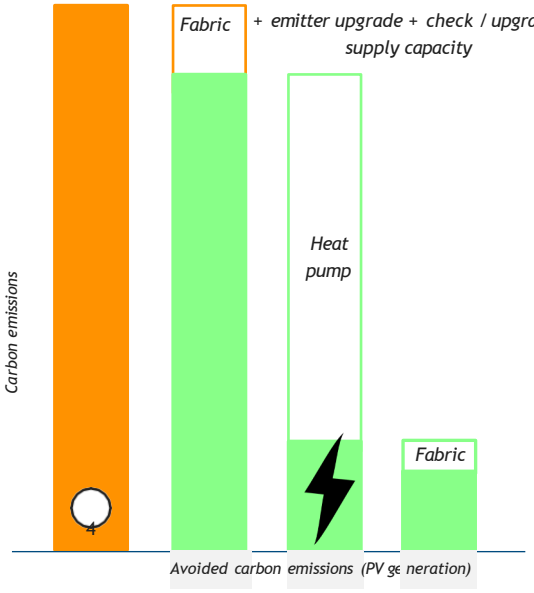
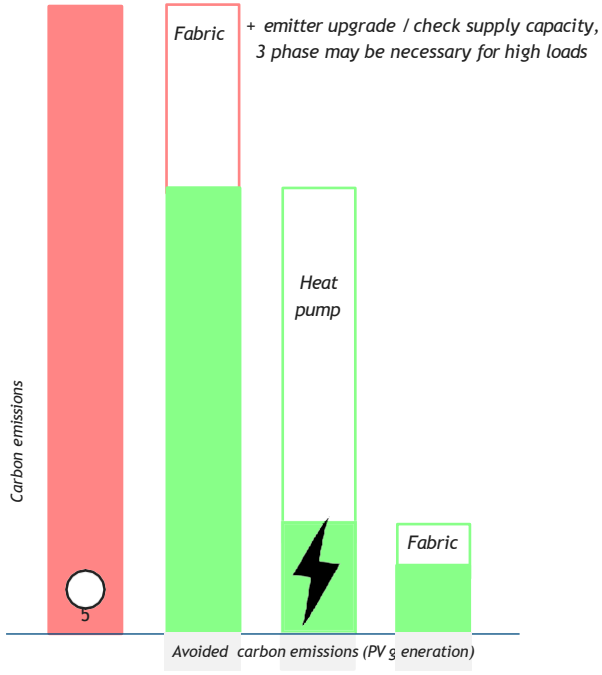


Example with some fabric measures and emitter upgrade as a first step.

Pathway 5 for homes with major fabric measures required before a heat pump is possible. Potential system upgrades may be necessary or could reduce the fabric works necessary as a first step. Check electricity supply capacity and follow the 'Apply to Connect' process to resolve any issues. A three phase supply may be necessary where heating load cannot be reduced below 12kW.

Example homes:

Example carbon reduction for homes with major fabric measures required before a heat pump is possible.

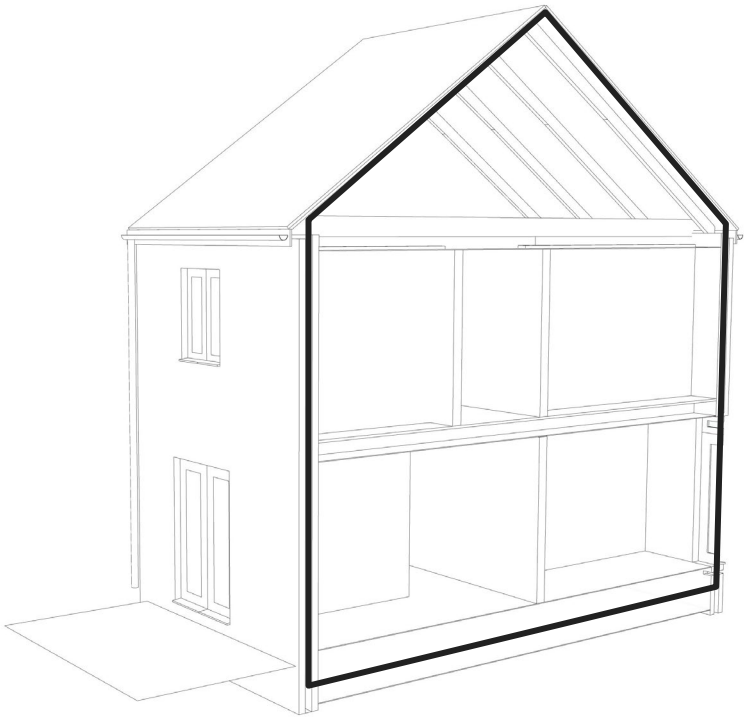
Modeling heating load for small homes | introduction

The prevalence of small homes and opportunities

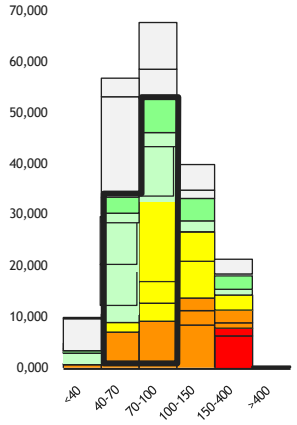
Small homes under 100sqm, represent nearly two thirds of houses in Cornwall and more than half of homes in Cornwall. They are a key opportunity for retrofit as they are likely to have lower space heating loads and are relatively simple in form compared to larger homes. There also a higher proportion of residents in fuel poverty living in smaller homes.

Modelling heating load for a range of scenarios

Energy modelling has been carried out using a 70sqm, which is representative of a small house in the middle of the range. Typically, energy modelling uses a particular example building and the assumptions about the building fabric and ventilation are specific to that building, as well as shading conditions, orientation and whether the home is detached, semi-detached, or in a terrace. For this modelling we have chosen a range of assumptions that encapsulate all likely scenarios for a range of buildings. This helps us to understand the range of space heating loads for buildings with a similar form.



Basic form of 70sqm house used as one of the models



Proportions of homes of different sizes and eras from EPC data.

Examples of 40-100 sqm homes from different eras. Oldest to the left, newest to the right. The boxes show the example forms used in the modelling.

Images © Google street view

Modeling heating load for small homes | wide range assumptions

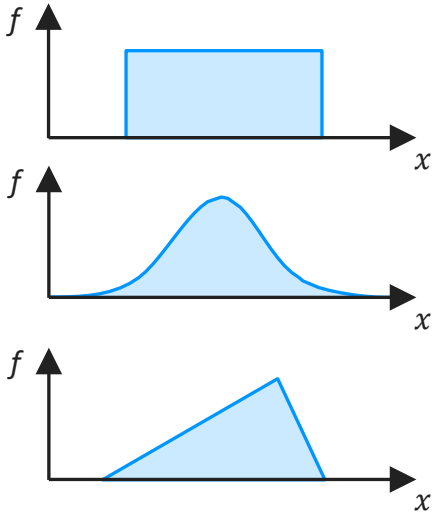
Choice of parameter ranges

The chart on the right gives a range of building fabric assumptions that have a high impact on space heating demand and peak load and are representative of a range of building ages and fabric standards. Building siting is considered by varying the orientation and shading. The impacts of sharing walls with neighbours are also captured by modeling the home types: *detached, semi-detached, and terraced.*

Modeling method

The range of parameter values are applied by running the model multiple times and picking a random value from the ranges described in the chart to the right (for the widest range iteration). The random values were picked assuming a uniform distribution, which means that there would be an equal likelihood of picking each of the possible values in the range. Normal (gaussian) and triangular distributions have been tested as these potentially give a more realistic spread of results, however they can underestimate the extremes. Uniform distributions are useful in this exercise to pick up the more extreme possibilities for heating load for these house types.

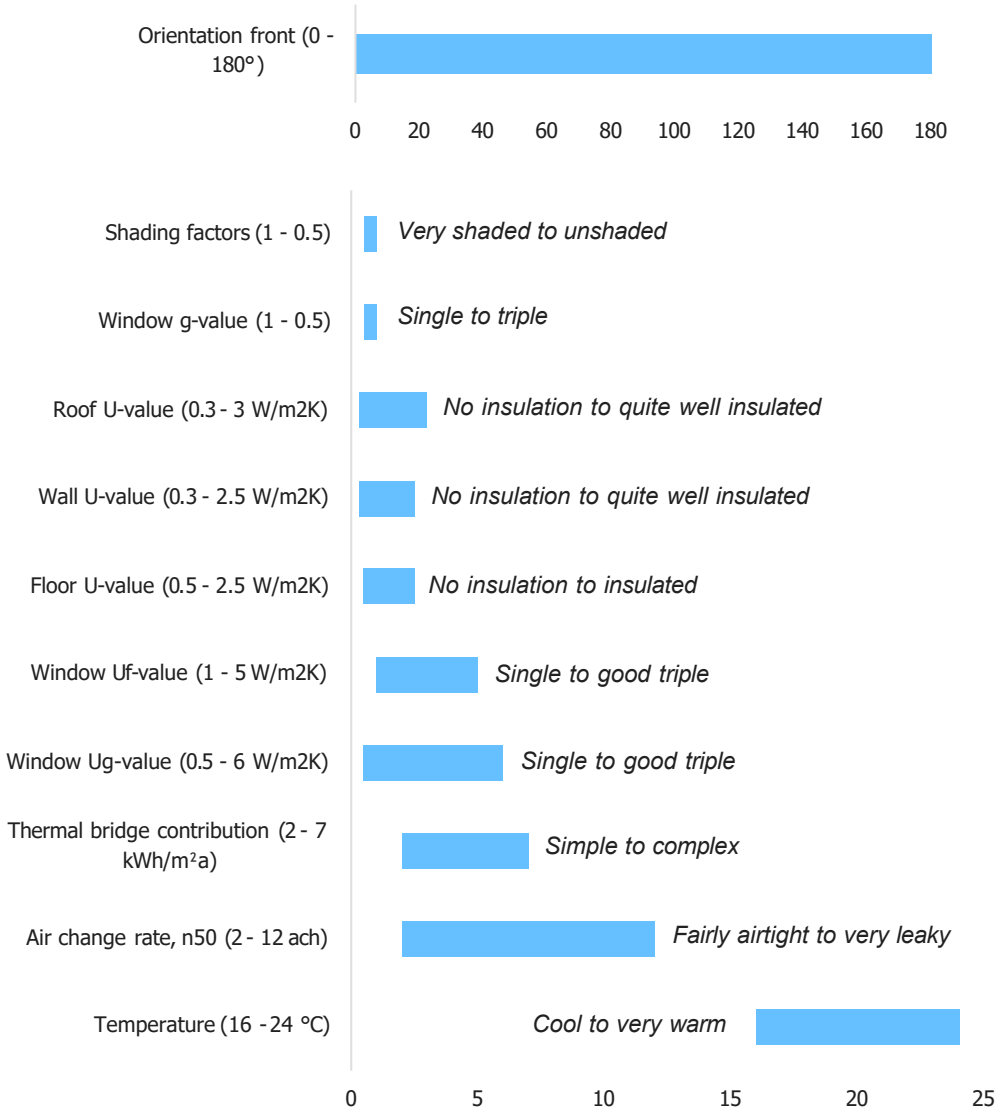
Distribution types:



Uniform: values are picked evenly across the range, giving a wider spread of results. Extremes of the ranges may be over-represented.

Normal: more values are picked from the middle of the range, giving a tighter spread of results. The extremes of the ranges are continuous, and the limit cannot be selected. The extremes may also be under-represented, and the center may be skewed.

Triangular: more values are picked from the median of the range, which can be useful for assumptions that are skewed, and the limits can be fixed. This gives a tighter spread of results, and the extremes of the ranges may be under-represented.



Key parameter ranges used in the modelling for the homes. Additionally, the house types detached, semi-detached, and terrace were all modelled

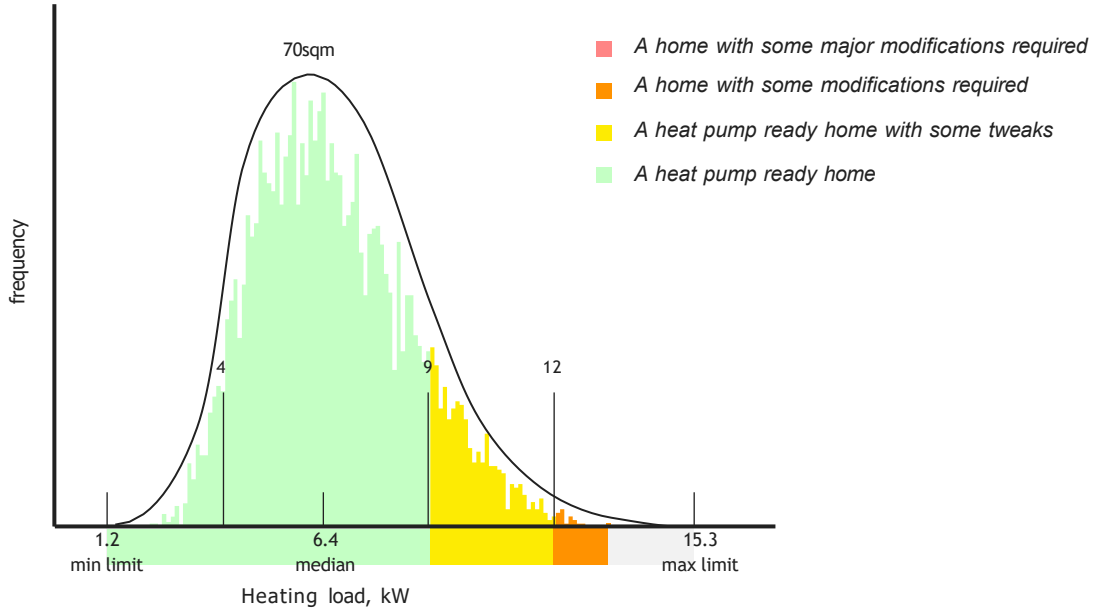
Modeling heating load for small homes | results of modelling

Small home with wide U-value ranges

The plot to the top right shows the heating load results for the 70sqm house with a very wide range of U-value inputs as shown on the previous page. The plot to the bottom right also shows the example of a larger more complex house of 100sqm (pink), and both house with tighter U-value assumptions, with a limit of 1.0 W/m²K instead of 3.0 W/m²K. The wider range represents much older properties.

For the smaller house it is likely that the vast majority of these are heat pump ready, pending minor adjustments and electricity supply capacity assessment. A high number of poor parameters, e.g. in the higher of the ranges shown on the previous page, should flag that fabric measures may be necessary before heat pump installation.

For the larger home with the wider range of U-values, a higher proportion of the homes would need fabric measures prior to heat pump installation, but the majority would need only minor, or no fabric intervention before heat pump installation.

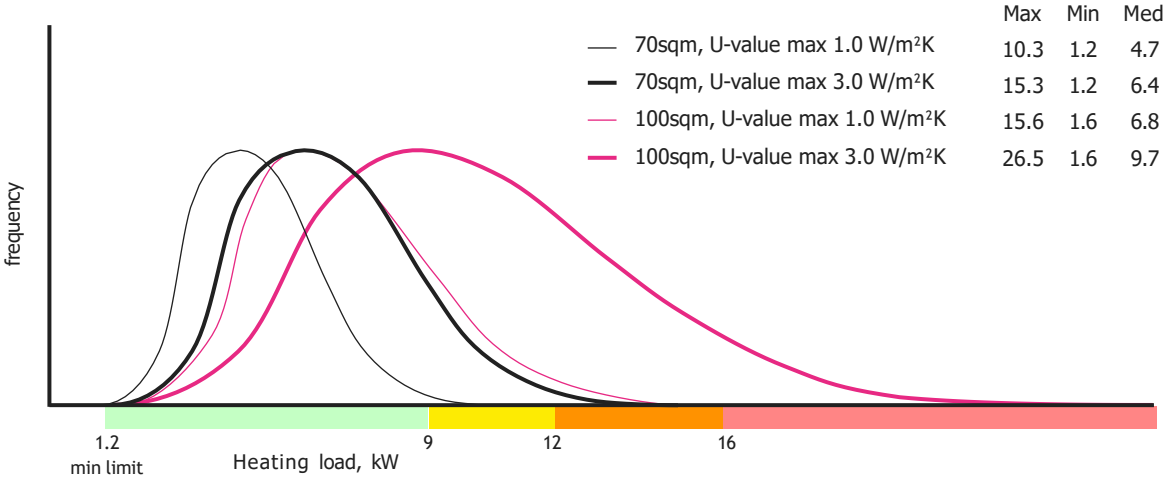


Heating load distribution results for 70sqm house with wider U-value limits

Notes on method

Note that the distributions shown do not show the expected distribution of all houses of this type in Cornwall but give an indicative likelihood of performance for a single house with the same form and a range of fabric performance. This can be thought of as scenario testing, for the ranges of variables shown on the assumptions page.

The models were run 5000 times for each house type and U-value range. We note that correlations were not considered, so for example, no assumptions were made about the co-incidence of poor wall fabric with poor roof fabric, as data on upgrades is sporadic. The large range of U-values using a uniform distribution was considered to give conservative results, as the more extreme possibilities are over-represented given that the actual U-value spreads are likely to follow a normal distribution (e.g. according to the parity report).



Heating load distribution results for two house sizes, and two different U-value limits

Appendix 3.0

Capital costs and funding

The wider funding environment for retrofit work.

Costs I Co-benefits

Cost of measures and social value

The most common method of rationalising the cost of retrofit is to divide the capital cost by the annual energy bill savings to give the number of years it will take to payback. But what is a good payback? If carbon reductions are our primary goal, we might consider the cost per tonne of carbon saved. However, these figures will depend hugely on the carbon factors used, the building's heat source (which could change) and the timeframe over which they are calculated. It can quickly become difficult to compare like with like and neither approach places any value on the second-order benefits such as job creation or health and wellbeing for residents.

There are several second-order effects of retrofit which provide public value and social return on investment. There are a few methodologies available to establish the public value of a project. Social Return on Investment (SROI) is an organisational method of accounting for value creation, primarily social or environmental value. Using SROI calculations may give a more holistic assessment of the value of the work when assessing the need and benefit of a project.

Health

Increasing thermal comfort and improving indoor air quality will have a positive impact on health, especially the vulnerable. The IEA and the OECD suggest health improvements might account for 75% of the overall value of improving the energy efficiency of buildings.

Wellbeing

HACT's Social Return on Investment calculator suggests that an improvement of 3 EPC bands can improve individual's wellbeing, equivalent to £651 per year.

Energy bills and fuel poverty

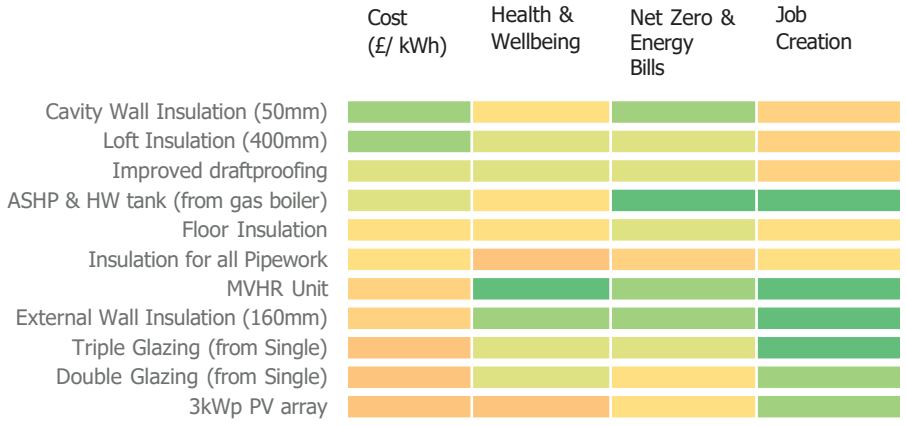
Targeted high energy savings will reduce bills and take more people out of fuel poverty, reducing the need for financial support.

Local economy and job creation

There is a fantastic opportunity for job creation in Cornwall. Parity Projects estimate that it can create 2,500 full time equivalent jobs to decarbonize the whole building stock

Society's cost to achieve Net Zero

There is finite supply and delivery capacity of renewable energy via the grid. The less grid capacity we will need to achieve net zero, the lower infrastructure costs will be.



A subjective assessment of the impact of retrofit measures on the second-order effects which could help establishing priorities.

Costs I Council-owned stock

A carbon zero future for Council owned stock will require significant investment and in reaching this ambition the lowering of energy bills for our tenants will drive our spend and priorities

Planned investment using the Homes Revenue Account (HRA) using the efficiencies of aligning maintenance programmes will be essential. When establishing the business case for retrofit it is important to develop a financial strategy that can, in the long term, be supported by the HRA. The business case for retrofitting council-owned stock should be reviewed alongside current investment for Decent Homes, building safety works, and maintenance and repair programmes. Efforts should be made to co-ordinate these works as much as possible to reduce costs. The business case needs to identify and assess the broader financial benefit to retrofit.

It is inevitable that the capital cost required will exceed capital funds available in the near term if the work is to progress at pace. It will therefore be important to seek out additional investment opportunities to enable this transition as well as maximising the use of government funding streams available for social housing.

Consider the cost of retrofit in context

While the level of investment for retrofit represents a huge challenge, it is worth noting that there is already a considerable amount of money being spent on running and improving our homes.

Social housing costs

Up to £10,000 per home

was spent over the last 10 years on more than 1 million homes to meet the Decent Homes standard. Social housing providers also have significant budgets for maintenance and repair, with building safety works now a priority.

Private rented property repairs

£1,000 per home

is the average spend by landlords each year on refurbishments, replacing or repairing boilers and fixing structural damage.

Home improvement market

£2,100 per home

is the average annual spend on renovation and home improvements. The UK spends £7billion on DIY supplies.

Energy costs and fuel poverty

£4.2 billion a year

is spent on energy bills by social housing tenants in the UK. Schemes such as the Warm Homes Discount help with these payments.

HACT

HACT have developed a methodology to measure the carbon savings and social value created through retrofit activity and to assign carbon credits to projects, which can be used to secure additional funding for retrofit projects.

Suggestions to frame the business case for retrofit

Cornwall Council could use this structure to develop an investment and business case for retrofit.

- Strategic context - How well does the project fit into the council's strategic priorities?
- Affordability - Are financial resources available within existing sources of funding for the proposed project and what will be the net impact of the options under consideration, in terms of cost to the organisation versus benefits?
- Public value - Is there a consideration of the wider benefits compared with costs to UK society of the proposals? This is not the same as the net effect on the local authority and it considers the same range of options as the financial appraisal but from a wider social perspective.
- Value for money defined as 'Public value divided by financial impact'. It measures the social benefit of an option per pound of public cost. Most public sector organisations will need to develop a business case to secure investment.

Costs | Principles for affordable decarbonisation

Affordability is a significant barrier to decarbonisation. Grant funding is very limited, so finding cost effective ways to achieve decarbonisation is essential to secure progress for most homes. These principles are relevant both in the case of increasing the size of the able to pay market, and maximising the impact of support funding used to assist those who are unable to pay.

Heat decarbonisation

The boiler upgrade scheme is potentially leading to inflated costs for eligible technologies such as monobloc air source heat pumps. Potential strategies to reduce the cost of heat decarbonisation include:

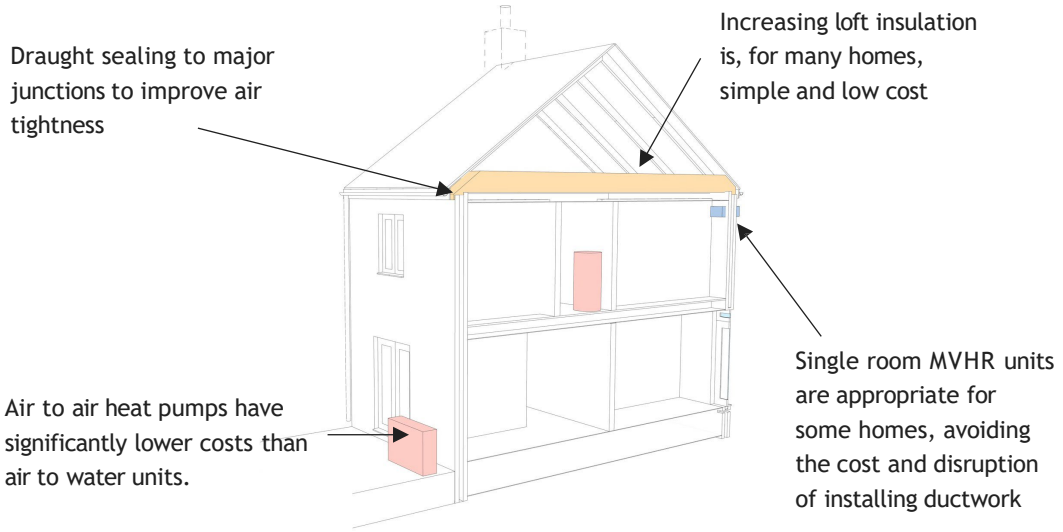
- Specifying air to air heat pumps in suitable properties. These are a lower cost alternative to the more common air to water type.
- Supporting heat pump installer training may help to reduce or limit costs by increasing supply relative to demand.

Building fabric and ventilation

Insulating lofts and improving airtightness are effective measures to reduce space heat demand and are generally some of the lowest cost measures that should be implemented in a cost-optimised approach. Providing adequate ventilation is essential, however mechanical ventilation systems with heat recovery can be challenging and expensive to install in existing buildings. Rationalised system designs can reduce duct costs while retaining efficiency, and small, single room units may be appropriate for some dwellings. Where funding is limited positive input ventilation may be an appropriate short to medium-term solution.

Solar photovoltaics

Prices for solar photovoltaics reached historic highs during the energy price crisis, but appear to have peaked and are presently falling. Costs can be constrained by opting for simpler systems without battery storage, which can be installed at a later date if necessary.



Example of a cost-optimised approach to decarbonisation. The dwelling is heated with an air-air heat pump and water heating is provided by a direct electric hot water tank that is recharged using an off-peak electricity tariff. Basic improvements have been made to the building fabric by insulating the loft and improving airtightness. Intermittent extract fans have been replaced with single room mechanical ventilation with heat recovery (MVHR) units. This approach could cost as little as £4,000-£5,000, while addition of a solar photovoltaic system would add another £6,000-£10,000.

Appendix 3.1

Operating costs

This appendix explores the three main approaches to ensure that heat decarbonisation leads to long-term operating cost reductions for occupants: electricity tariffs, heat pump efficiency, and solar photovoltaics.

Operating costs | Electricity tariffs

Electricity pricing is different to oil and gas

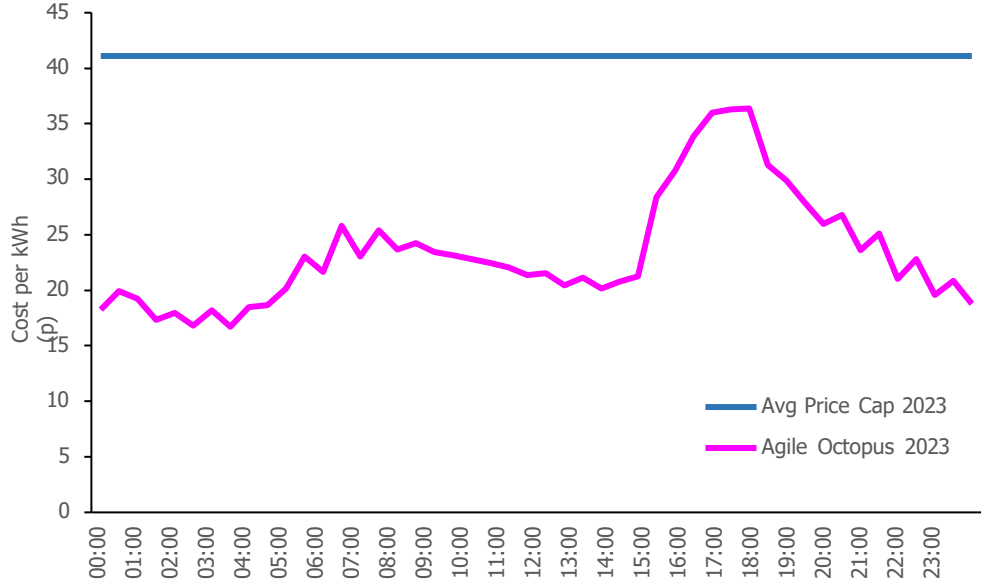
Although fossil fuel pricing can be volatile, prices paid by consumers for heating fuels usually vary over a period of weeks or months, as the wholesale prices of fuels change. Electricity prices by contrast can vary dramatically from one half hourly period to another as the UK's generation mix changes. During times of high wind or solar generation, prices often drop and can even become negative. Conversely, prices are usually higher when there is less wind and sun.

Electricity tariff options

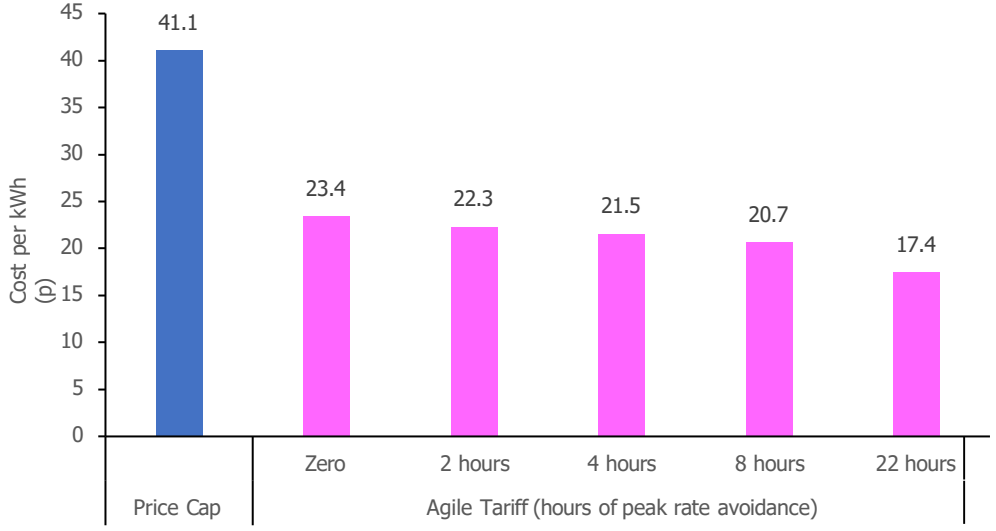
Consumers can choose to avoid frequent price variations by opting for a standard fixed tariff or variable tariff, or they can opt into a variety of time-of-use tariffs if they want to take advantage of these price fluctuations. Traditionally the main time-of-use tariffs were economy 7 and economy 10, which provide 7 or 10 hours of reduced price electricity for the same time period each day. With the advent of smart meters it has become possible for power companies to offer a wide variety of different time-of-use tariffs, designed for different customer needs such as heat pumps and EV charging. The purest of these tariffs, such as Octopus Energy's Agile tariff, effectively track the wholesale power price for each half hourly period.

How can this make electrification more affordable?

It is often possible to schedule when electricity demand from heat pumps and other electric heating systems occurs. For example, with a large hot water tank, water heating can be scheduled to occur during windy overnight periods in the winter when electricity is cheap due to surplus wind generation, or peak sun hours during the summer when surplus solar energy pushes prices down. Even if a heat pump is providing continuous space heating in the middle of winter, most homes can set their thermostats a couple of degrees lower during peak pricing hours to lower the average price they are paying for electricity. Eliminating gas supplies also removes standing charges, leading to further savings, currently around £108 a year.



Annual average half hourly prices for electricity from Octopus Energy's Agile tariff were significantly lower than the average price cap rate for standard fixed and variable tariffs in 2023. A similar pattern existed during 2018, 2019 and 2020 (ie years excluding the energy price crisis, which disrupted normal pricing).



Dynamic time-of-use tariffs can be significantly cheaper than price cap rates for standard fixed and variable tariffs. Modelling of half-hourly pricing for the Agile Octopus tariff in 2023 shows it cost 43 - 58% less than the average price cap rate, depending on how many peak hours could be avoided.

Operating costs | Electricity metering

Smart Meters

Smart meters provide the fullest access to a broad array of electricity tariffs, including those that vary dynamically for each half hourly billing period. It is likely that these tariffs can offer the best prices for both running heat pumps and exporting excess solar electricity.

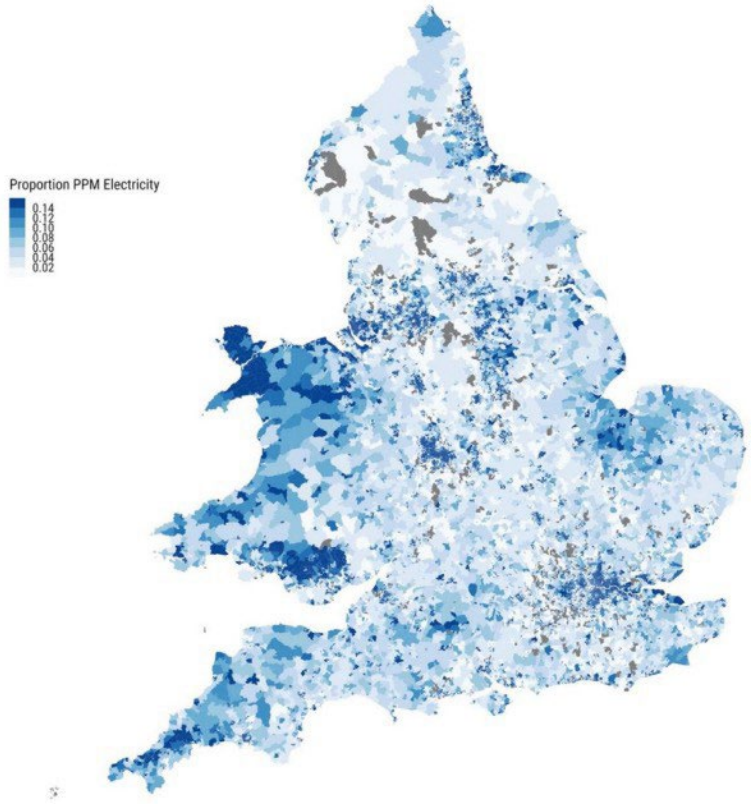
Smart meters are usually fitted at no cost to the resident, but waiting times can be several months. Rolling out smart meters to any households that do not yet have them is therefore recommended as a low-regrets measure to facilitate affordable decarbonisation of housing.

Prepayment Meters

35,897 homes in Cornwall had prepayment meters in 2017, with many areas recording above national proportions. Historically, prepayment meters were physically installed by electricity suppliers when customers fell into debt. With the advent of smart metering, this switch can often now be made remotely.

The electricity from prepayment meters is usually more expensive than other types of billing and metering arrangement. This has several implications for housing decarbonisation strategy:

1. Solar panels can deliver above average savings, and should be a priority for homes with prepayment meters.
2. Heat pumps must operate with higher efficiencies, or greater amounts of free solar electricity, to equal or beat the cost of legacy oil and gas heating systems.
3. Homes with direct electric heating and prepayment meters could significantly reduce their heating costs by installing a heat pump, however these are a lower priority for emission reductions.
4. Water heating should generally be timed for the middle of the day, where solar is present, or for off-peak times if on a dual tariff.



Lower super output area data on the percentages of prepayment meters from 2017.

© Ding X, Akimova ET, Zhao B, et al. J Epidemiol Community Health 2024;78:54–60.

Types of electricity meter, from left: prepayment meter, smart meter, digital meter, mechanical meter.

Operating costs | Heat pump efficiency

Heat pump efficiency matters

Heat pump efficiency directly affects operational electricity use and cost. One of the biggest causes of variations in heat pump efficiency is the quality of the design, installation, and commissioning of the overall heat pump system (i.e. the heat pump including the heat emitters and hot water tank, if present). The way users operate heat pumps can also affect efficiency.

Heat pumps that meet good practice standards of design, installation, commissioning and operation can operate efficiently and reliably with lower running costs than oil or gas boilers. However, poorly set-up systems could result in a net increase in costs.

Understanding heat pump efficiency

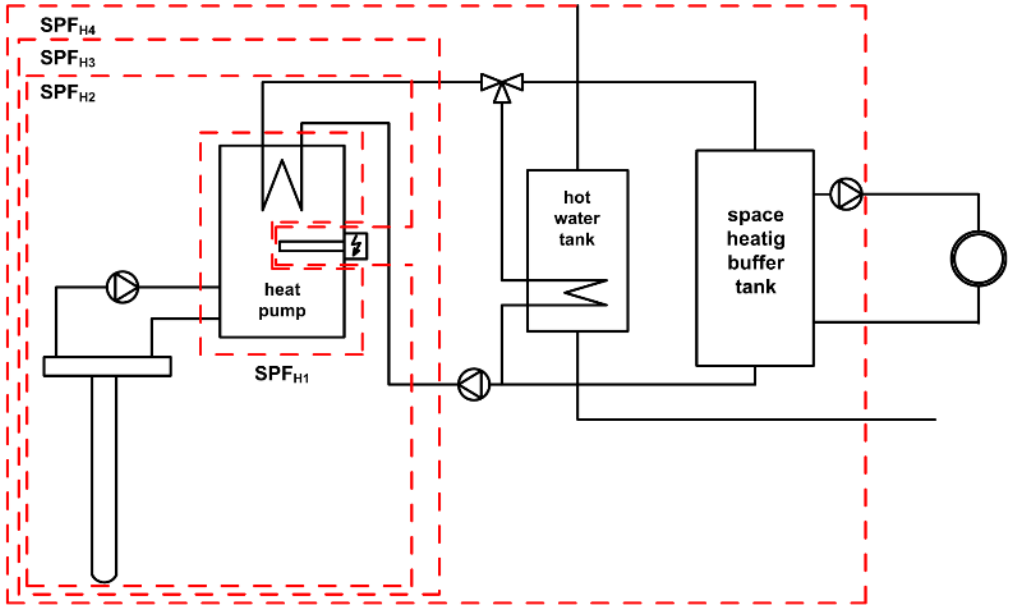
The efficiency of a heat pump, often called the Coefficient of Performance (COP), is a measure of the useful thermal energy output relative to the electrical energy used to power the heat pump.

$$Efficiency = \frac{Thermal\ energy\ output}{Electrical\ energy\ input}$$

Efficiency varies depending on the source and sink temperatures, how hard the heat pump is running relative to its maximum capacity, and whether backup direct electric heating is used.

This means that efficiency varies over time due to the weather and how the heat pump is operated. For this reason, Seasonal COPs (SCOPs) or Season Performance Factors (SPFs) are often used to show the average efficiency over a period of time (usually one year).

Heat pump efficiency can be calculated based on a number of different system boundaries. This report uses the H3 system boundary where possible, as this is the most useful for comparing efficiency with other heating systems.



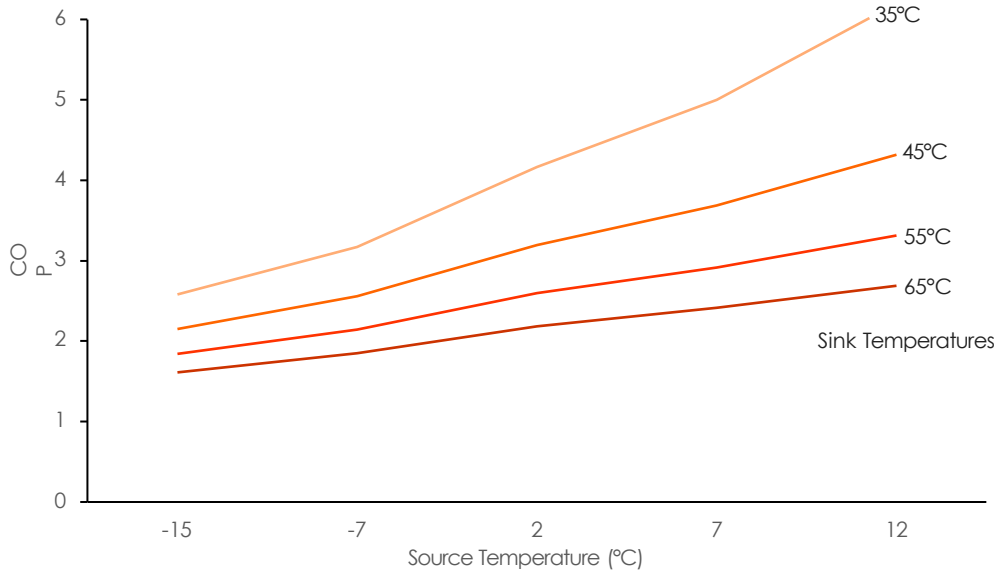
Heat pump efficiency can be calculated using different system boundaries. The H3 boundary is the most useful for comparison with boilers and other heating systems. This includes electricity used for backup heating elements, but does not include electricity required to power heat emitter circulating pumps.
© SEPEMO-Build

Operating costs | Heat pump efficiency

Typical efficiencies and why they vary

Heat pump seasonal efficiencies using the H3 system boundary typically range from 250-450% in the UK climate, when used for a combination of space and water heating. Several factors can affect the seasonal efficiency:

1. Source temperatures - variations in efficiency due to the source temperature occur due to the weather, for example heat pumps that operate mainly during colder periods may be expected to have lower efficiencies.
2. Sink temperatures – the temperature of water output by the heat pump, known as the sink temperature, varies depending on whether the heat pump is providing space heating or water heating, and the relative temperature setpoints for both. Sink temperatures also depend on:
   - The heat emitter area.
   - Whether the heat pump's control logic includes load compensation or weather compensation (for space heat).
   - Whether the heat pump's control logic is interrupted by third party thermostats.
   - Whether the system is hydraulically separated with a buffer tank or low loss header, and if it is, how any secondary circulating pumps are controlled.
   - The type of heat transfer fluid. Glycol has a lower specific heat capacity and higher dynamic viscosity so has higher pumping losses relative to water.
3. Part-load operation – modern heat pumps have variable speed drives so they can operate efficiently down to about 30-40% of their peak capacity. Below this, most units enter less efficient on-off operation.
4. Backup heating – some heat pumps have electric resistance backup heaters fitted, which have an efficiency of 100%. Their operation reduces seasonal heat pump efficiency.



Typical variation in heat pump efficiency with source and sink temperatures. Various aspects of system design, installation, and operation affect the duration of time a heat pump will spend operating at different sink temperatures, therefore also affecting efficiency.

Operating costs | Heat pump efficiency

Strategic importance of heat pump efficiency

As heat pumps are such a core element of Cornwall's housing decarbonisation strategy, a core principle must be to consistently deliver best practice heat pump efficiency. This can primarily be achieved through installer training and consumer education.

Avoiding poor efficiency

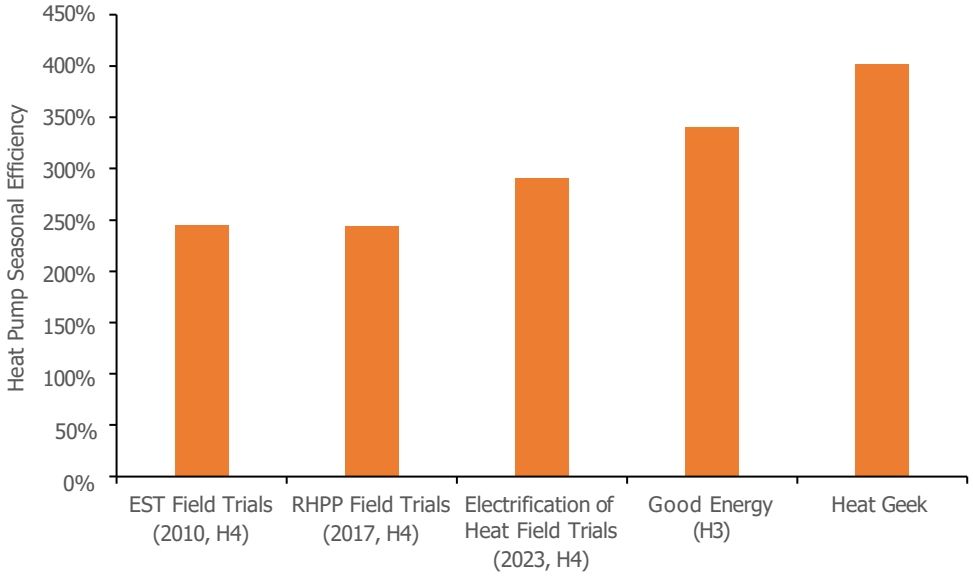
The following measures are key to avoiding the worst-performing systems:

- Accurate heat loss calculations, sense-checked against cold week heating fuel consumption, to ensure correct sizing of heat pump.
- Correct sizing of heat emitters to allow low flow temperatures.
- Setting an appropriate domestic hot water storage temperature.
- Avoiding use of unnecessary electric resistance back-up heating.
- Ensuring primary pipework runs are short and well-insulated.
- Avoiding use of third party thermostats that interfere with the heat pump's control logic.
- Avoiding use of buffer tanks or low-loss headers, and secondary circulating pumps, where not required.
- Using antifreeze valves rather than glycol antifreeze, to reduce pumping losses.

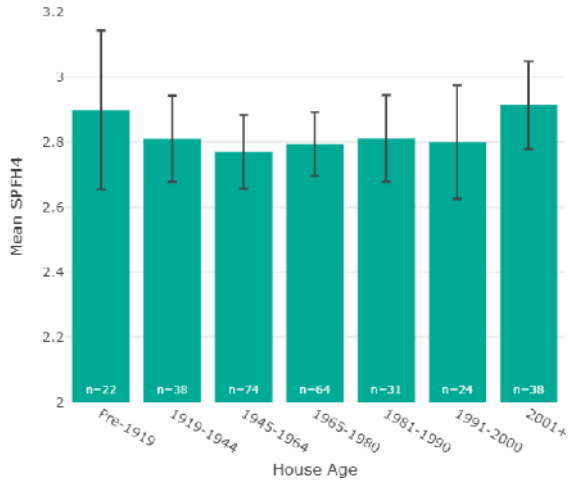
Achieving high efficiency

The following measures can help to fine-tune heat pumps to achieve the highest efficiencies:

- Weather compensation setting readjustment to reduce flow temperatures if possible, based on user feedback.
- Ensuring domestic hot water recharge cycles do not occur with excessive frequency by correctly setting the minimum temperature drop required before a reheat cycle occurs.
- Optimising domestic hot water sterilization cycle settings.



Seasonal average heat pump system efficiencies have increased in more recent field trials and installer data. The reasons for differences in efficiency are also becoming better understood.



Mean seasonal average heat pump system efficiencies using a H4 system boundary measured in the Electrification of Heat field trial. The median for the whole study was 290% and good efficiencies could be achieved in homes of any age. © Energy Systems Catapult

Operating costs | Prepayment meters

Summary

The main report provides a pathway to affordable electrification for a direct debit bill payer. The adjacent graph provides an alternative pathway for a home on a prepayment meter where an occupant is assumed to be home all day. All scenarios use the levels of energy use assumed by OFGEM for energy price cap calculations: 11,500 kWh of heating fuel (assumed to provide 9,775 kWh of heat at 85% efficiency) and 2,700 kWh of electricity. Electricity prices are assumed to be the 2024 Q1 price cap prepayment rate of 28.17p/kWh.

Oil Boiler - £1,898

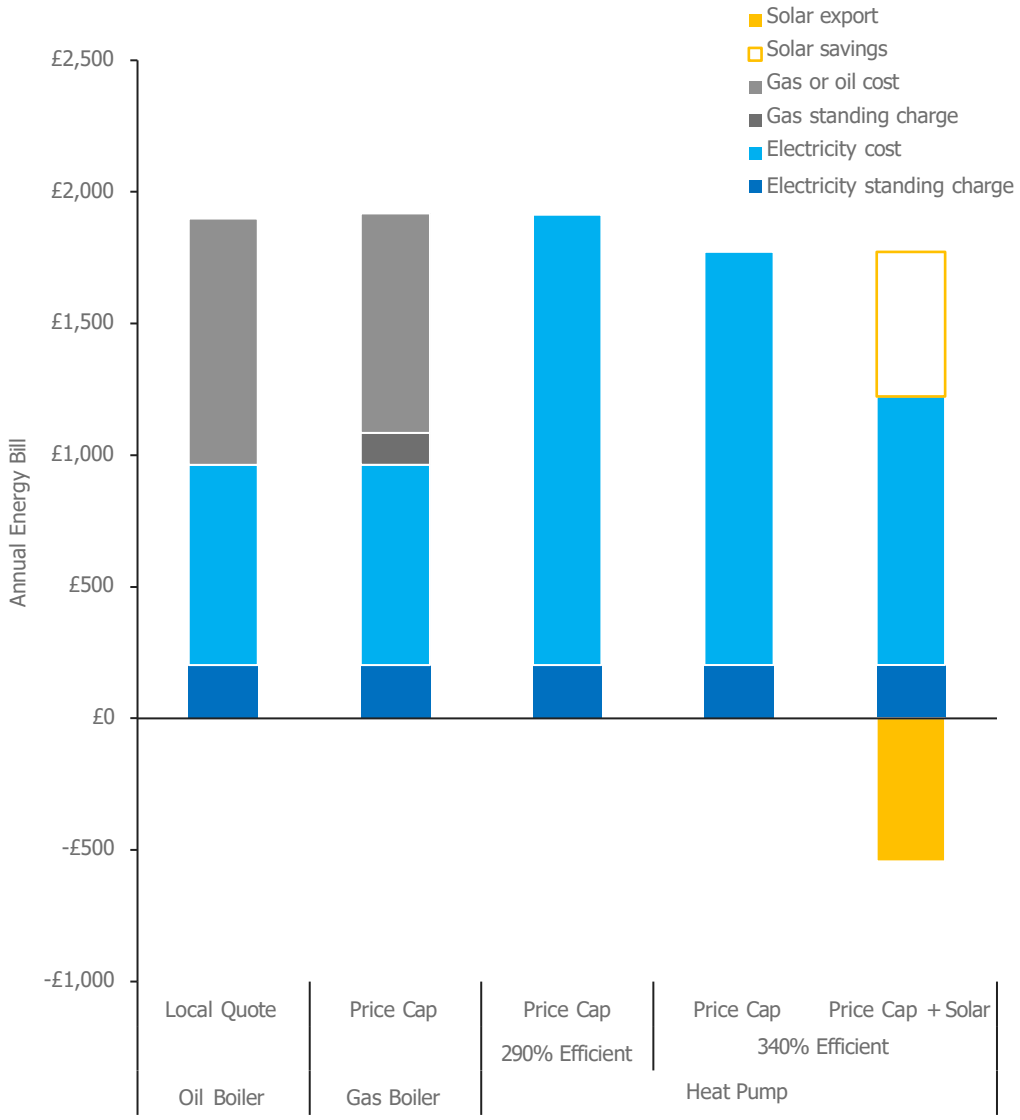
Oil prices are based on a 2024 Q1 quote for 1,100l (11,500 kWh) of heating oil including delivery costs from a local provider in Cornwall.

Gas Boiler - £1,917

Gas prices are based on the 2024 Q1 price cap prepayment rates of 7.24p/kWh and 33.32p/day for the standing charge, resulting in annual heating costs that are similar to an oil boiler.

Heat Pump

Three heat pump scenarios are considered. The first assumes a seasonal efficiency of 290%, the median achieved in the Electrification of Heat field trials, resulting in an annual cost of £1,913. The second scenario assumes an improved heat pump efficiency of 340%, a value achieved by skilled installers such as Good Energy and Heat Geek, reducing costs to £1,773, or about 8% less than a gas boiler. The third scenario assumes a 5.1kW PV array is installed so the property achieves a net zero annual energy balance. With an export tariff of 15p/kWh based on 2024 Q1 Smart Export Guarantee tariff comparison tables, and assuming 35% self-consumption based on MCS guidance for a home occupied during the day. This results in energy costs of just £680, a 65% reduction compared to gas.



There is a clear pathway to affordable electrification for customers on prepayment meters by combining efficient heat pumps with on-site solar generation.

Appendix 4

Supply chain (enabling decarbonisation)

Measures required to facilitate the decarbonisation of housing in Cornwall.

How many heat pump installers are required?

Scale of the challenge

Cornwall currently has around 187,000 fossil fuel heating systems using gas, oil or LPG. Assuming a 15 year lifetime, around 12,500 of these systems will eventually need to be replaced each year. The installation and repair of these heating systems is currently thought to be performed by around 1,000 heating engineers, based on gas safe register records for Cornwall.

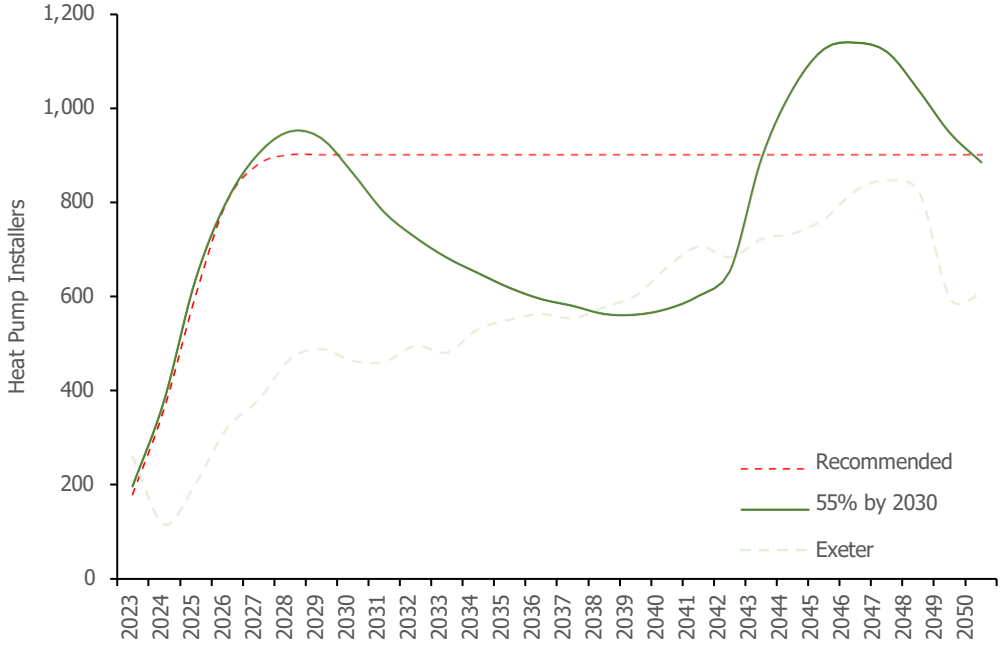
While the number of heat pump installers is unknown, there are just 35 companies recorded on the MCS database that provide heat pump installations, and around a dozen companies that provide air conditioning, who can be expected to install air-air heat pumps.

Etude have carried out analysis on a range of different heat pump deployment scenarios to understand how many installers are required to meet various targets. Assuming most new build housing will use heat pumps, around 170 installers will be required for these throughout the 2020's, falling to 120 by the 2030's, if new build rates reduce as expected. As fossil fuel heating systems in existing buildings reach the end of their useful lives, naturally replacing these with heat pumps will require another 500 or so installers.

This suggests that in any scenario, it will be important to promptly establish a baseline of around 600-700 installers, simply to meet demand in new builds and prevent replacement of fossil fuel heating systems as existing ones fail. Scenarios that result in more significant decarbonisation of existing fossil fuel heating by 2030, for example replacing between 40-60% of systems, require only slightly higher numbers of heat pump installers, between 800 and 1000.

In any scenario, it is important that the number of heat pump installers increases quickly over the next three years. Assuming there are between 100-200 installers at present when air-air, air-water and ground-water heat pumps are combined, this suggests a reasonable target would be for 50 installers to be trained (or retrained from gas/oil) every quarter until sufficient numbers are reached.

Number of heat pump installers that should be trained each quarter from now until the start of 2028



Numbers of heat pump installers required to replace 55% of fossil fuel heating systems by 2030, compared to number required to deliver heat pump installations in line with the University of Exeter's report on reducing greenhouse gas emissions from housing in Cornwall. Figures include existing homes, new homes, and replacement heat pumps. The bumps in the 2040's are caused by replacements of the initial tranche of heat pumps installed in the 2020's.

Heat pump installer training

Heating engineers promote technologies they understand

Heating engineers are advocates for the technologies they have been trained to install and are familiar with. When a heating system fails, often the first contact a homeowner has is with a heating engineer. Heating engineers are unlikely to recommend fitting a heat pump unless they have been trained to install them.

Heat pump performance is linked to training

The efficiency of heat pumps is significantly more sensitive to system design, installation, commissioning and operation than gas, oil or direct electric heating systems.

Good systems can operate reliably for many years providing low carbon heat for lower costs than fossil fuel or direct electric heating systems. Conversely, poorly installed heat pumps may not adequately heat a dwelling and be expensive to run. As heat pumps are currently regarded by many in the UK as a relatively 'new' technology, avoiding poor quality installations that result in ineffective performance that could dissuade others from adopting heat pumps is particularly important.

Whether or not a system performs well is largely dependent on the knowledge and skill of the heat pump installer. This means adequate installer training is particularly important to delivering affordable electrification of heating and positive user experiences that contribute toward further uptake of the technology. A key objective of the decarbonisation strategy is therefore to create a pool of talented heat pump installers.

Training must be affordable

Training or retraining can be prohibitively expensive for many heating engineers. They may have to take time off from paid work to attend courses, and will also have to pay for course fees, travel, and accommodation if local training is not available. Potential direct funding of some of these costs by the Council should be considered as a key strategic investment in accelerating decarbonisation.

The Energy Saving Trust and several heat pump manufacturers have created mobile heat pump training centres, which can provide BPEC or manufacturer training courses. Providing local training in Cornwall can help to overcome barriers to training that may otherwise arise due to the time and cost of travelling to training centres further away (image source: Energy Saving Trust)

Heat pump installer training

Training programme objectives

A heat pump training programme for Cornwall should be developed to deliver the following outcomes:

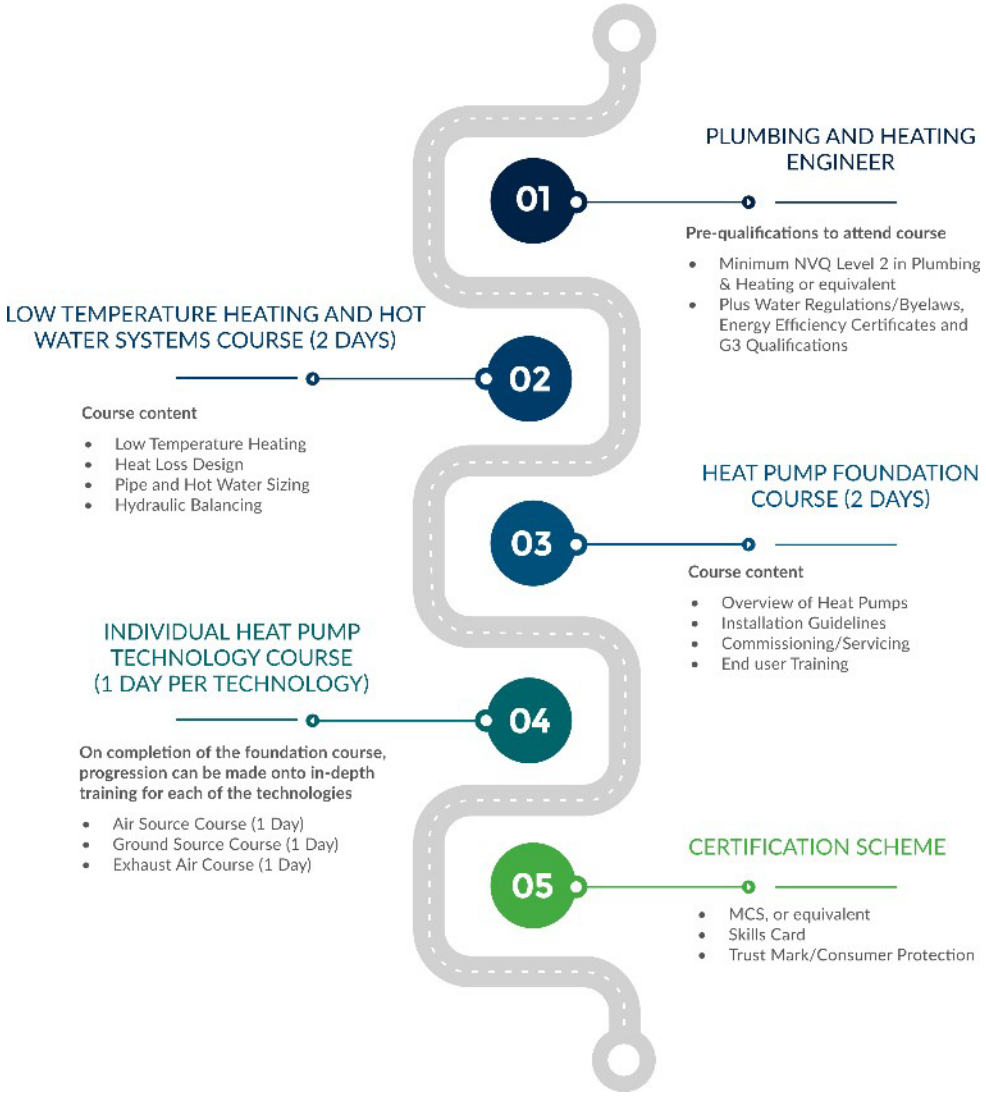
1. Consistently high standards that result in installers who can design, install and commission highly efficient heat pump systems.
2. Sufficient capacity to train the number of heating engineers required to remain within carbon budgets. In practice, this is likely to mean training around 50 engineers each quarter over the next 4 years.
3. Affordability for heating engineers, in terms of training costs, travel and accommodation costs during training, and potentially unpaid time required off work.

Training pathways

The Heat Pump Association has recently reformed the installer training pathway for wet heat pump installations in the UK, shown to the right. Following this can result in MCS accreditation. Existing gas engineers are likely to have already completed the first and possibly second levels, however these levels must be completed by new entrants. The third and fourth levels focus specifically on heat pumps and individual heat pump technologies.

This pathway alone may not be sufficient to deliver installers with sufficient expertise to consistently install high efficiency heat pumps. Additional training such as the courses offered by Heat Geek and other independent specialists are also likely to be required.

Heat pump manufacturers often offer free training for their products, however this is unlikely to be available in Cornwall, aside from ground-source training from Kensa. Some manufacturers have mobile training centres so local training could be arranged if Cornwall Council could provide a location and co-ordinate attendance by local heating engineers.



The Heat Pump Association's pathway to becoming a heat pump installer requires an NVQ level 2 in plumbing and heating, a G3 certificate, and a water regulations certificate. Trainees then study low temperature heating and hot water systems, followed by a heat pump foundation course, and additional training on individual heat pump technologies. A different pathway is required for air-air heat pumps (image source: Heat Pump Association)

Appendix 5

Raising awareness

Public attitudes to the decarbonisation of housing.

Understanding who people trust for advice on heating

The importance of trusted sources

Replacing a heating system represents both a major up-front cost and many years of operating and maintenance costs. Given the potential risks of making a poor decision, many people may be expected to stick with a technology they are familiar with such as a fossil fuelled boiler, rather than adopting less known technologies such as heat pumps. Changing people's mindsets to consider less familiar technologies like heat pumps requires information and reassurance from one or more trusted sources, to increase confidence that a good decision is being made.

Tradespeople are the most trusted source, however many will be unfamiliar with heat pumps and boiler installers may see heat pumps as a threat. Only highly trained tradespeople may be able to avoid common myths, or understand the nuances required for efficient and reliable system operation, hence the importance of high quality installer training.

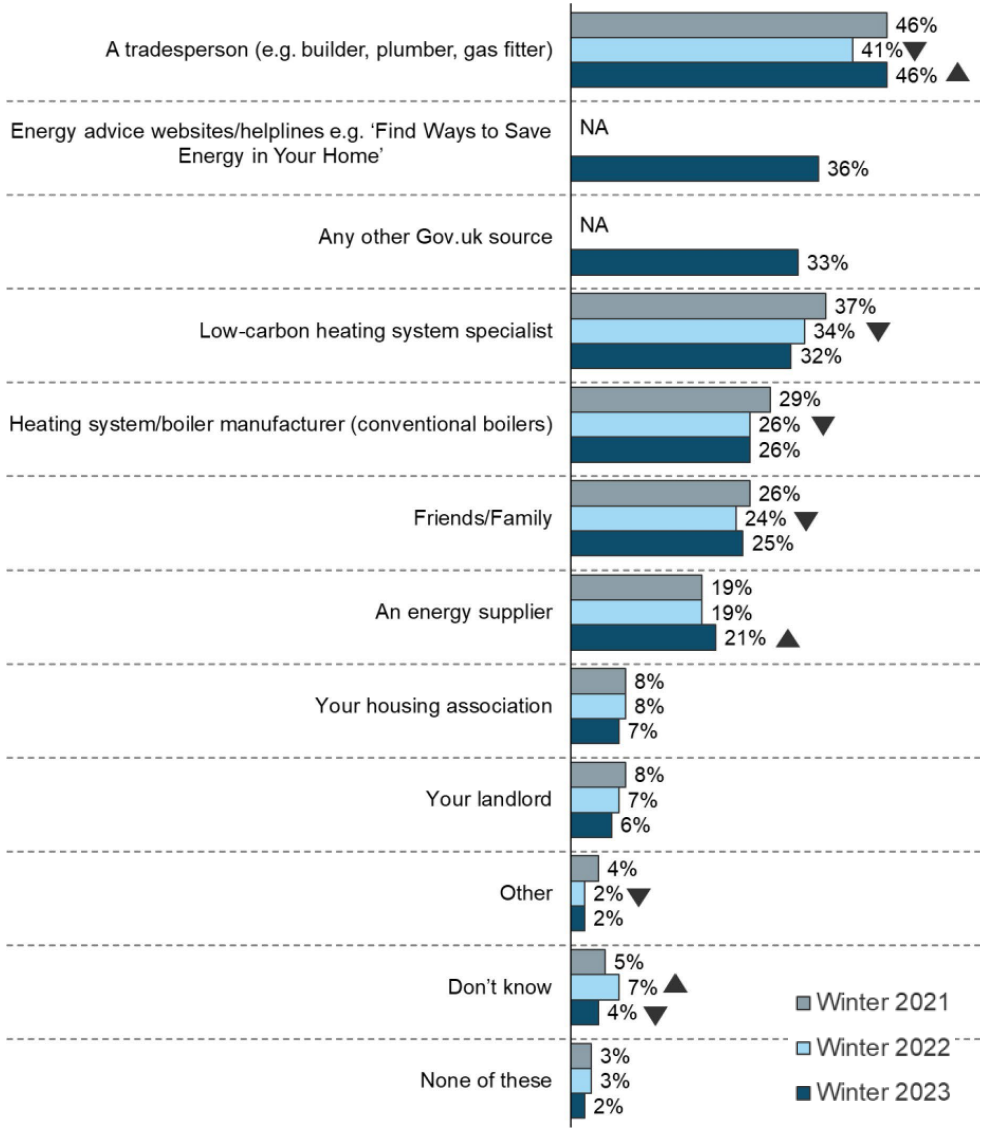
Energy Advice Services such as Community Energy Plus, the Energy Saving Trust, The Heating Hub, The Renewable Energy Hub and others provide a range of advice. Some is excellent, however others may perpetuate myths, lack clarity around the importance of low carbon heat, or the steps required to successfully decarbonise a home.

Government Sources rate highly for trust, which indicates a good opportunity for Cornwall Council to provide clear independent advice on how to affordably decarbonise their home.

Low carbon heating specialists are also highly trusted, which again indicates the importance of installer training.

Manufacturers are fairly well trusted, however this could be a problem as there are documented cases of boiler manufacturers providing dishonest advice about heat pumps.

Friends and family are also fairly well trusted, which shows the importance of ensuring consistently high standards for heat pump installations to ensure they operate efficiently and reliably with low running costs. It is vital that instances of poorly installed or maintained systems are satisfactorily resolved to build trust in the community.



DESNZ's Public Attitudes Tracker responses to the question "Which of the following would you trust to provide advice about which heating system to install in your home?" (image source: DESNZ)

Appendix 6

Road map

The next steps that could be taken by Cornwall Council and by private organisations and individuals

Next steps

Turning a housing decarbonisation strategy into real projects at scale requires many parties to engage with the process and to develop implementation plans that can deliver action and progress. The council cannot directly action or fund all of the work needed.

The 'road map' set out in the next pages provides a series of 12 key steps that the council can take themselves to directly decarbonise homes, or to support, enable and encourage various other groups to take the strategy forward.

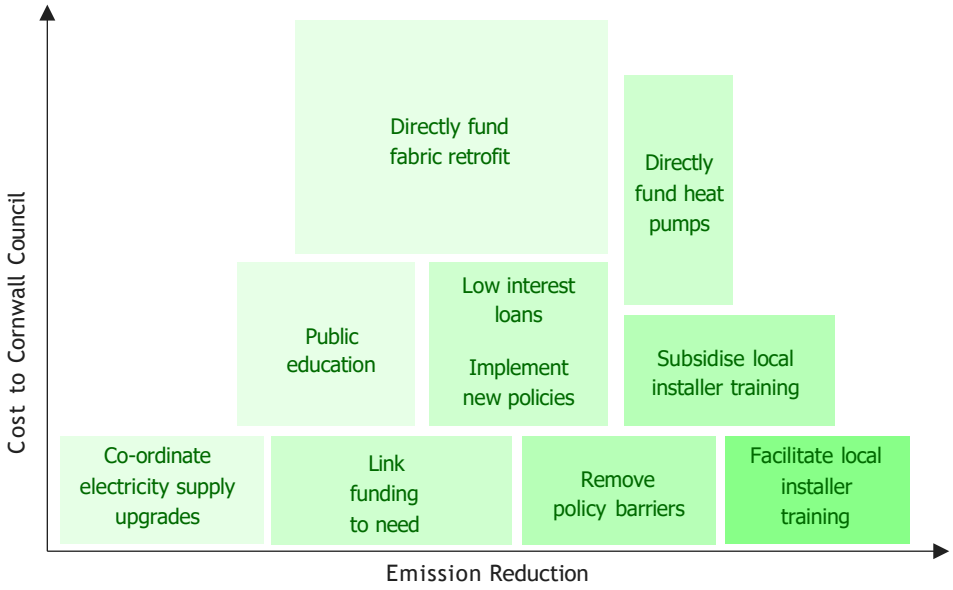
While it is important to decarbonise housing at a rapid pace to remain within a 1.5°C carbon budget, the process should use feedback to refine and streamline the approach, and share knowledge as delivery accelerates. The initial tranche of projects can provide opportunities to demonstrate decarbonisation approaches to others.

Community energy groups

Community groups are already doing some excellent work and can play a significant part in implementing the strategy. A place-based approach will enable work to respond to the local conditions and demographic more closely than a county-wide plan. Local communities may engage with particular suppliers and installers as a group to share set up and other costs.

Cost-benefit of council actions

Some actions the council could choose to take to implement the decarbonisation strategy cost very little, while others may be prohibitively expensive. As the impact of some actions is not directly related to the cost of the action, this provides an opportunity for some low-cost, high-impact actions that appear to be low-regrets immediate actions. Examples include facilitating installer training, removing policy barriers, linking funding to eligible recipients, and working with the DSO to upgrade electricity supplies.



The council can intervene in different ways to decarbonise the housing stock. This image provides indicative costs for difference council actions versus emission reductions to make the point that several council actions could have quite high impact for relatively low cost. Ultimately, many of these actions are likely to be necessary, but the order and scale with which they are implemented could be optimised based on the relative cost and impact.

Remove policy barriers

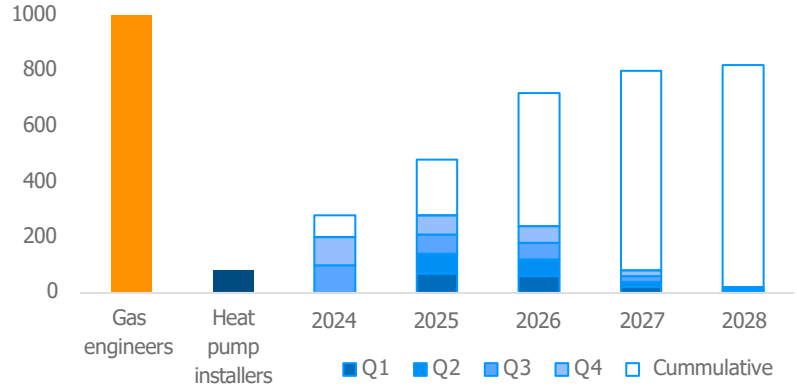
A review of policies which link to decarbonisation is a cost-effective action the council can take to enable acceleration. Planning policy is discussed later in detail, but there are other policies which could be considered. For example, the statutory Housing Renewals which links housing assistance with those greatest in need could help to mitigate the financial barriers to decarbonisation. The Council has already committed to a review of this policy to highlight the interdependencies.

1. Facilitate training for heat pump installers

Rapidly increasing the numbers of trained heat pump installers in Cornwall is a key strategic action required to accelerate the decarbonisation of homes. As well as increasing installer numbers, an emphasis on training quality is also required to raise the baseline level of installer competence to a more consistent level of good practice, ensuring the majority of systems are efficient, affordable, and reliable.

There are various ways the council could support heat pump training programmes. Understanding the views of existing refrigeration engineers, heat pump installers, and boiler engineers will be an important early step to designing training interventions. Co-ordinating with existing training providers and industry bodies such as the Heat Pump Federation, Heat Pump Association, and MCS could help to ensure the industry's latest approaches to training are applied in Cornwall.

Travelling out of Cornwall to access training is expected to be a significant barrier for local tradespeople, many of whom are self-employed and therefore self-funded, so arranging local training courses, where possible, is expected to be a particularly effective intervention.



Required numbers of heat pump installers that need to be trained from 2024-2028. Beyond 2028, an annual training capacity of 20-30 is expected to be sufficient. Approximate number of heat pump engineers and registered Gas Safe engineers in 2023 shown for comparison.

2. Public education campaign on heat pumps, fabric retrofit, and solar photovoltaics

Increasing levels of public awareness around the need for heat decarbonisation, the key role of heat pumps, and steps required to install one, are expected to be high impact measures given current lack of awareness and knowledge in this area. Knowledge of fabric efficiency and solar photovoltaics is better, but surveys indicate large numbers of people who could be nudged into action. Potential ways the Council could inform the public, specifically about heat pumps and heat pump readiness include:

1. Connecting with heating engineers

The council could work with heating engineers across the county to understand their plans for attending heat pump training, ensure they are aware of Cornwall's new build policy (which effectively requires heat pumps in most cases), and goals for heat pump deployment in existing housing.

2. Council website

The council could provide impartial guidance and link to trusted sources of information. For example, the importance of heat pumps in meeting Cornwall's carbon neutral goal could be promoted on the Council's website, and a variety of resources could be provided on how to get a heat pump, apply for grants, and ensure homes are heat pump ready.

3. Schools and colleges

Helping schools to engage with heat pumps disseminates information through children to their parents. Colleges will play a key role in the supply chain by offering training in county.

4. Open days

Opportunities for people to see working heat pumps and talk to homeowners can be invaluable in building understanding.

5. One stop shops

Emerging one stop shop models are aimed at removing a lot of the barriers to heat pumps and bringing together compelling financial products. Some one stop shops for fabric retrofit provide design support and retrofit co-ordination, such as 'Cosy Homes Oxfordshire'.

3. A plan for Council owned homes…

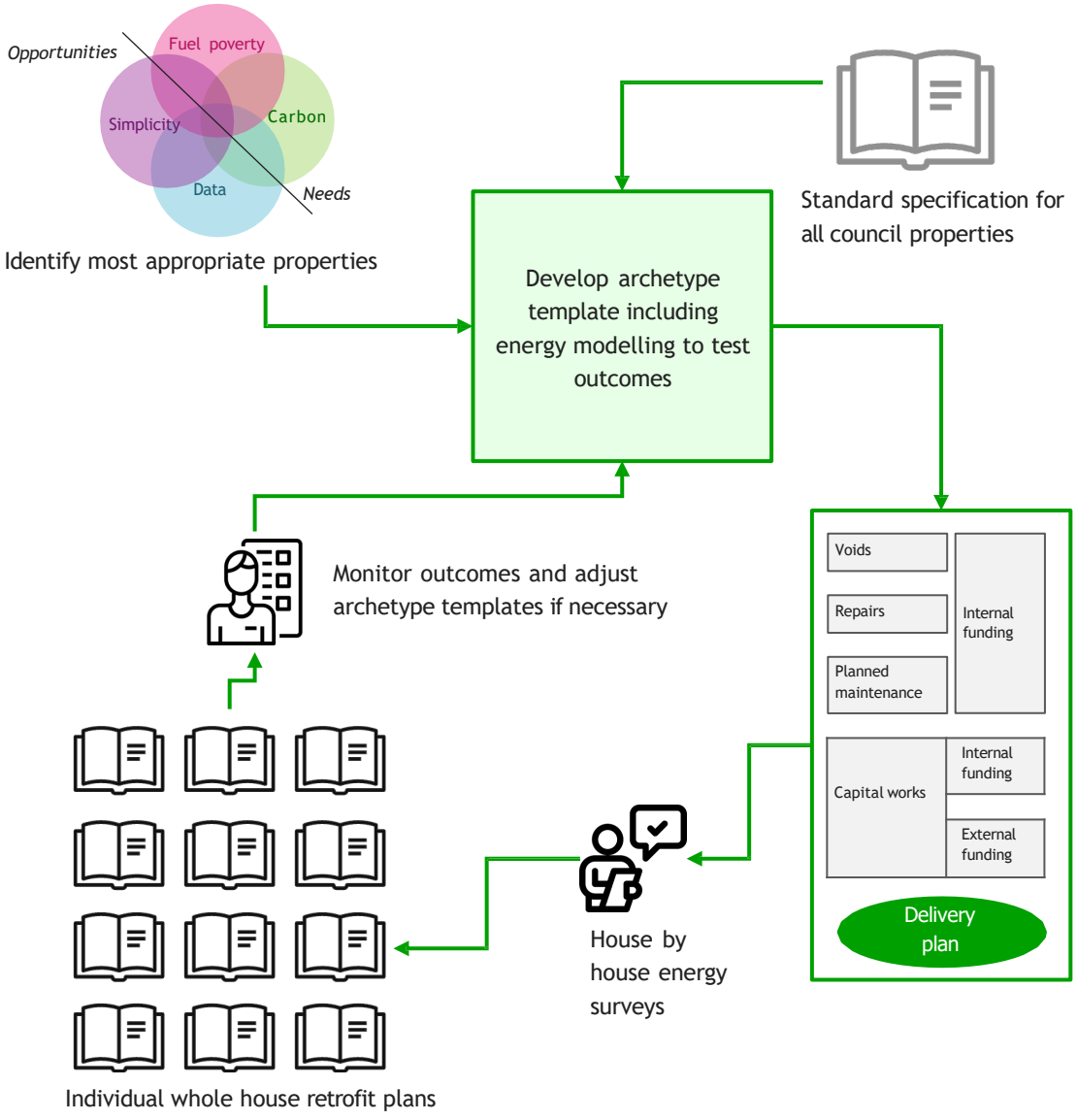
As a first step, the installation of new and replacement fossil fuel heating systems in council owned homes should end as soon as possible to avoid locking in emissions and adding to the existing pool of dwellings that need to be decarbonised. A programme of actively decarbonising the existing heating systems in council properties is also essential and provides an important way to kick-start the heat pump industry in Cornwall over the next few years. This work should be combined with basic building fabric upgrades.

Design a process

A stock level retrofit process based on this decarbonisation strategy needs to be developed, which will be particular to the tenure, ownership, situation and condition of each group of homes.

- The first step should be to assess the heat pump readiness of the housing stock and schedule any required upgrades with National Grid Energy Distribution.
- For social rented homes, the next step would be an assessment of need and deliverability.
- A standard specification for individual measures, prioritising heat decarbonisation, would help to simplify procurement.
- Identify key archetypes and then apply the standard specification to create a template set of measures.
- Carry out detailed surveys, preferably including sample air pressure tests and thermography as well as general energy surveys (as set out by PAS2035) for all the homes in the batch, to develop longer term retrofit plans for every building.
- Consider the planned maintenance for the homes – e.g. if boilers are due for replacement. If there are voids in the near term, these can be used to develop the specification and show functional examples of decarbonised homes to residents to get their buy in.
- Monitor outcomes and publicise the method and results to other social tenants and to RSLs who could follow a similar approach.

4. Setting long term targets for decarbonisation..



The steps to create a process for taking the decarbonisation strategy and making an delivery plan for Council owned homes.

5. Work with all tenure groups

Create a Retrofit social housing working group

There are some activities which represent collaboration opportunities between Cornwall and registered providers. They include:

- Technical collaboration on simplifying the retrofit challenge by comparing council and registered providers' social housing stock, identifying common archetypes and sharing whole house retrofit plan templates.
- Procurement collaboration, building on some existing shared procurement models and aggregating demand for the social housing stock.
- Cost and finance collaboration, sharing cost estimate, ideas for cost optimisation and analysis of suitable emerging finance products, including investment from institutional investors.
- Communication collaboration, enabling the development of better engagement tools and material around the benefit and necessity of retrofit.

Showcase council projects for homeowners and landlords

Sharing outcomes and experience from early council retrofit projects can start collaboration and make connections.

Many homeowners have never seen a heat pump or an MVHR unit, so opportunities to see (and hear) them may help to allay concerns about the impacts they might have.

Events which introduce community groups and provide opportunities to meet residents who have been living in decarbonised homes and can relate real experiences can achieve much more to build confidence than salespeople from installers.

Private landlords will want to know real costs, where to find reliable installers and which technologies have been adopted elsewhere.

Facilitate discussions about funding for each tenure type

There are Government funding streams for social landlords. The council will need to access these to carry out work to council owned homes and could then support other RSLs to make applications themselves. Explaining the process, prerequisites and success criteria can help to make the applications less daunting, especially for the smaller co-ops and local providers. The Social Housing Decarbonisation Fund (SHDF) encourages bids from multiple providers – the Council could help to introduce similar groups to one another who may wish to collaborate to bid.

For private landlords there are currently no grant schemes. Leveraging mortgages and other finance to pay for the upgrades is possible but will impact rents. Ensuring this is done fairly, so that savings in energy bills defray the rent increases for tenants, will require good quality installations to realise running cost reductions and oversight to avoid unrealistic forecasts of energy savings being used to inflate rents.

For homeowners, the Boiler Upgrade Scheme can provide some funding for those eligible. Explaining how it works and who can access it will help residents to access that support. Financing deals are also available for private householders to raise capital against future savings in running costs. The council could host meetings with reputable finance companies to explain how those schemes can work.

6. Facilitate training in building fabric efficiency and ventilation

A range of organisations offer training in building fabric efficiency measures and ventilation systems. The Green Register offers courses in sustainable construction practices, and retrofit principles and practice. The Retrofit Academy provide specific courses on topics such as installation of wall insulation and retrofit of traditional buildings, as well as more general courses on how to become a retrofit designer, advisor, assessor, or coordinator, for delivery of PAS 2035. BPEC provide basic training on installation and commissioning of different ventilation systems, including heat recovery ventilation, to align with requirements of Part F of the building regulations. The UK Passivhaus Trust and AECB provide Passivhaus Tradesperson courses, which cover best practice approaches to insulation, high performance glazing, airtightness, thermal bridging, and heat recovery ventilation.

Cornwall Council could facilitate training through a range of approaches, from providing spaces for training to take place, to co-ordinating regular training sessions in the county, and identifying or providing funding.

Specialised training courses enable tradespeople to practice applying airtightness products and insulation while avoiding thermal bridging. (image source: Emu Passive)

7. Close the feedback loops on heat pumps and building fabric retrofit

Poorly installed heat pumps and fabric retrofit measures are unacceptable and create strategic risk to decarbonisation efforts by providing case studies of poor performance that can discourage others.

To resolve this, feedback loops need to be created and/or strengthened to ensure that problematic installations are dealt with quickly, and steps taken to prevent their recurrence, such that installation quality steadily improves over time.

This will require greater use of existing feedback loops, such as consistently reporting problematic installations to MCS, trade associations, other governing bodies, and public review websites. Existing feedback loops could be strengthened, for example Cornwall Council could work with MCS and trade associations to highlight where existing systems are deficient. Finally, new feedback loops may need to be created where existing ones are insufficient, for example Cornwall Council could develop an award scheme or list of installers who deliver consistently good practice.

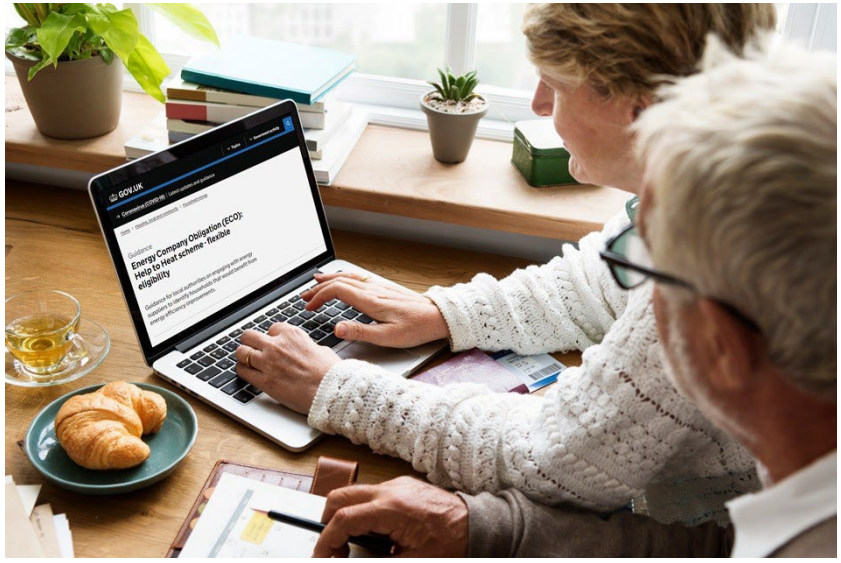
In this image, the installer appears to have lacked an understanding of a heat pump's principle of operation and has not followed basic manufacturer guidance to ensure adequate air supply. As a result the system will operate at very low efficiency, needlessly increasing operating costs (image source: Heat Pumps UK & Ireland Facebook Group)

8. Actively identify, target and connect funding with eligible homes

A variety of funding schemes are currently available, however these will change over time and may involve complex eligibility criteria. Tracking, targeting and connecting funding to eligible property owners and occupants is an effective way that Cornwall Council can help to accelerate the decarbonisation of homes in the county.

The Council could maintain a database of current and upcoming funding, and work directly with Cornwall Housing and RSL's to ensure they are aware of them. To reach private landlords and homeowners, the Council's communications team could integrate summaries of funding into public education materials aimed at these groups.

Excessive reliance on funding should be avoided to reduce risk of industry dependence that could lead to vulnerability if they are withdrawn. Encouraging use of non or less-subsidised technologies such as air-air heat pumps could be one way to achieve this.



Many people may not be aware of funding, or whether they are eligible to receive it. Increasing awareness and connecting eligible households to funding sources could be an effective role for the Council. (Image source: ukenergysupport.co.uk)

9. Work with National Grid Energy Distribution to align investment plans and system upgrades

Cornwall Council can work with National Grid Energy Distribution (NGED) in two key areas. The first is to share strategic planning around housing decarbonisation and rates of heat pump deployment to inform the development of NGED's next business plan that will be submitted to OFGEM to secure investment required for the RIIO-ED3 price control period starting in 2029.

The second is to work with NGED on a day-to-day basis to assist in coordinating efficient and timely upgrades to the electricity distribution system. For example, if Cornwall Housing owns the majority of homes in a street or neighbourhood, and is planning to install heat pumps and solar photovoltaic systems that require unlooping of supplies and service capacity upgrades to 80A, it may be less expensive and less disruptive for these and any other required distribution system upgrades to be carried out to the whole area, rather than one home at a time.

Unlooping a domestic electric supply is often expensive and disruptive. Co-ordinating with the Distribution System Operator can provide opportunities to unloop multiple supplies at the same time to minimise cost and disruption. (Image source: speakev.com)

10. Implement frictionless planning policy

Planning Policy to Support Decarbonisation

The planning policy requirements for energy efficiency in new construction have improved over time. However, the same has not happened for works to existing buildings requiring planning consent. This particularly includes local guidance such as Conservation Area Management Plans provided by Parish Councils, which may not have been updated in over a decade and in some cases actively discourage the installation of key low carbon technologies.

Environmental and heritage conservation hand in hand

Low carbon retrofit of heritage and traditional construction buildings is possible. Well-planned retrofit programmes can contribute to conservation by incorporating maintenance and repair and offer a new lease of life to buildings. They limit the risk of under-heating, with the associated risks of fabric degradation.

Provide a simple application process for key interventions

Some interventions for retrofit require a change to the external fabric of the building. Where this is known and is not covered by the planning system, the council can seek to create standardised and simplified processes for applications.

Giving planning officers confidence and support

Cornwall Council could develop internal guidance and knowledge transfer mechanisms on retrofit, including:

- Supporting a network of housing delivery, energy and conservation planning officers, to share concerns, solutions, common questions. The network should have access to advice from the energy efficiency and heritage experts.
- Disseminating existing guidance and case studies.
- Training and events tailored to planning officers, on the topic of energy efficiency and low carbon solutions.
- Bringing in external advice for example on design review panels.

11. Work with national heat pump installers

Heat pump installations are increasing nationally.

There are several national organisations who are offering heat pump installations that are less than the cost of replacement oil or gas boilers (including the BUS grant), but many of these are not operating within Cornwall. The council could contact them to understand why and to put in place the facilities or measures needed to make sure the county's residents are not disadvantaged compared to the rest of the country.

The Government's Heat Pump Ready funding programme has supported projects across the UK, including some nationwide schemes in Stream 2. The southwest region is not generally represented in these schemes. It may be possible to engage with local suppliers and bodies to bring future projects to Cornwall.

12. Identify areas for heat networks

District heat networks can be used to provide low carbon heating to new and existing homes if a suitable centralised low carbon heat source is present. As there are inherent advantages and disadvantages to distributing heat at different scales, a balanced approach to heat networks is proposed, where potential heat networks are assessed on their individual merits, rather than adopting a blanket assumption that networked heat is preferable to decentralised/individual systems.

Two types of heat network are expected to be appropriate in communities with compact town or village centres, communal ground loop heat pump systems, and deep geothermal networks.

The first type uses ground source heat pumps, that share a communal ground loop using a network of pipes connected to boreholes with water that is close to ambient temperatures, so heat losses from the pipework are limited. Each home has a small heat pump connected to the ground loop which can provide efficient weather compensated space heating and hot water from a carefully optimised heating profile.

Cornwall also has a unique geothermal potential, which may be able to provide low carbon heating to some communities. Langarth Garden Village district heat network is a flagship project – the first zero carbon deep geothermal heat network in UK. The outcomes from that project may enable more schemes to come forward – a further 10 have been identified.

Other heat sources and particularly higher temperature networks may experience relatively high heat and pumping energy losses, which can make them inefficient, while also preventing use of cheaper dynamic electricity tariffs and on-site solar generation for heating. These types of network need to be carefully assessed and compared against a decentralised heat pump. The rural, relatively low density of much of the housing in Cornwall is not generally well suited to traditional heat networks used in large urban centres.

Our vision

- Green house gas emissions from our homes do not negatively impact the environment
- Homes are well insulated and have low carbon heating systems supported by renewable technology
- Homes are affordable to heat, and no one has to choose between heating and eating
- Our homes promote a healthy lifestyle and enable us to thrive
- There is a solution for all, and no one gets left behind

If you have any questions or comments email:
HousingDecarbonisation@cornwall.gov.uk

www.cornwall.gov.uk

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Etude

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Making homes in Cornwall better for the environment

Cornwall Housing Decarbonisation Strategy

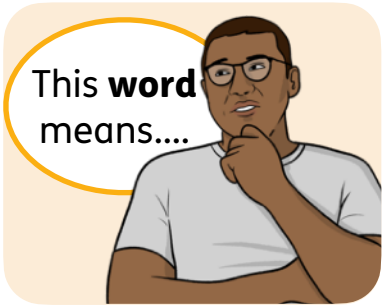
Easy Read

Easy Read

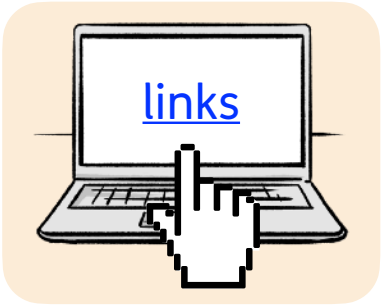
This is an Easy Read version of some information. It may not include all of the information but it will tell you about the important parts.

This Easy Read booklet uses easier words and pictures. Some people may still want help to read it.

Some words are in **bold** - this means the writing is thicker and darker. These are important words in the booklet.



Sometimes if a bold word is hard to understand, we will explain what it means.



Blue and underlined words show links to websites and email addresses. You can click on these links on a computer.

What is in this booklet

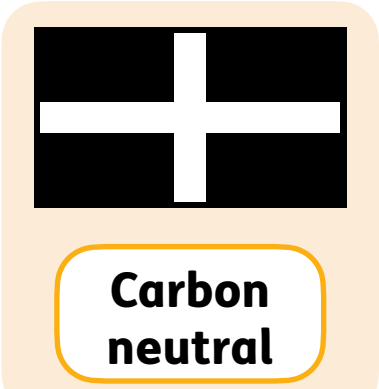
About this booklet

Cornwall Council have written a **strategy** about how we need to change homes in Cornwall.

A **strategy** is a plan of things to do over a period of time.

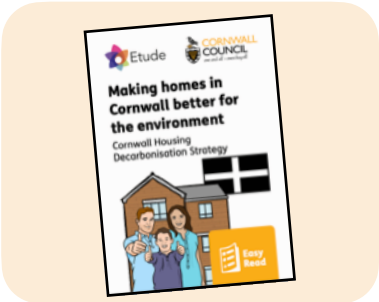
Our strategy will help homes make less **carbon dioxide**. This is called **housing decarbonisation**.

Carbon dioxide is a gas that is bad for the air.



The strategy is part of our plan to make Cornwall a **carbon neutral** county.

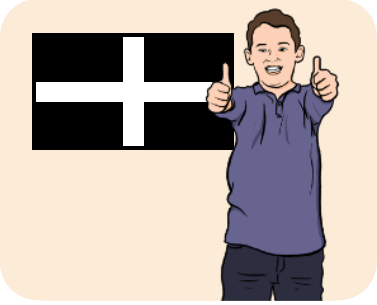
Carbon neutral means lowering the amount of carbon dioxide that goes into the air.



This booklet will tell you about the strategy.

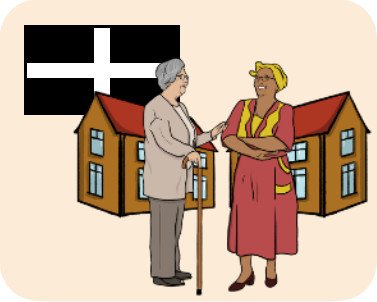
What we want to do

We want to create a carbon neutral Cornwall, where everyone can:



- **Start well.** This means we want Cornwall to be a brilliant place for a child to grow up.

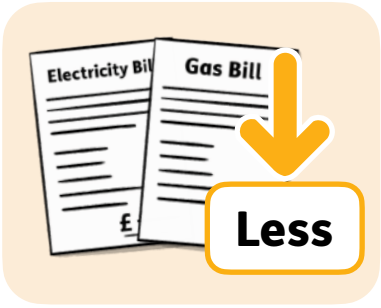
- **Live well**. This means we want Cornwall to be a place that offers a home, a good wage and a great place to live for everyone.



- **Age well.** This means we want Cornwall to be a caring and safe place where people help each other.

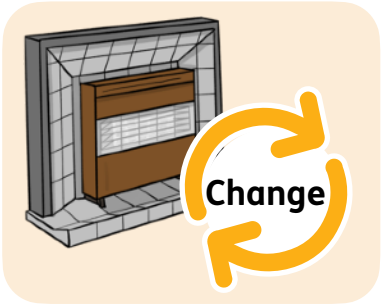
Homes make about one fifth of the carbon dioxide made in the whole of Cornwall.

We want to:



- Help people spend less on energy bills, like gas and electricity.

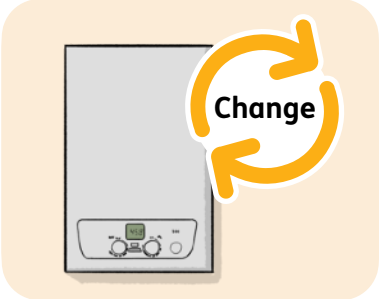
- Make the homes in Cornwall more healthy places to live.



To do this, we need to change how people heat their homes.

What we already know

All countries in the world need to make less carbon dioxide.

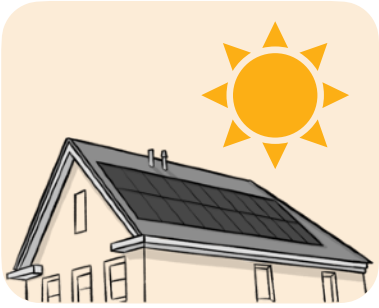


The best way to make less carbon dioxide is to change how we heat homes.

There are 3 ways to do this:

1. Stop using **fossil fuels** to heat homes.

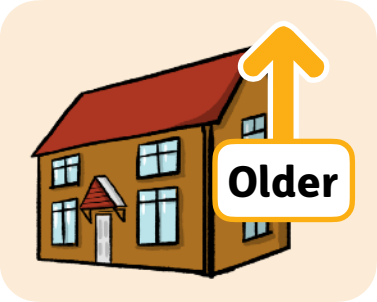
   Fossil fuels are oil and gas from the earth or the sea. Burning them for heating is bad for the earth.



2. Put **solar panels** on homes.

   Solar panels use the sun to make electricity.

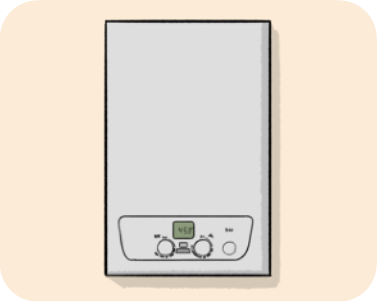
3. Keep more heat inside homes.



We know that:

- A lot of homes in Cornwall are older than in the rest of the country.

- In the future, new homes in Cornwall will not make much carbon dioxide.

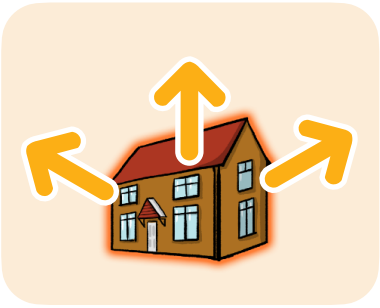


- Nearly half of the homes in Cornwall are heated by gas.

- More roofs in Cornwall need **insulation** than in the rest of the country.

  Insulation is material that stops warm air from getting out of buildings.

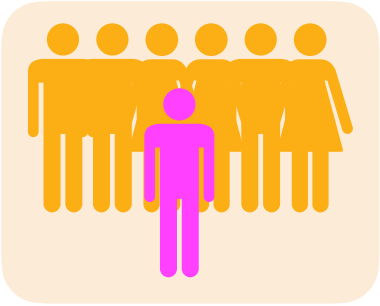
We also know that:



- The glass in a lot of homes in Cornwall does not keep warm air in very well.

- It will cost more than £2 billion to move all homes to heating that costs less.

- It will cost more than £8 billion to give all homes good insulation.



- About 1 in 7 people in Cornwall cannot afford to heat their homes properly.

Our principles

We have 4 **principles**.

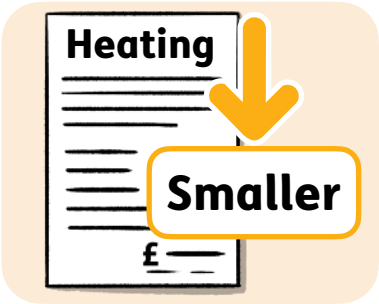
Principles are ways of doing things.

1. Stop using fossil fuels

We want to stop using fossil fuels for heating in more than half of the homes in Cornwall by 2030.

2. Reduce fuel poverty

Fuel poverty is when people do not have enough money to heat their homes properly.



We want to make their heating bills smaller.

3. Improve health and wellbeing

Wellbeing means feeling happy and healthy in your body and mind.

Homes should be more comfortable to live in as we change how they are heated.

4. Bring jobs and skills to Cornwall

There will be more jobs for people to work on decarbonising homes.

We will help train people to do these jobs.

The challenges

We will only be able to make our plans happen if we can solve the main **challenges**.

Challenges are problems that we have to find answers for.

The biggest challenges are:

- Getting people to understand what they need to do to their homes.

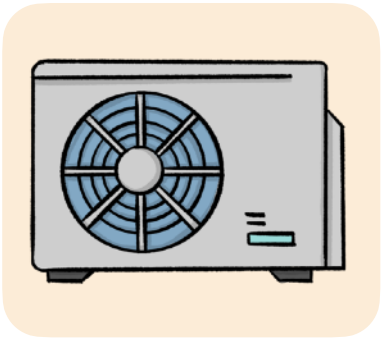
- Making sure the work on people's homes is done well.

- Finding the money to pay for the work.

- Having enough people with the skills to do the work.

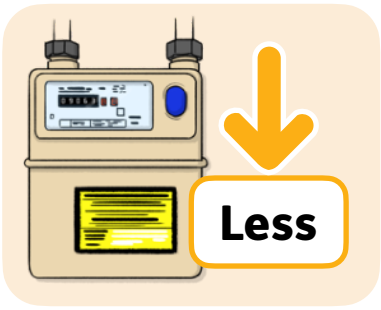
Our targets

We want to:



- Move nearly all homes to heat pump heating by 2050.

  Heat pumps take warmth from outside the home and use it for heating and hot water.

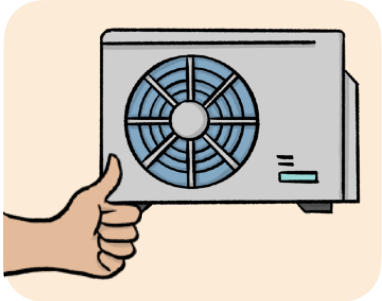


- Get all homes to use less energy.

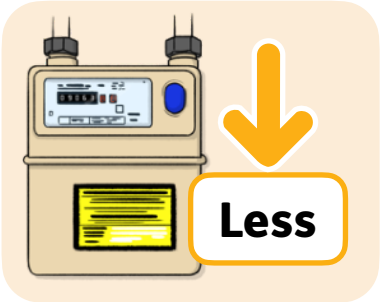
- Give homes better insulation so that it takes less energy to heat them.

- Help at least a quarter of homes in Cornwall to make electricity.

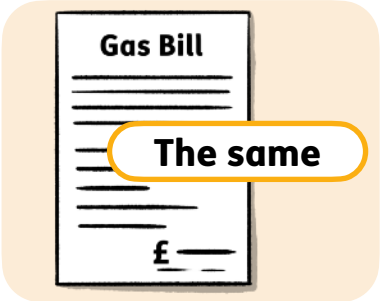
About heat pumps



Heat pumps are the best way to heat homes without making a lot of carbon dioxide gas.



They use a lot less electricity than electric heating.



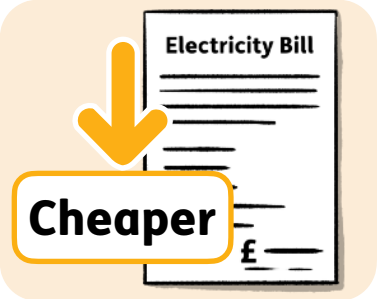
They cost the same or less to use than gas or oil heating.

How to make homes better for the environment

First we have to check the electricity supply to homes.

Then we need to make sure that the homes do not need too much energy to make them warm.

Then we can think about other ways to make bills cheaper, like:



- Helping people to use cheaper electricity.

- Installing solar panels.

We can also think about making other changes to the building, like new windows or insulation.

Each home will need different work to make them healthier.

It costs between £3,000 and £100,000 to do all the work on a home.

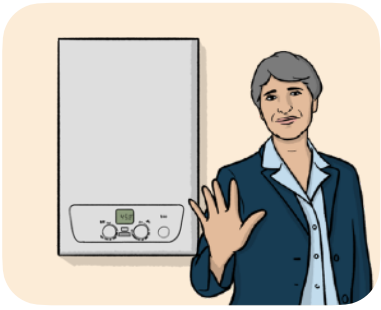
Next steps

We cannot reduce the amount of carbon dioxide that homes make on our own.

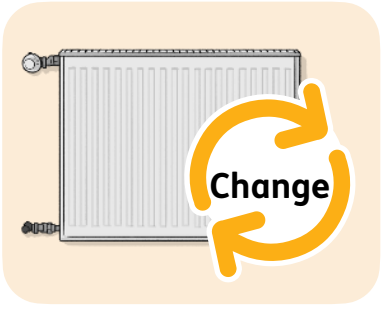
But we think there are 12 things we can do:

1. Make sure there is training for people to put heat pumps in homes.

2. Tell the public about heat pumps and other changes they can make.



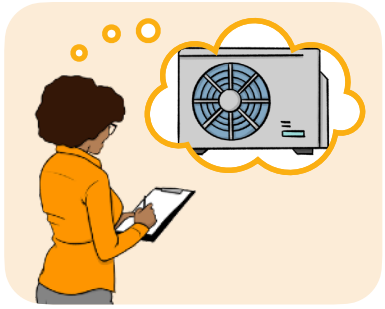
3. Stop putting new oil or gas heating in council homes.



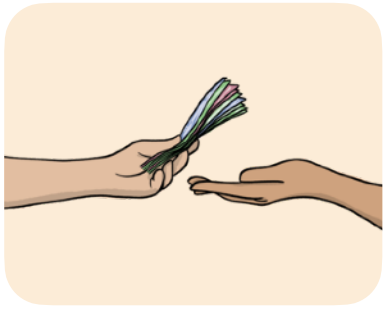
4. Change the heating in council homes so it makes less carbon dioxide.

5. Work with people who own or rent homes.

6. Make sure there is training for other jobs to help keep homes warm.



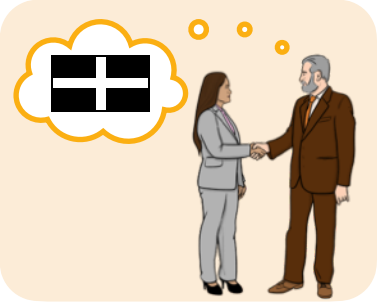
7. Find out how well heat pumps and other changes are working, and use that information to make more changes.



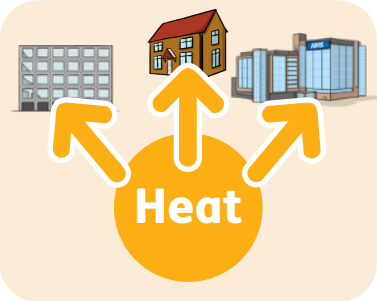
8. Help people get money to make changes to their homes.

9. Work with electricity companies to help make the changes happen.

10. Make it easier to let people do the work on homes.

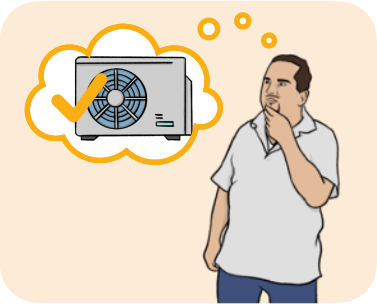


11. Work with companies who put heat pumps in homes in England to make sure Cornwall is not left out.

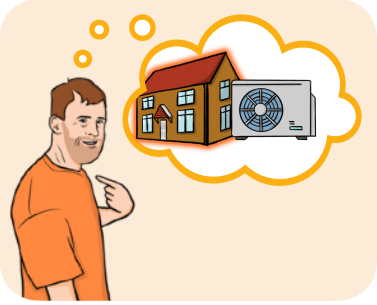


12. Find places for **heat networks**.

    Heat networks get heat from a central place and use it to heat lots of different buildings.



If we do the first 4, we think that people will know more about heat pumps and decarbonisation.

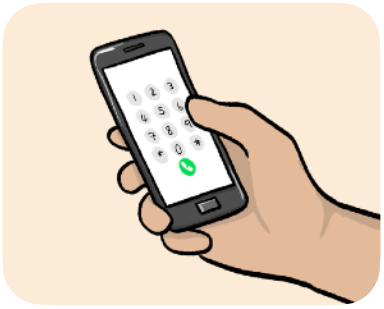


This will mean that people will choose decarbonisation for themselves.

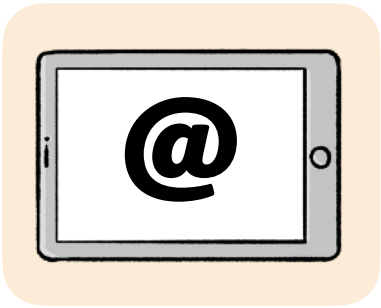
Find out more

You can look at our website here:
https://www.cornwall.gov.uk/housing/private-housing/housing-decarbonisation-programme/

You can contact us by:



- Phone: 0300 1234 151



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