Net Zero, Energy & Housing

What you need to know...

Normally a double act

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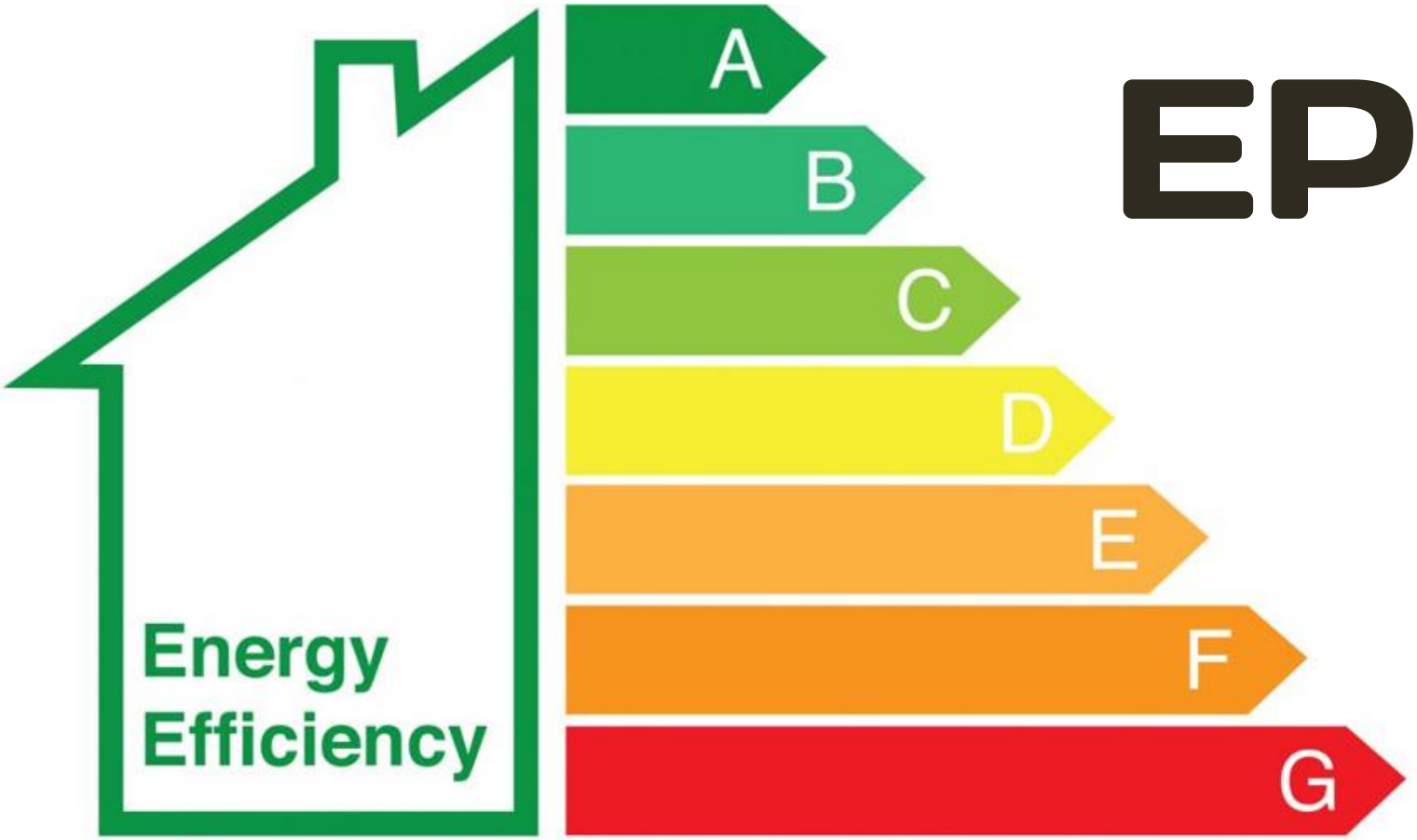
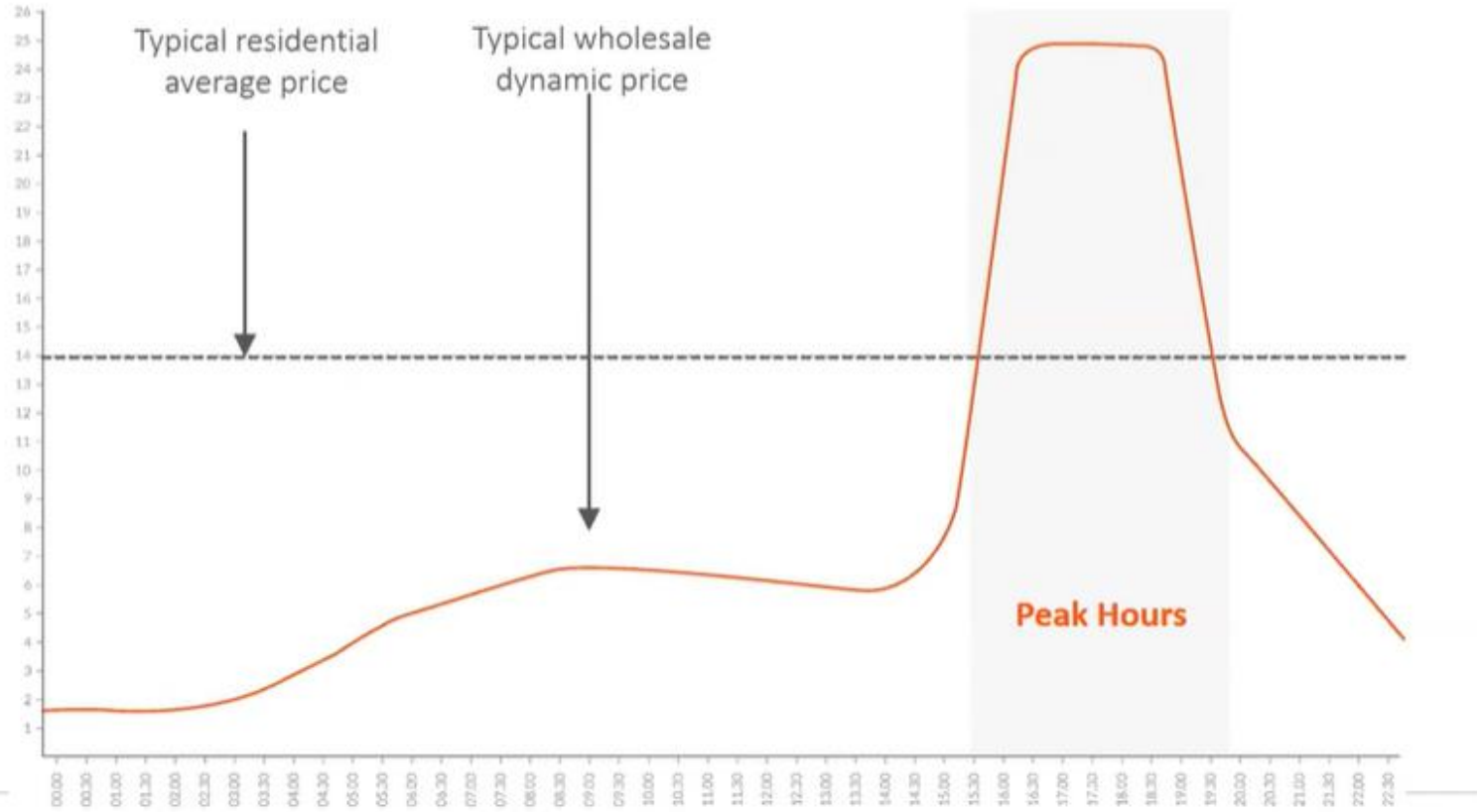
Before we start - 3 quick points



EPC

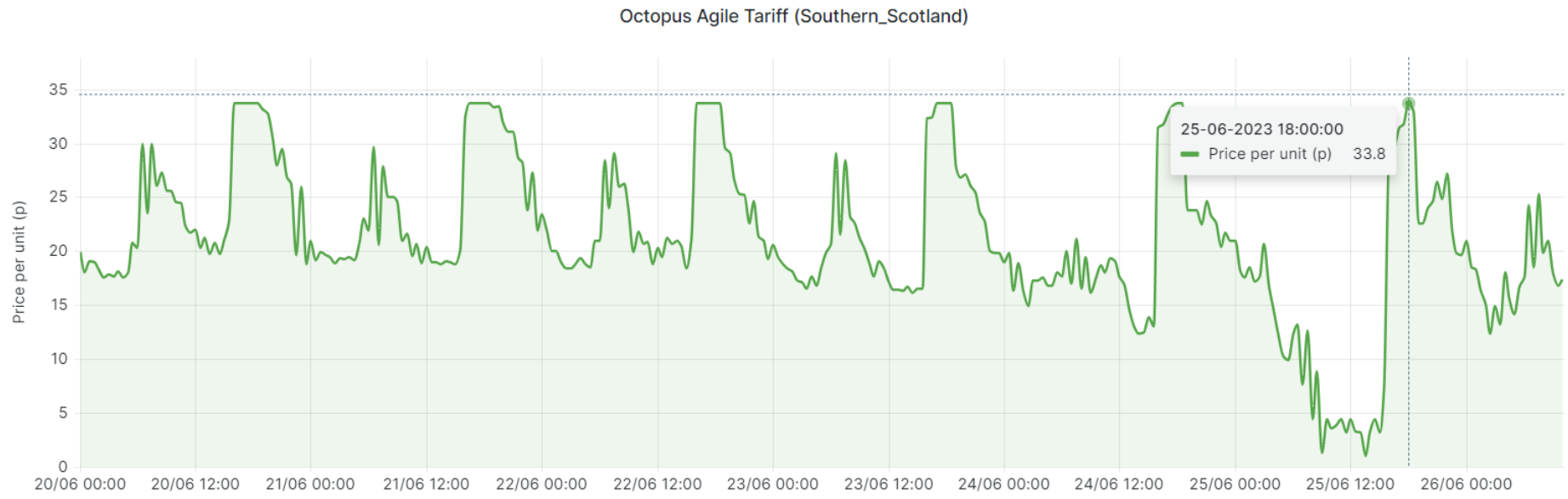
UK Energy Prices over typical 24 hours



Time of day matters for appliances

2am = 12p a unit,
6am = 24p a unit,
6pm = 34p a unit
Southern Scotland = 31.3p

Pricing for the latest 48 hours



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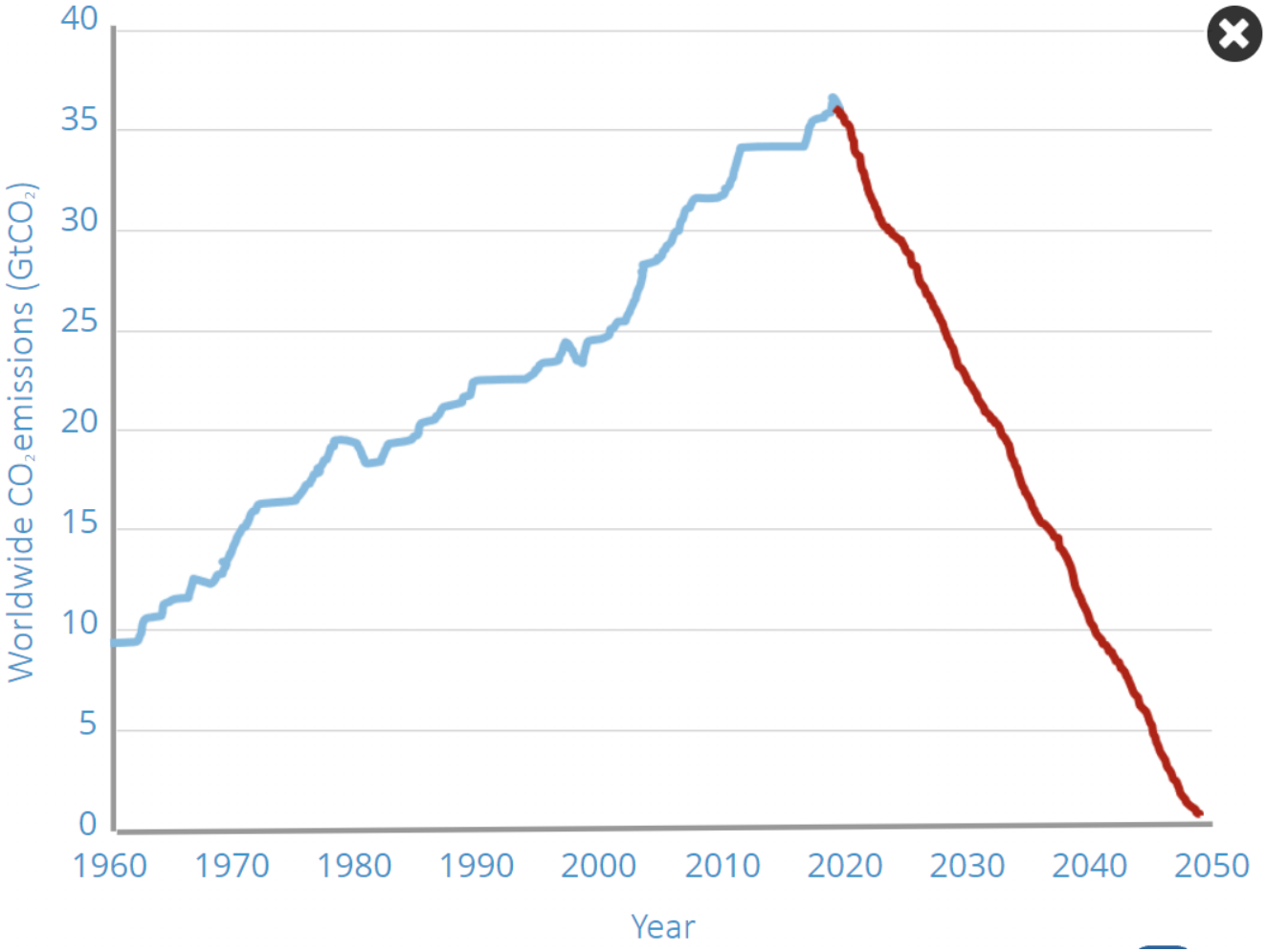
Section 1

Setting the Scene for Net Zero Housing

Why this is important?

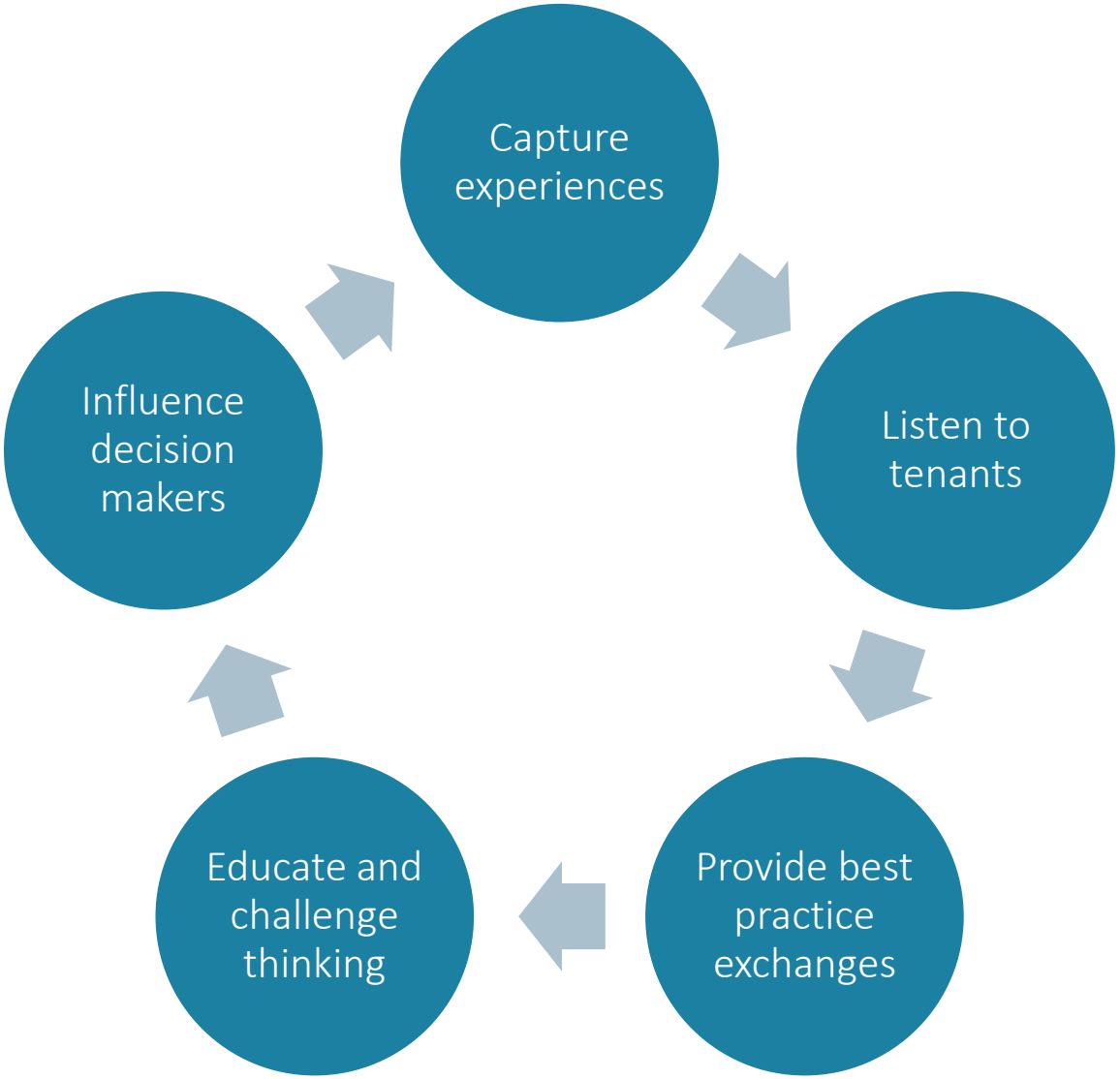
1. Net Zero is the biggest issue in social housing for the next 15 years
2. The Cost of Energy Crisis is one of the biggest issues facing tenants
3. TPAS Cymru supports the move to lower energy usage in a more sustainable way.
4. Social housing moves faster than other tenures, so will see benefits quicker
5. However, tenants are rightly concerned about being guinea pigs with solutions with limited track record and unclear support. Tenant collaboration is key.

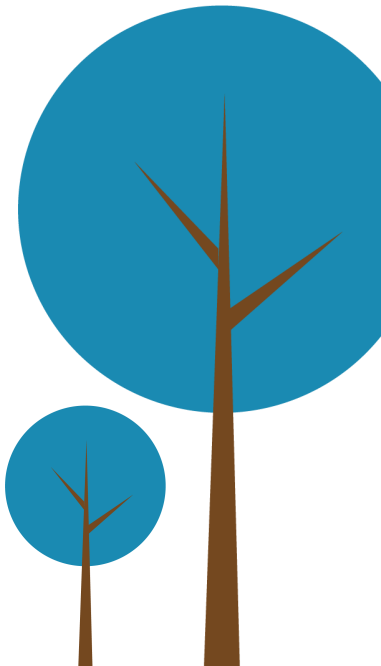
Can't spend 10 years talking as the line gets steeper



TPAS Cymru's response

We have resourced a role to





New opportunities Net Zero creates

New skills, higher pay

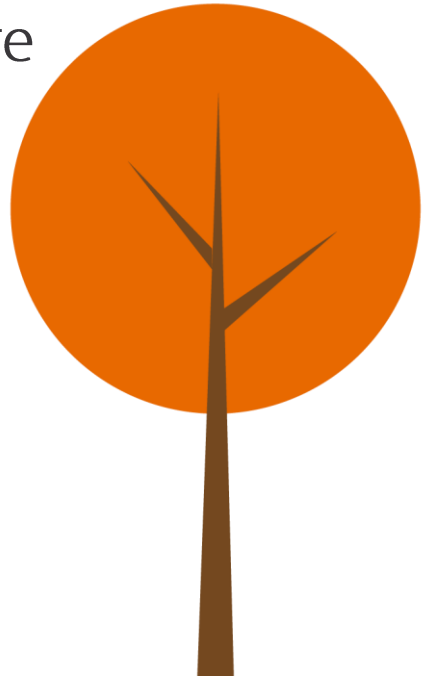
Increase in supply chain jobs

Energy independence

- Inc new micro generation opportunities

Potential communal energy opportunities in future

Opportunity to create more resilient communities



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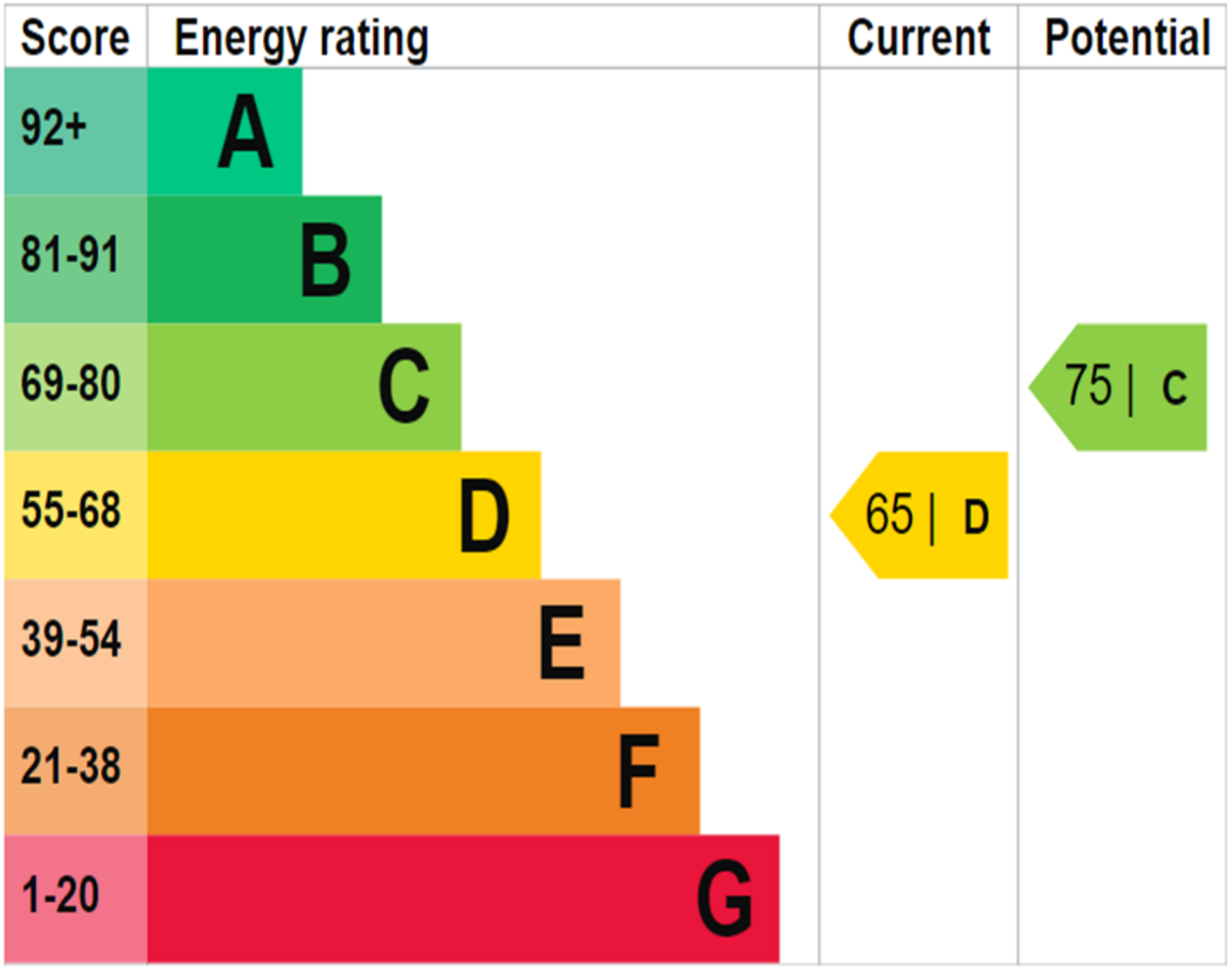
Section 2

Energy Performance Certificates -


Score
Energy rating
Current
Potential
92+
A
81-91
B
69-80
C
55-68
D
39-54
E
21-38
F
1-20
G
65 | D
75 | C

What's your EPC rating??

Scan the QR code with your phone, this'll take you to gov.uk, 'Find your energy certificate.'

Enter your type of property and post code, the site will pop out the details of your EPC rating and what you can do to raise your EPC rating.

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EPC (UK) awareness

A poll by Skipton Group of 2,000 adults (Jan 23) who own a home, found two-thirds are unaware of what their energy performance certificate rating is.

84% of all the homeowners polled estimate theirs would be C or above.

59% of domestic properties have ratings between D and G, leaving them vulnerable to higher bills.

What difference does EPC really make?

Energy bill difference between an EPC A and EPC G rated standard home is **£1,500 a year.**

About £250 savings with each increase in rating (going from C to B, B to A, etc).

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Section 3

Net Zero Jargon, Policy, and Other Terms

Fabric First

‘…Build tight and ventilate right…’

Current thinking: All homes should be adapted using fabric first approach :

That is, the buildings will be constructed to highest possible insulations standards- to ensure low running costs and to alleviate fuel poverty.

Retrofit

Process of making **existing** housing stock more energy efficient.

Involves improving a home's thermal performance and making a home more comfortable.

Social Housing is going to be retrofitted.

The Whole Home Survey

- Each home will need to have a survey done to see which how their home can be retrofitted and made more Net Zero
- Pathway to Zero for each home
- Looks in detail at the home

  -Windows, doors, roof space, ventilation, installation etc
- Issues

  -How many qualified people are there to carry this out?

  -Who is training new surveyors?

  - There needs to be a massive increase in trainings being done for NetZero to be possible

TPAS Cymru uneasy with desktop based computer analysis

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Section 4

No single Approach to Making Housing Net Zero

The cheapest unit of energy is the energy unit not used

Reducing consumption makes a big impact on bills

The Impact of Insulation

Energy Balance - Active vs Passive

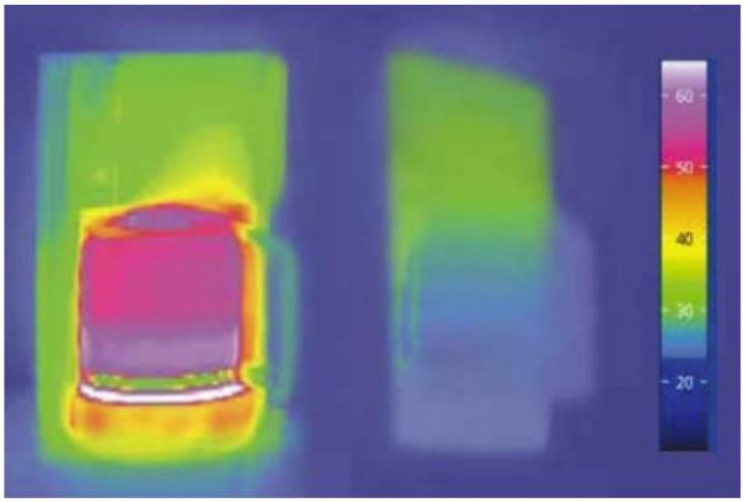
The basic principle of Passivhaus is very simply- keep the heat in the building so you don't need to use a lot of energy to keep it warm. The different between an insulated coffee flask and a coffee jug on a hot plate illustrates this principle nicely.

Active

A coffee machine requires constant, active energy input to maintain heat

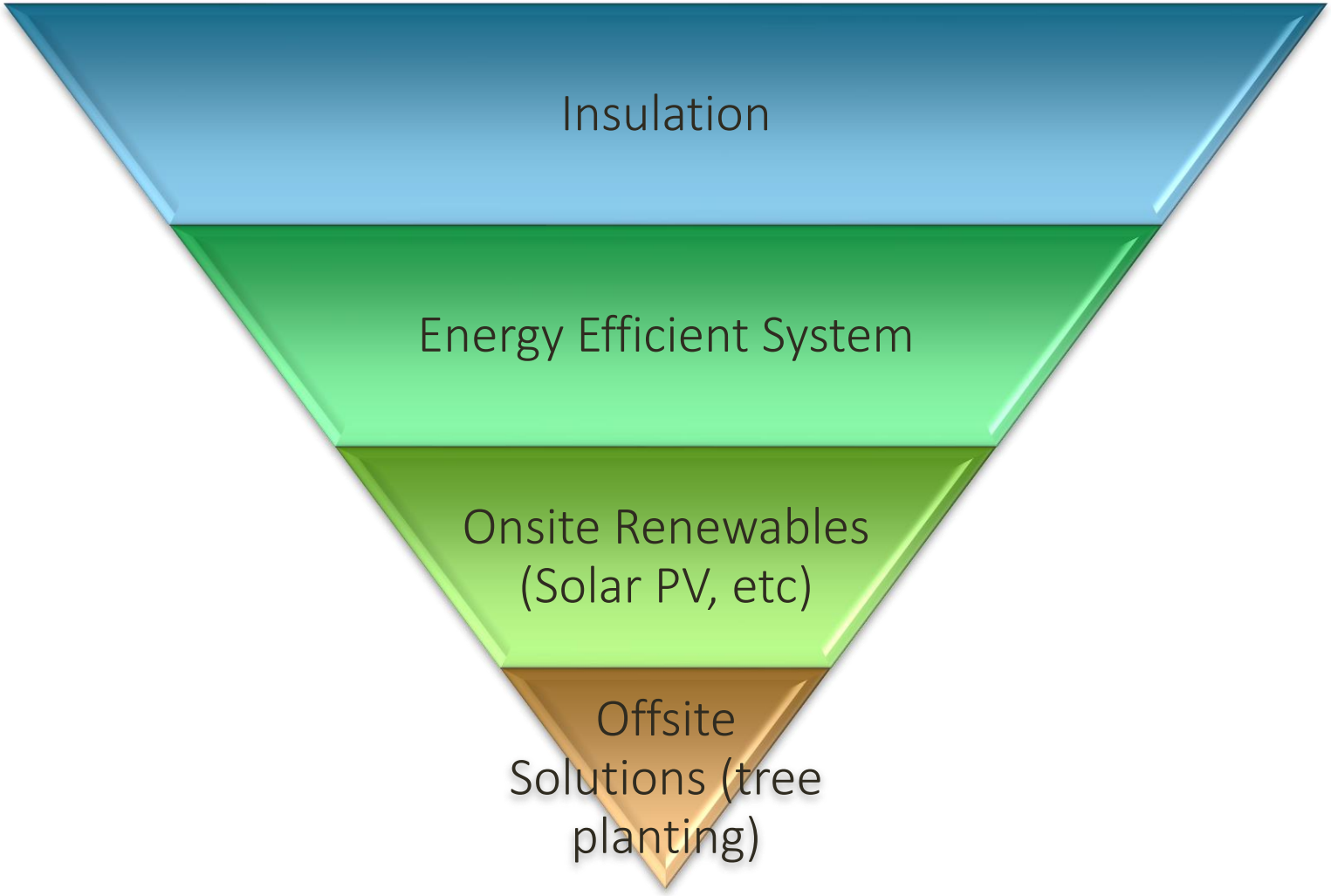
Passive

A thermal carafe's insulation helps maintain heat passively



Passivhaus Institute, PHI

Pyramid to Low Carbon Housing



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Section 5

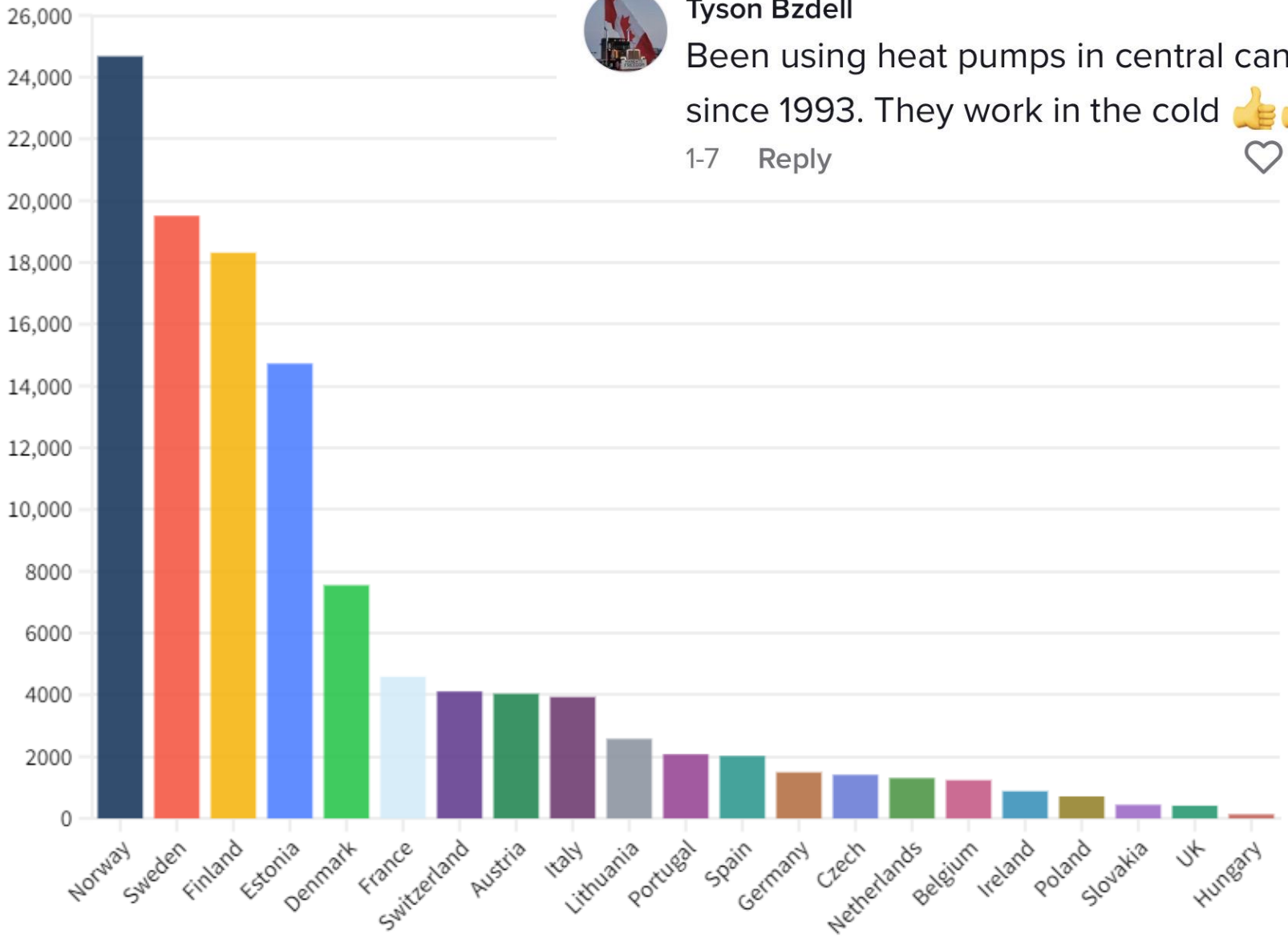
Heatpumps

HEATPUMPS are NOT new

Heat pumps take warm air from outside and help turn it into energy to heat the home

- 60% of homes in Norway have a heat pump. Sweden and Denmark not far behind
- Poland massive upscale in last 18months

Heat pumps per 100,000 people



Tyson Bzdell

Been using heat pumps in central canada since 1993. They work in the cold 👍👍

1-7 Reply 2

Greenpeace endorsed

'…They're a crucial tool for tackling climate change….'

'..Heat pumps are the future of home heating…'

https://youtu.be/HsFFJTB16N0

CAROLINE JONES

Campaigner at Greenpeace UK

GREENPEACE

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Type 1 : Air Source Heat Pumps

What is an air source heat pump (ASHP)?

A heat pump works differently to a gas boiler. It uses the warmth found in the air outside of your home – plus electricity – to supply your home with all the heating and hot water it needs.

Uses the same technology as a refrigerator, but in reverse!

The whole process only uses electricity and even works when it's as cold as -15°C during the winter.
All air contains energy unless its 0Kelvin (-273degree centigrade)

Much better for the environment – cutting your home's CO2 emissions and improving local air quality

Air source heat pumps

Sits on the outside of a property - a great option for more populated cities or communities.

There are lots of different suppliers that offer different types of air source heat pumps that cater to different needs.

Can be purchased at more affordable prices with the help of government grants and incentives.

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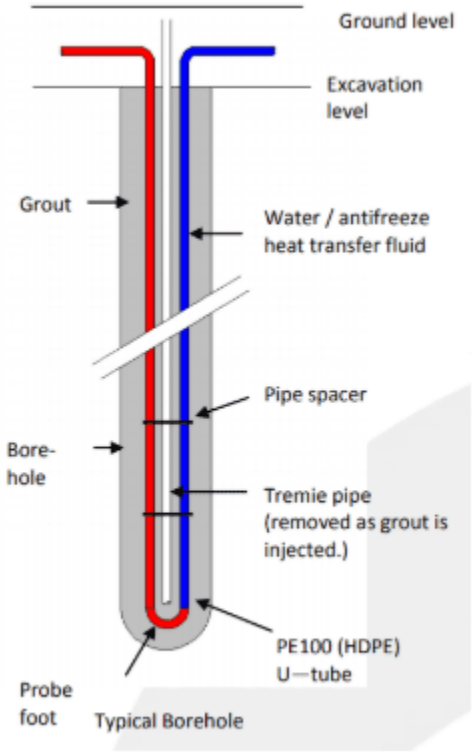
Type 2 : Ground Source Heat Pumps

Vertical or Array?



Down (vertical) is better as it reaches warmer ground.

However, you need to have the garden space.

There needs to be access to a drilling rig.

Costs more to install.

Sounds good, can I have one? (ground source)

- Whether vertical or an array, they cost more than air source heat pumps.
- Needs some land space for an array, or need to get a drilling rig into the garden for vertical
- Verticals are more often on new builds where you can drill down as part of the ground works
- Frequently we see this type of comment '……..can't really justify the substantial cost of the drilling/digging for only 10-20% gain in efficiency. Where ground source really shines is in extreme cold temperatures where it still has a decent COP

Critics of heat pumps

- Do we have enough skilled installers? (On call, local maintenance/repair skills)
- Bigger radiators
- Need a traditional hot water tank installed (many have lost the space for a tank now)
- Still needs maintenance and servicing - moving parts, leaks, pressure resets
- Always on, even in summer
- It has to do a weekly legionella cycle - paying for weekly system checks, flush and reset
- Noise of a boiler - sensory flooring vibration

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Section 6

Infrared/Radiant Heating

Not this!

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So what is it?

- Infrared heating uses the radiant heat spectrum to create and target heat. Usually installed in ceiling under plaster or sometime panels on walls
- Instead of directly heating the air in a room, IR heats the people, objects, walls, ceiling and floor evenly
- Lots of testimonials talk about the heat – it is very similar to the feeling you get from the sun
- Also referred to as Radiant Heating, Infrared heating, Far Infrared, Graphene Heating

Why landlords like it

- Easy to install - just a standard electrician
- No special skills or training
- Quick to install
- Lifespan - most suppliers claiming 20-30 years, (in comparison Gas boilers and Heat pumps 10-15 years max. Likely just replace sensors and controllers
- No pipes, maintenance, no moving parts
- Good for dew point/zapping on damp & mould

Why tenants like it

- Free up space in rooms – no rads, no heat pump or boiler
- The fastest way to heat up you/room
- People set it as a lower temp as it is efficient at heating you and room.
- ‘Feels like sunshine’ ‘a nice heat’ ‘nicer than stuffy central heating’
- Greater control of on/off – don’t use it when don’t need it
- Installation on ceiling - less disruption
- Claims of less dust as no radiators, pipework, boilers etc
- Whole room heated evenly

Challenge of radiant heating

1) It's only a heating system,

2) Cost Dilemma – it's easy to install, cheaper to maintain, longer life etc – all great for landlord, but without solar PV or battery to charge at cheap hours, it could cost tenant more to heat home.

3) Controls – zoning, timers to give you the control you want

4) Energy efficiency - its a 1:1 energy product compared to 1:3, 1:4 for HP – Don't get the SAP points

Want to learn more?

3min explainer

Is Radiant Heating the Answer to Low Energy Heating?

1hour 15mins Webinar

Webinar: Radiant Heating, a tenant perspective

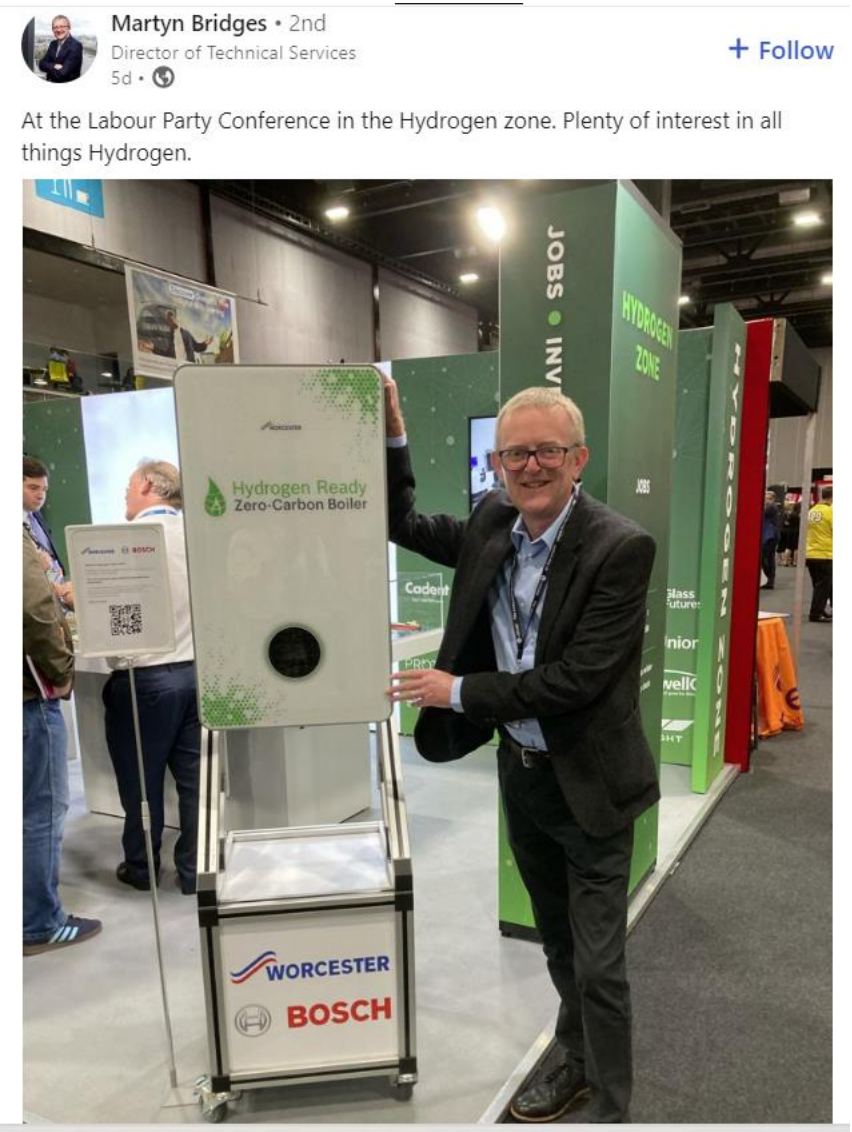
Section 7

Hydrogen

Is this the great Net Zero solution?

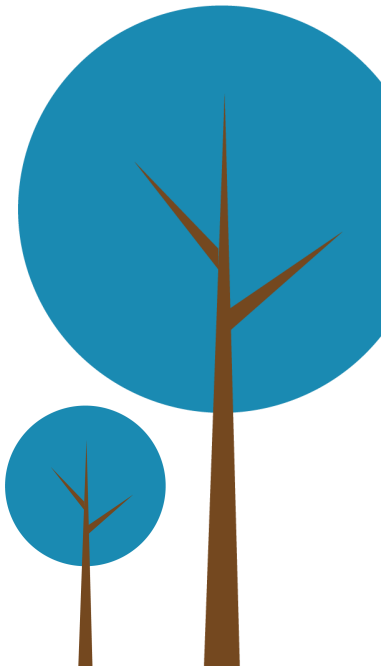
or

a way for ‘big oil’ (and its hangers on) to stay in business?



Positives of Hydrogen

- It doesn't release CO2 when burnt
  (massive assumption the Hydrogen was made in a green way)
- It can be made from water, which is limitless
- Could be used to capture/store excess renewable power and used on demand

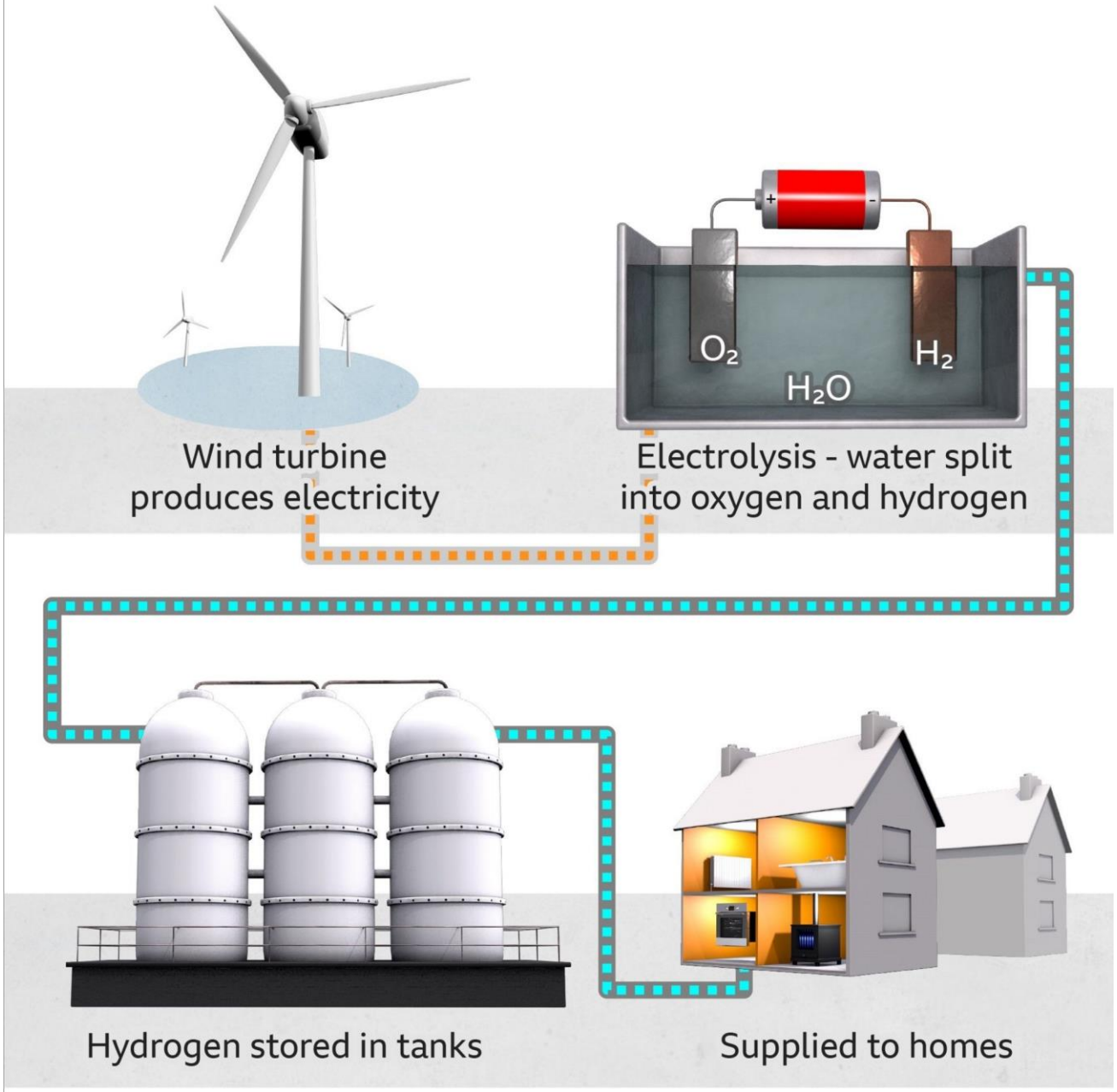


How you make, store, and transport the hydrogen is the BIG issue

Making Hydrogen

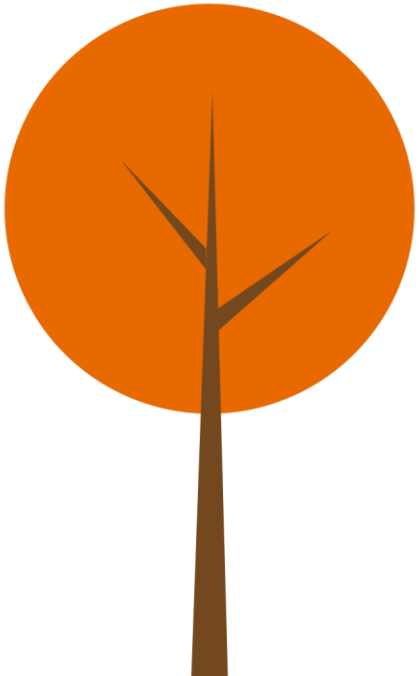
1. Green Hydrogen – made by splitting water using wind turbines.
2. Yellow Hydrogen – made from power from the grid. mix of all sorts of electricity sources to make it
3. Pink Hydrogen – made in reactors of nuclear power stations
4. Grey Hydrogen - made from natural gas (methane) by mixing with steam at high pressure. Creates C02.
5. Blue Hydrogen – grey hydrogen that has had the C02 captured and stored
6. Black/Brown – made from Coal using gasification

How green hydrogen gas can power homes



Challenges of Green Hydrogen

- Little green hydrogen right now, and what there is could be used better to decarbonise other processes that rely on (high carbon intensive) hydrogen
- To make green hydrogen you need to use so much renewable energy. Its a really inefficient process
- Consequently UK homes with green hydrogen would use six times more renewable energy than heat pumps.
- The hydrogen would be expensive compared to alternatives.



In one corner.....

ExxonMobil

Chevron

bp

ConocoPhillips

TOTAL

Vokèra

WORCESTER Bosch Group

ideal

BAXI

INTERGAS

Glow•worm

POTTERTON

Alpha HEATING INNOVATION

Vaillant

VIESMANN

"I think hydrogen is ultimately the silver bullet,"
Jacob Rees-Mogg, the UK's energy minister Sept 22

In the other corner…..

Heating homes with hydrogen is bad for both your wallet and the planet

A review of studies looking at heating homes with hydrogen has found that high cost and poor energy efficiency means the gas isn't a viable solution, despite many governments pushing ahead with the idea

ENVIRONMENT | ANALYSIS 27 September 2022

By Philippa Nuttall

However we need Green Hydrogen.

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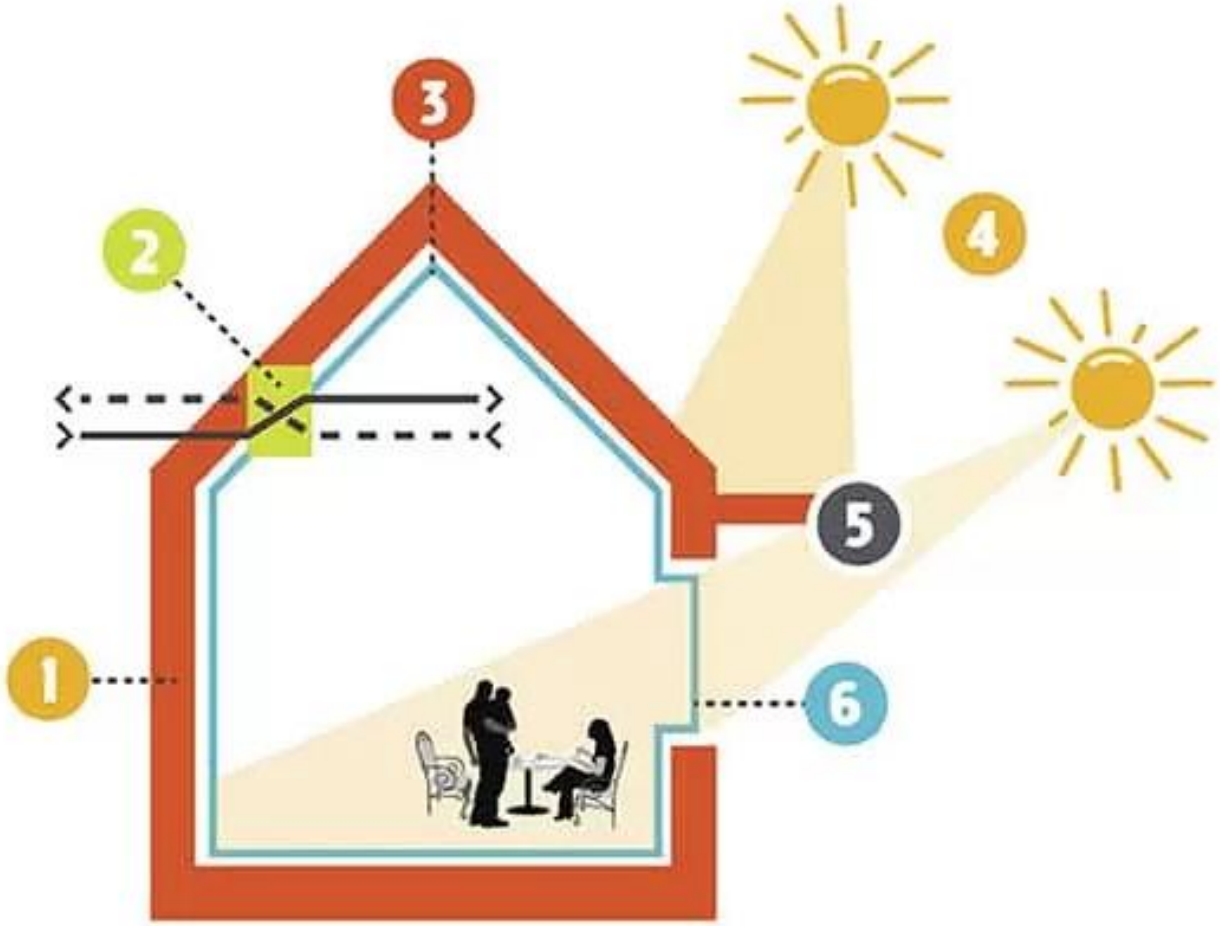
PASSIVHAUS PRINCIPLES

key elements:

1. HIGH INSULATION
2. BALANCED VENTILATION WITH HEAT RECOVERY
3. AIR TIGHT ENCLOSURE
4. SOLAR ORIENTATION
5. EXTERIOR SHADING
6. HIGH PERFORMANCE WINDOWS



Thermal Batteries

- It's a hot water system not roomheating (Melin combined this with radiant heating)
- Used when large hot water cylinders are not a good option
- No regulatory annual maintenance, no legionella testing, they are a lot smaller
- Can be charged by a heat pump or solar PV
- Sunamp and Tepeo are popular brand
- Great video explainer https://www.youtube.com/watch?v=t1x4J2c7v9I

The Perfect Boiler Replacement? Tepeo's Zero Emission Boiler

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Section 8

Opportunity to ensure all benefit from solar?

Solar Panels

A panel designed to absorb the sun's rays as a source of energy for generating electricity or heating.

Communal flats

https://youtu.be/Cjo34ps3a98

Why we need new solutions

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Section 9

Some of the issues to be considered

Battery Placement

Questions to ask

Indoor or outdoor?

Which last longer?

Which performs better?

What consideration has been given for placing outdoor

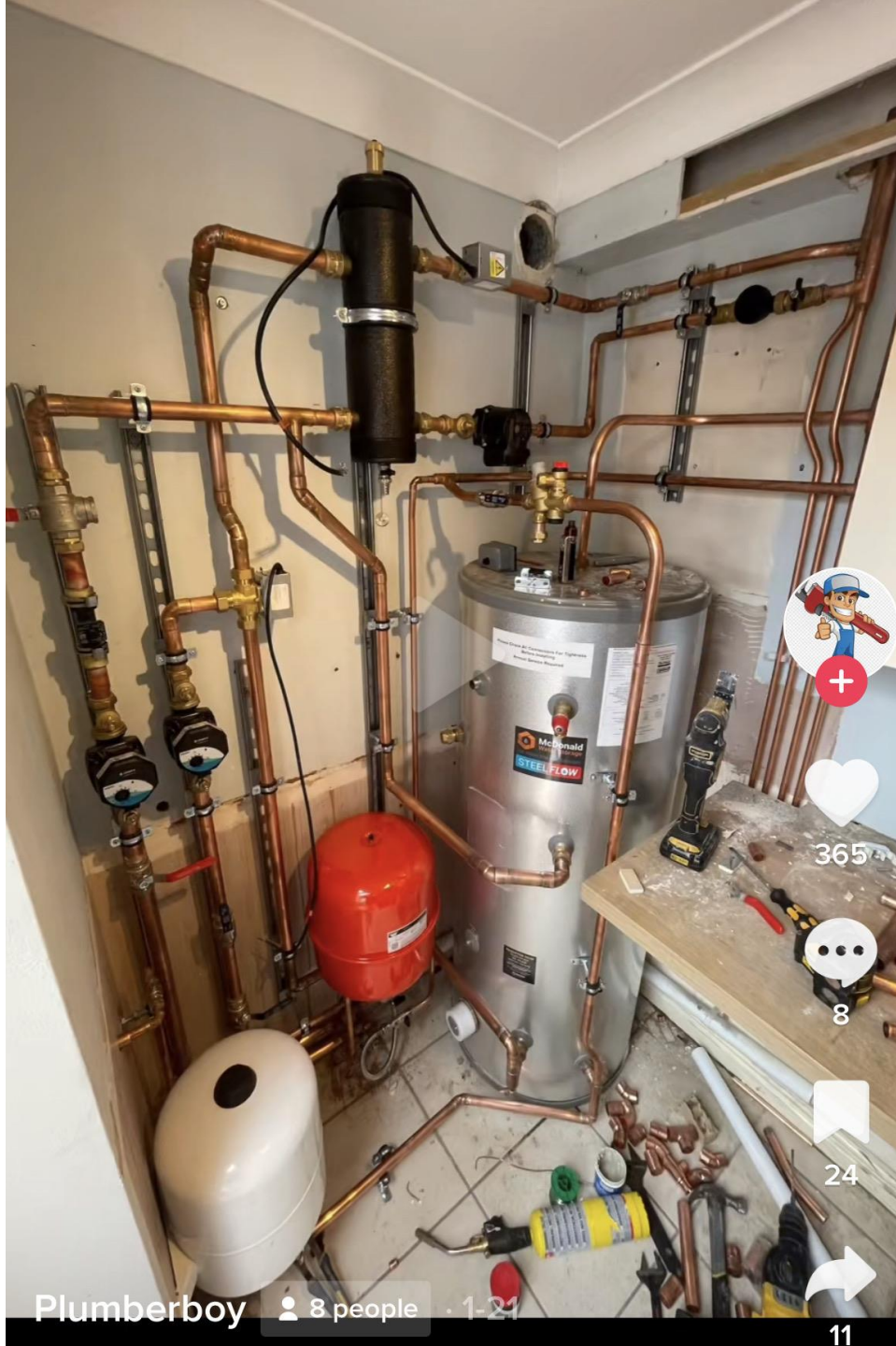
1. Protection from rain/water getting in
2. Direct sunlight
3. Too cold
4. Security

Internal vs. External Insulation

External insulation will change the entire look of a building, would this bother you?

Internal insulation makes a room a bit smaller, but not by much


365
8
24
Plumberboy
8 people
1-21
11


365
8
24
Plumberboy
8 people
1-21
11

For discussion groups - what do YOU want from a future heating and hot water system?

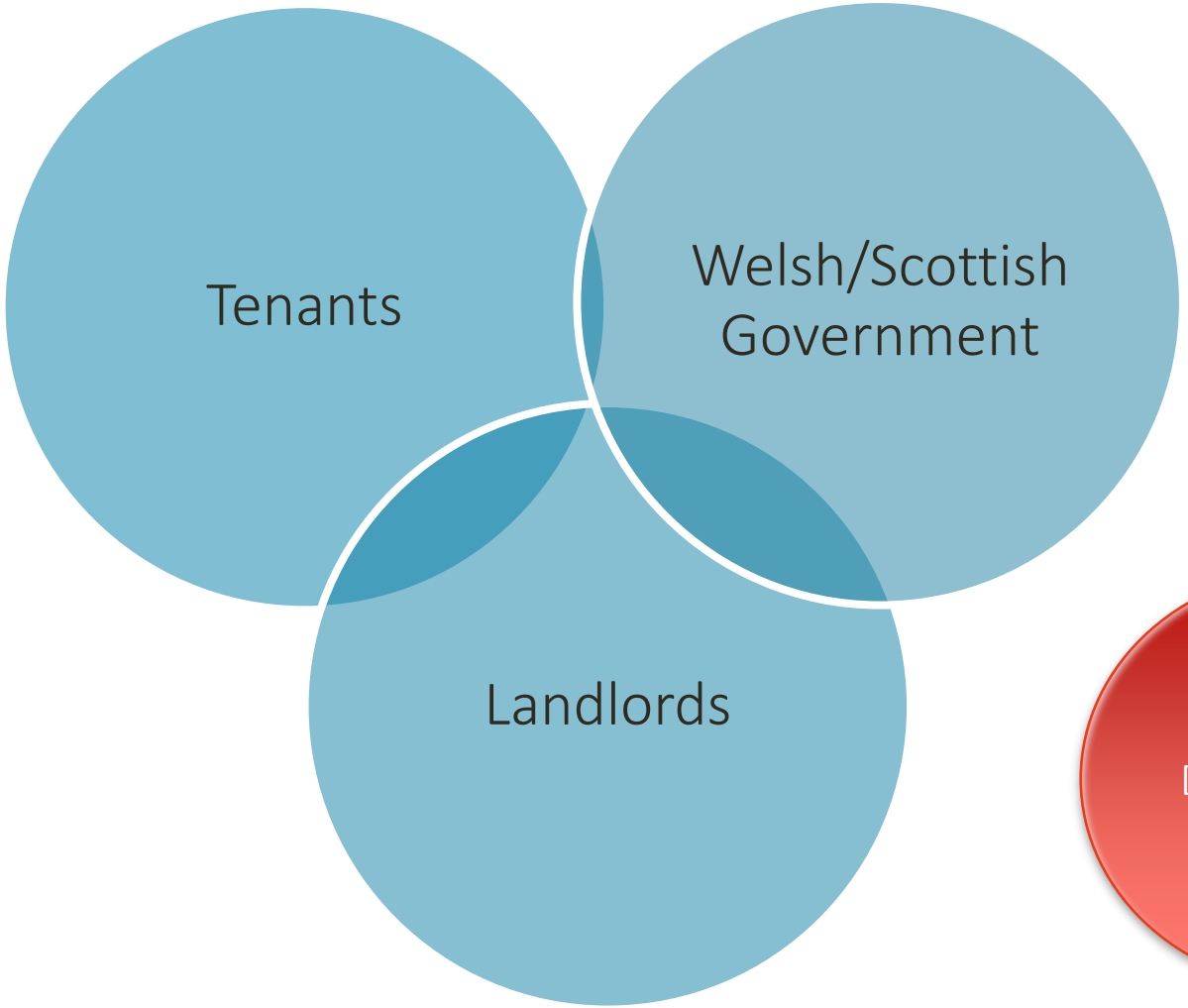
Tenant

- The most advanced heating system needs to be:
- Easy to install
- Low energy
- Effective
- Long lasting
- Comfortable
- Safe
- Easy to understand

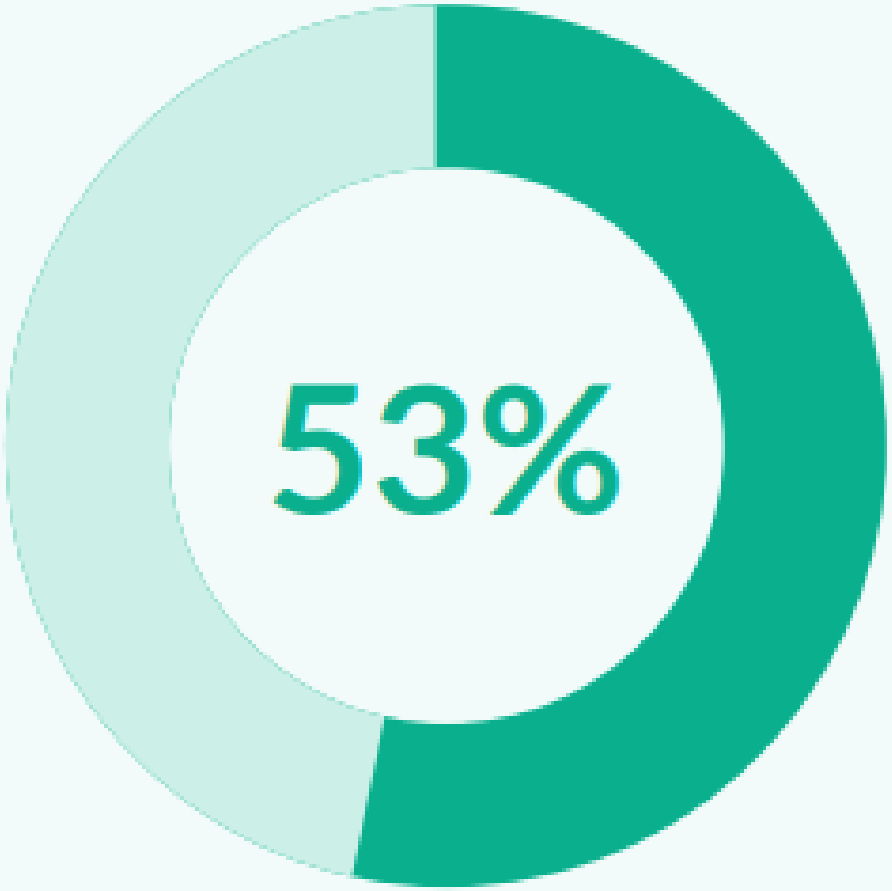
Landlord

- Are they the same as tenant?
- Affordable to install
- Maintenance free

How will Retrofit be paid for?



UK Gov? Saving to DWP? Support payments? NHS?



53% of renters surveyed by LettingaProperty.com were prepared to pay more for a greener property

Think points

Do you convert (Retrofit) a whole home one by one, or do half now to more and come back and finish of

Think points

Are we trying to reduce tenants' bills or reduce Carbon footprint

Pre-pay meters issue

Your solar panels stop generating free electricity if your pre-pay meter runs out.

Will the PV panels still provide me with electricity if there is a power cut or I run out of credit on my prepayment (pay-as-you-go) meter?

No. If there is no mains electricity supply to your house, the solar panels are unable to provide electricity to use. This applies when there is no credit on a prepayment meter, the mains electricity has been switched off at the fuse box, or there is a power cut.

The way the PV electricity is produced means that the inverter in the loft needs a trace of electricity (electrical resistance) from the grid to make the electricity usable in the home. The inverter changes the current from the panels from direct current (DC) to alternating current (AC) that can be used in the home.

Please note: Even when the main fuse board for the house is switched off the panels will still generate electricity to the inverter in the loft and the cables will still be live!

wdh

Changing climate

‘Switch off’ for repairs and replacements?

Thermal turnaround: German government settles dispute over heating law

politico.eu • 3 min read

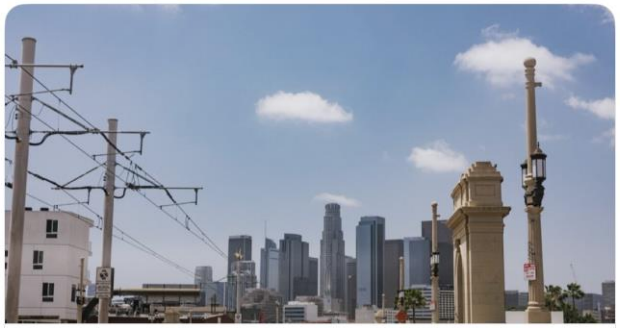
4:27

@mzjacobson

Common sense

Los Angeles Will Require All New Buildings To Be Electric-Only in 2023

-Induction cooktops instead of gas stoves
-Heat pumps instead of traditional heat and air conditioning
-No fireplaces or outdoor fire pits that burn gas



laist.com
LA Will Require All New Buildings To Be Electric-Only. But Are We Ready?

10:34 am · 29/12/2022

Tweet your reply

Some other questions/ dilemmas

What happens if its not economical to do the work Exemption? Rent discount? Sale?

Can the tenant say no? Climate change is bigger than not wanting a new kitchen?

What solutions are best for the organisation v's best for the tenant (collectively and individually)

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David Wilton

Questions? Thoughts?

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