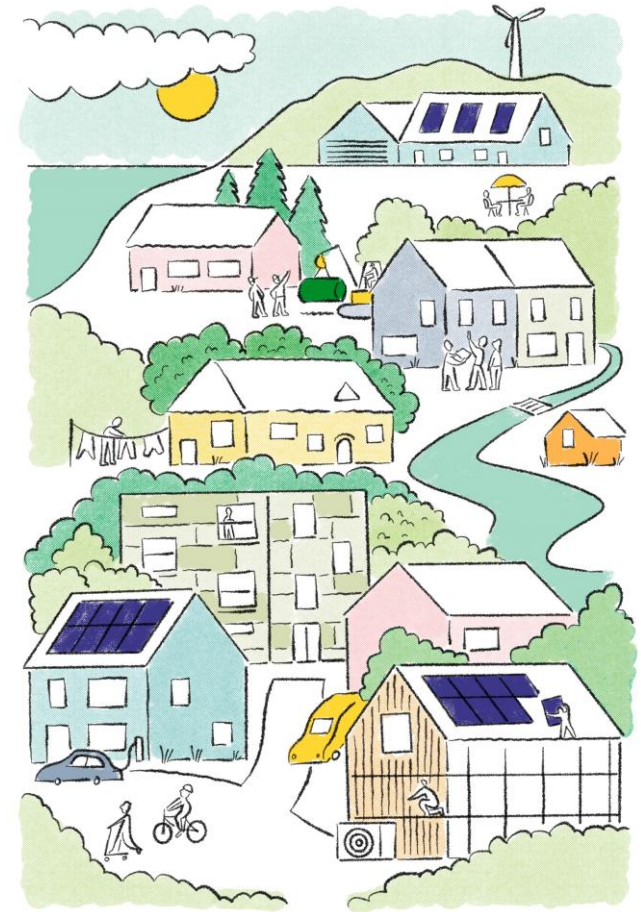


Retrofitting and Energy Efficiency in Practice

6th Feb 2025

Kate Royston, Tamar Energy Community
For Stoke Climsland Carbon Zero Homes



Introduction to TEC and community energy across SW

- Community energy organisation (CEO) operating across West Devon and SE Cornwall
- We
 - Provide retrofit and energy advice and support to the vulnerable, fuel poor and those 'able to pay'
 - Develop and own community scale renewable energy (7 solar rooftop systems generating 427 kWp)
 - Look at opportunities for innovation based on smart, local systems
 - Engage and inform
- We're part of a Devon wide network of CEOs who collaborate and cooperate under banner of Devon Community Energy Network
- With the local authorities we all collaborate through Energy Saving Devon
- Across Devon and Cornwall we're partners in a £1.4m initiative to pilot ways of supporting our communities to futureproof their homes
- DCEN members own and run a development CIC for larger scale renewables – Devon Energy Collective

Our rooftop solar



Retrofit and Energy Advice services we provide

Our team of qualified and impartial home energy and retrofit advisors provide:

- Free home visits for eligible households across West Devon (gross annual household income less than £36k, poor health or other vulnerabilities)
 - Includes support with energy suppliers, bills, reducing usage, easy measures and crisis support, checking on heating and insulation etc. and referrals into grant schemes
 - This includes referrals into West Devon HUG2 scheme and ECO4
- Events, talks and drop-ins including Tamar Energy Fest every November
- Free retrofit advice visits for eligible households (any income, primarily hard to treat properties, hard to reach households and those on a low income)
 - Focused on supporting households to better understand the next steps to improving their homes and where possible signposting next steps
- Paid for whole house plans delivered by our partners at Dartmoor Energy. A comprehensive plan of the steps needed to futureproof your home, how much this might cost, and the order of works. Subsidies available until end March 2025.
- Further, paid for, support to assist in taking forward a whole house plan into design and installation



Managing energy use in the home

- Keep an eye on your bills and understand your usage. Take control
- Manage usage in the kitchen – slow cookers, microwaves, airfryers
- Manage usage in the bathroom – watch that electric shower
- Insulation and effective heating and controls
- Ventilate well
- Go smart if you can!
- Try and avoid the peak (electricity usage between 16:00 and 20:00)

Introduction to Retrofitting

- Retrofitting – doing things to improve existing buildings to make them as energy efficient as possible (ideally net zero)
- Whole house approach – looking at your home as a whole, and as a system
 - Fabric first – helping your home retain as much of its heat as possible
 - Deal with damp – deal with any causes of damp and make sure ‘rainwear’ is suitable for heavier downpours
 - Ventilation – making sure that the air is fresh and regularly changed
 - Renewable heat and hot water system(s) with the right controls
- Aim – warm, healthy home which costs less to heat and as close to net zero as possible

A great video to explain retrofitting

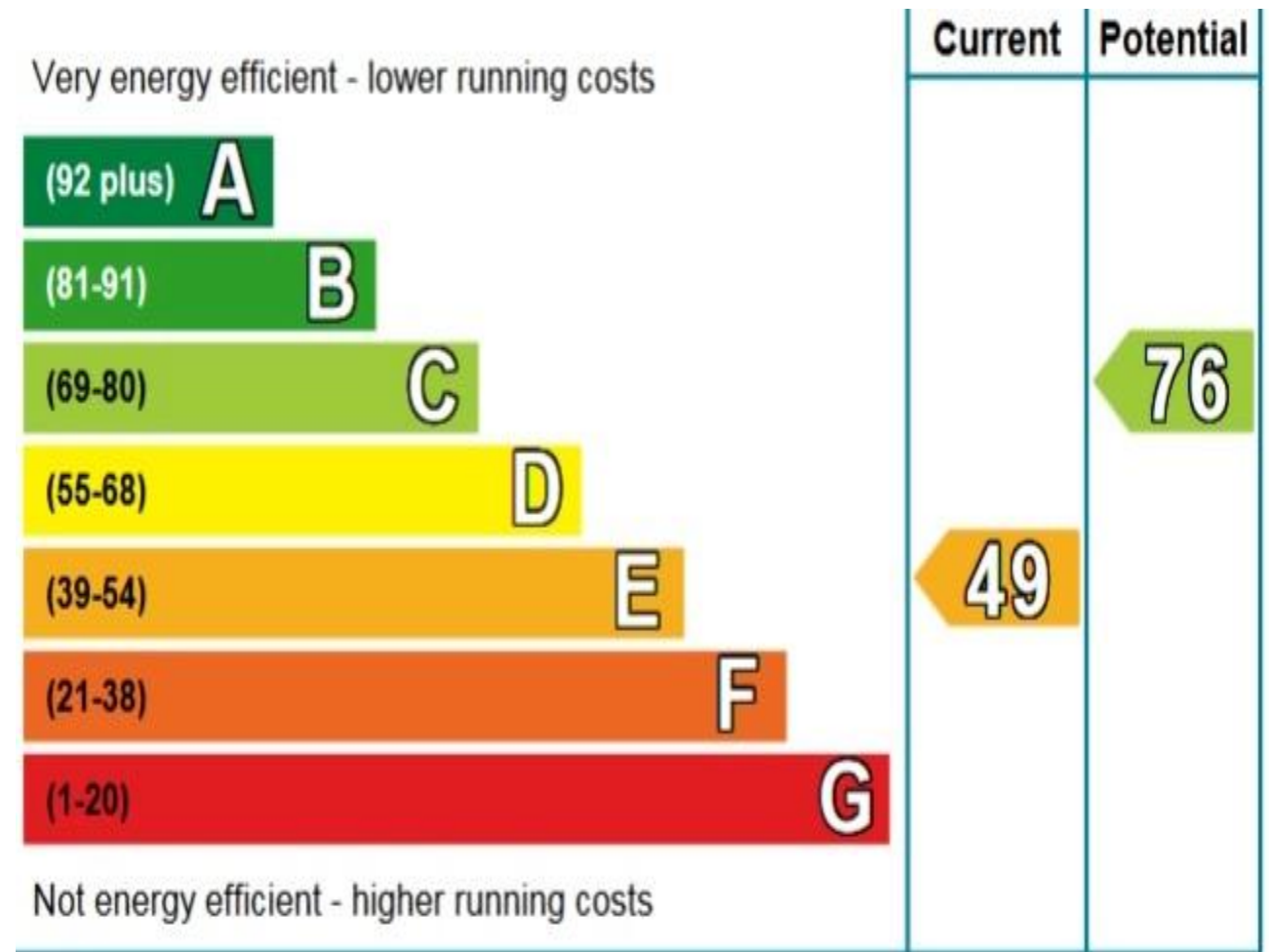
- <https://youtu.be/Ucf0-L8y9Q0>



Courtesy of Stoke Climsland Carbon Zero Homes Project

Energy Performance Certificate (EPC)

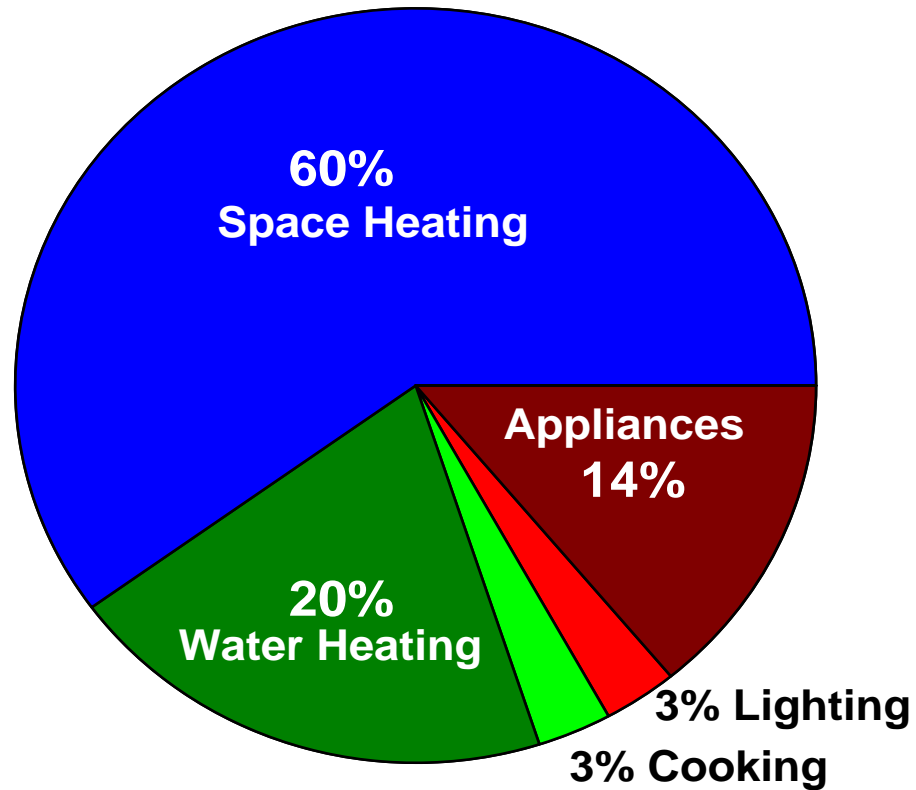
- The current way of understanding the energy efficiency of your home is through the use of an Energy Performance Certificate
- This is needed when a home is bought/sold, rented or when certain retrofit work is done
- Look up your own here (if there is one): <https://find-energy-certificate.digital.communities.gov.uk/>



Retrofit in practice - Householder's Journey

- It's important to look after your home and have a plan for its upkeep and futureproofing
- An initial retrofit advice visit can be a start point
- A whole house survey, done with you, where affordable, or via a grant scheme (e.g. HUG2) can be very helpful
 - Retrofit plan for your home laying out the various measures needed and the order in which the work should be done – fabric first
 - Depending on the work required there may be a need for more, or less, detailed design
- Alternative tools may be available including the Devon Retrofit Guide and the Plan Builder Tool on Energy Saving Devon website: <https://www.energysavingdevon.org.uk/>
- Determine how the work needed can be paid for e.g. own savings, home loan (e.g. Lendology), government scheme(s), perhaps a mix?
- Length of time to do work – could be a 15 year plan, or doable in months
- Choosing installers to do the work

Fabric First – Energy use in the home



- Most energy in the home is used for space heating
- Reducing this is a priority

Fabric First – Reducing heat loss

Heat will always try and escape to the coldest spots.
The goal is to get rid of as many cold surfaces as possible

Loft insulation (~£8/m²)

Room-in-roof insulation

Flat roof insulation (~£40/m²)

External wall insulation (EWI)

~£125/m²

Cavity wall insulation (CWI)

~£9/m²

Internal wall insulation (IWI)

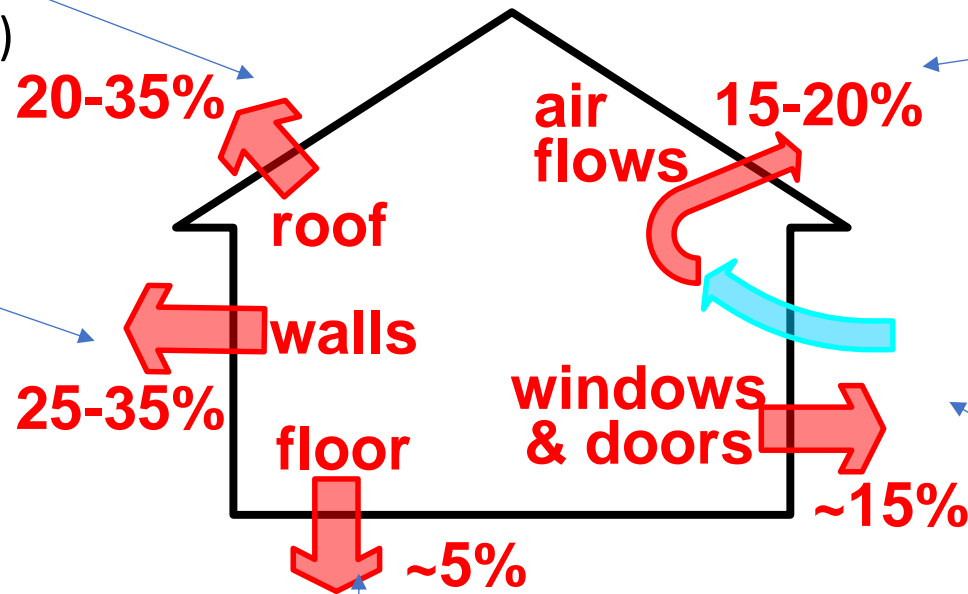
~£182/m²

Party wall insulation (PWI)

~£450/wall

Floor insulation

- Suspended floor (~£35/m²)
- Solid floor



Draught management

- Some airflow is important

Double and triple glazed windows and insulated doors with draught proofing

- Rough cost per window for double glazing £650

Ventilation and Damp

- Ventilation is very important for our health and the health of our homes
- Ventilation is important for managing damp
- Damp surfaces / walls will need approx. 40% more energy to warm them up. It's important to get rid of excess moisture within a home.
- There are various ways of improving ventilation from opening windows regularly, to room fans/hydrostats, to whole house ventilation systems which may cost several thousand pounds

Home maintenance

- Keeping your home in good repair
- Checking guttering and down pipes (rainwater gear) at least once a year; and checking its able to support more intense rainfalls
- Sorting out slipped roof tiles etc. promptly; and keeping roofs free of moss
- Keeping vegetation and soil away from the walls
- Cleaning the exterior including windows regularly
- Maintaining windows and painting wooden windows and doors

Renewable heating and hot water

- Renewable – generated from a natural resource that can be renewed e.g. wind, sun, air, water
- Heating systems can be upgraded once fabric is improved
- If it's done the other way around, your heating system will be too big for your needs, and will be less efficient
- Example costs:
 - Air Source/Ground Source heat pumps ~£12,500 per system
 - Solar PV installation ~ £5000 per system
 - Storage heaters ~ £1000 each (assumes renewable electricity from grid/solar PV)

Heating controls and heat emitters

- Good heating controls are essential
- The householder also needs to understand how to use them properly.
- Heat emitters include radiators and underfloor heating. These should be sized to allow the heating system to be as efficient as possible.
- A renewable heat pump based heating system may operate at lower temperatures and generally requires larger emitters
 - A correctly sized, installed and maintained air source heat pump (ASHP) operates at 300-500% efficiency
 - Electric heaters (e.g. storage heaters) are 100% efficient
 - Gas and oil boilers are generally between 70-85% efficient

What's an average house in Devon and Cornwall?

- All sorts of housing types (stock) across Devon and Cornwall
- Solid wall homes, Cornish Units, Terraces, 1950s-2020s
- Big, small ... in the centre of town, in the country

- Every house is individual, although same types can be similar

- Retrofitting is needed at scale to meet Devon and Cornwall's climate targets
- Retrofitting can be less expensive if groups of properties are done together

- Rough guide price for a whole house retrofit? Very much dependant upon measures needed.

Get in touch and spread the word

- Working with a Retrofit Coordinator / Assessor

Contact Us

- <https://tamarenergycommunity.com>;
hello@tamarenergycommunity.com; 0800 233 5414
- We're also on Facebook and Linked In

Whole House Retrofit Rough Calculations/1

Retrofit - Typical Costs (July 2021)

Measure	Cost (£)	Terraced House		Semi Detached House	
		Area/No	Total (£)	Area/No	Total (£)
Fabric improvement including EWI					
Loft insulation	8	82	656	94	752
External wall insulation	125	134	16,750	150	18,750
Party wall insulation	450	8	3,600	4	1,800
Replacement windows	650	9	5,850	11	7,150
Suspended floor insulation	35	66	2,310	98	3,430
			29,166		31,882
Renewable heat system	12,500	1	12,500	1	12,500
Solar panels	5,000	1	5,000	1	5,000
			46,666		49,382

Whole House Retrofit Rough Calculations/2

Measure	Cost (£)	Terraced House		Semi Detached House	
		Area/No	Total (£)	Area/No	Total (£)
Fabric improvement including CWI					
Loft insulation	8	82	656	94	752
Cavity wall insulation	9	134	1,206	150	1,350
Party wall insulation	450	8	3,600	4	1,800
Replacement windows	650	9	5,850	11	7,150
Suspended floor insulation	35	66	2,310	98	3,430
			13,622		14,482
Renewable heat system	12,500	1	12,500	1	12,500
Solar panels	5,000	1	5,000	1	5,000
			31,122		31,982

Whole House Retrofit Cost Guides

Energiesprong type system approx. per house (£)		80,000
	From (£)	To (£)
Tipperary Energy Agency – Range of spend for whole house retrofit	30,000	69,000
Homebuilding & Renovating – Range of spend for a passivhaus retrofit - £800-£1000 per m2. For an 80m2 house cost range would be:	64,000	80,000
	Victorian Terraced House (£)	Small 1930s semi detached house (£)
Whole House Retrofit rough calculations with EWI	47,000	49,000
Whole House Retrofit rough calculations with CWI	31,000	32,000

References:

Tipperary Energy Agency - <https://superhomes.ie/what-is-deep-retrofit/>

Homebuilding and Renovating - <https://www.homebuilding.co.uk/advice/enerphit>

Retrofit Service for Devon

- We're working with Devon County Council and our Community Energy colleagues across Devon to launch a **Retrofit Service for Devon** in spring 2022. This will provide a 'one front door' approach for retrofit advice and support.
- If you'd like to know more or register your interest please drop us an email to hello@tamarenergycommunity.com.
- It would also be helpful if you could take a few minutes to complete this **Retrofit Devon householder survey** to help us understand more about about what the levels of interest in retrofit across the county. You can find it here: [Retrofit Devon householder survey \(typeform.com\)](https://tamarenergycommunity.com).

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