Retrofitting in Practice
What does this mean

TEC Talk! … 23rd September 21

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Devon Climate Emergency

Tamar Energy Community

Devon Community Energy Network

Introduction to TEC and community energy across Devon

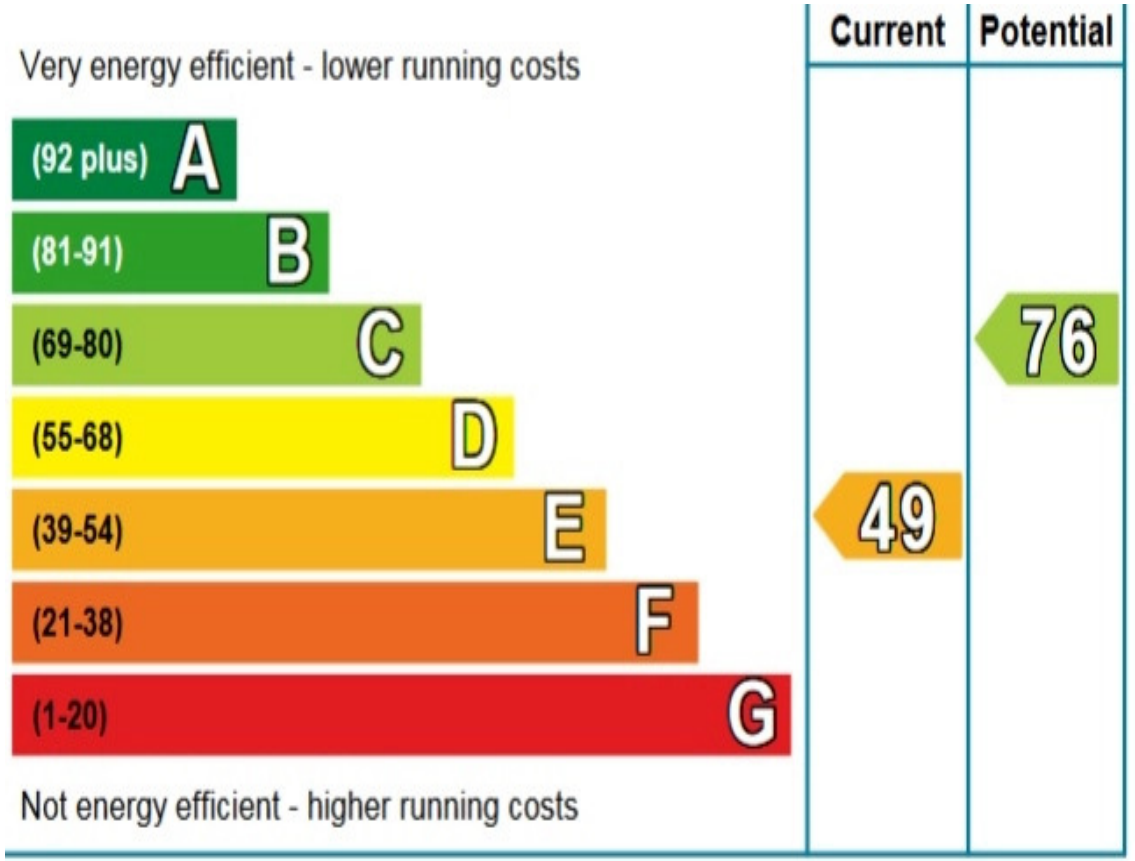
- Community energy organisation (CEO) operating across West Devon and SE Cornwall
- We
  - Provide energy advice and support to the vulnerable, fuel poor and those ‘able to pay’
  - Develop and own community scale renewable energy (7 solar rooftop systems generating 427 kWp)
  - Look at opportunities 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 Devon CC we’re developing a ‘one-stop shop’ for Retrofit for Devon
- DCEN members own and run a development CIC for larger scale renewables – Devon Energy Collective

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

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/

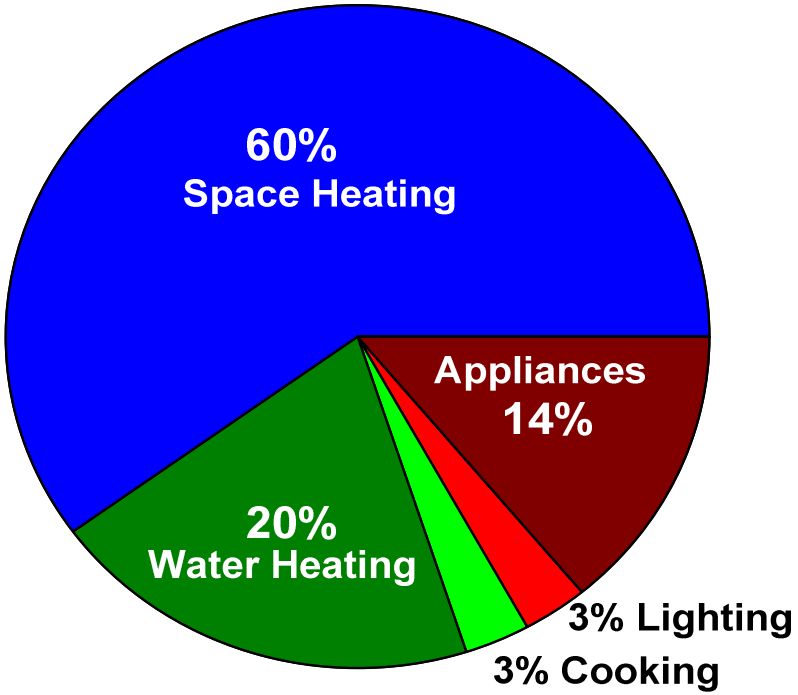


Retrofit in practice - Householder's Journey

- Whole house survey, done with you
- 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

- Determining how the work needed can be paid for e.g. own savings, home loan, 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



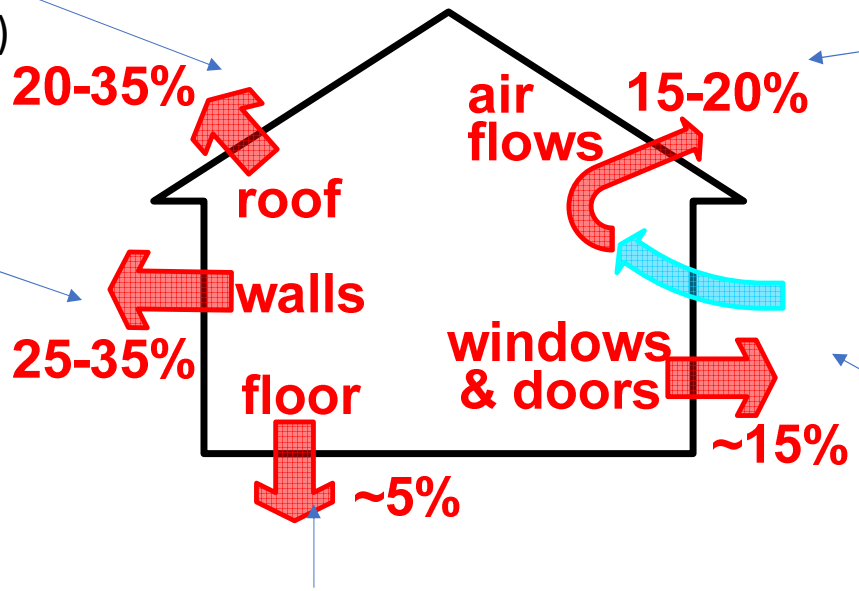
- Most energy in the home is used for space heating
- Reducing this is a priority

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



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

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

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

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 its 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

What's an average house in Devon?

- All sorts of housing types (stock) across Devon
- 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's climate targets
- Retrofitting can be less expensive if groups of properties are done together

- Rough guide price for a whole house retrofit?

Whole House Retrofit Rough Calculations/1

Retrofit - Typical Costs (July 2021)

		Terraced House		Semi Detached House	
Measure	**Cost (£)**	**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

		Terraced House		Semi Detached House	
Measure	**Cost (£)**	**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**

Following Up

- **Farmers Market Tavistock** – Sat. Sept. 25th – 09:00 to 13:00
- **Tamar Energy Fest** – Sat. Nov 13th – Butchers' Hall Tavistock – 10:00 to 15:00
- **Open Homes Fortnight** – Nov 1st to Nov 13th . If you're proud of something you've done in your home, or even if you've had a disaster with lessons learnt … and are prepared to share your experience(s) with others please let us know. We're re-kindling our Open Homes network across Devon.
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  We're also on Facebook and Linked In