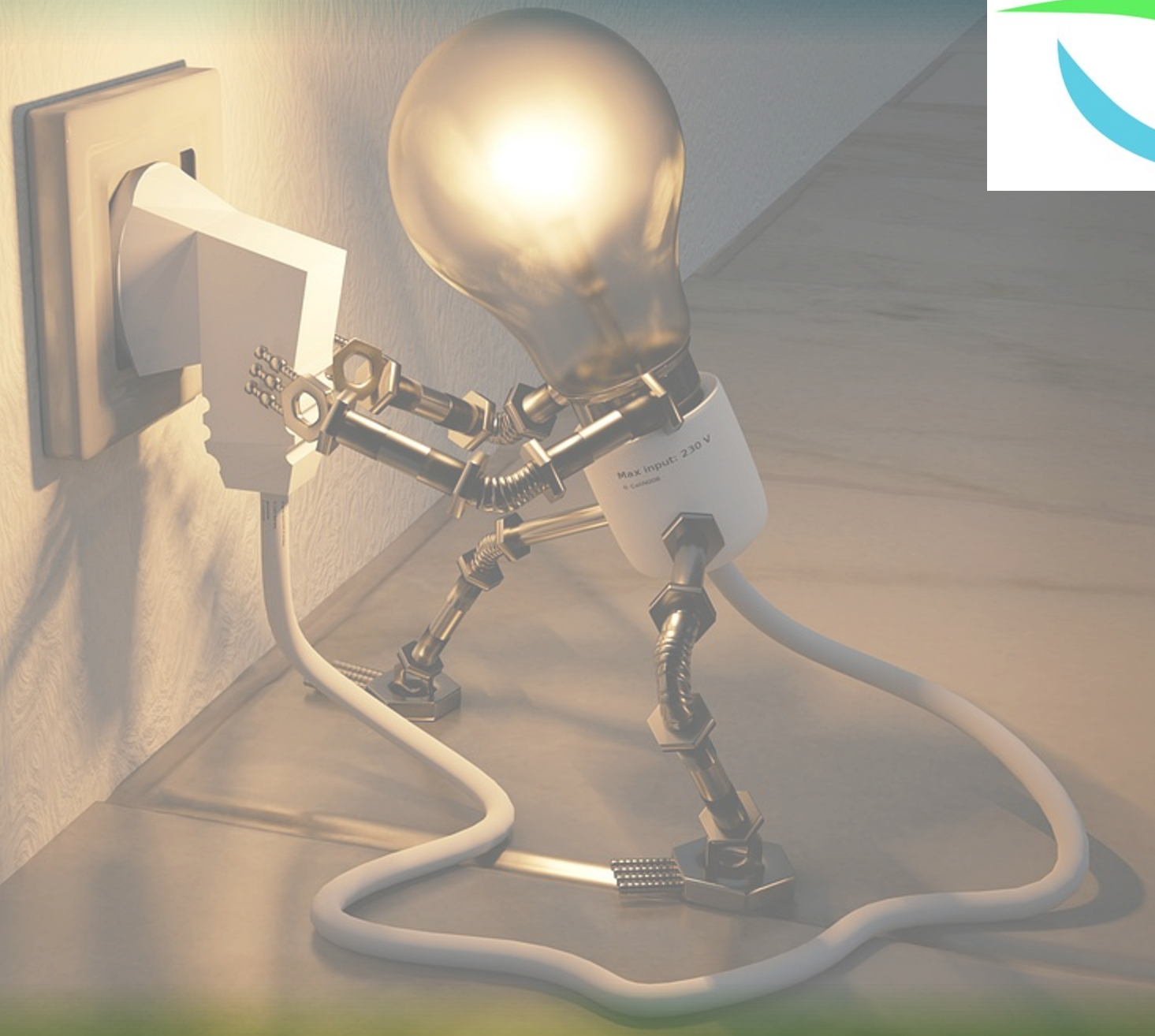
Energy and estates



Dr Matt Sawyer

Oct 10th

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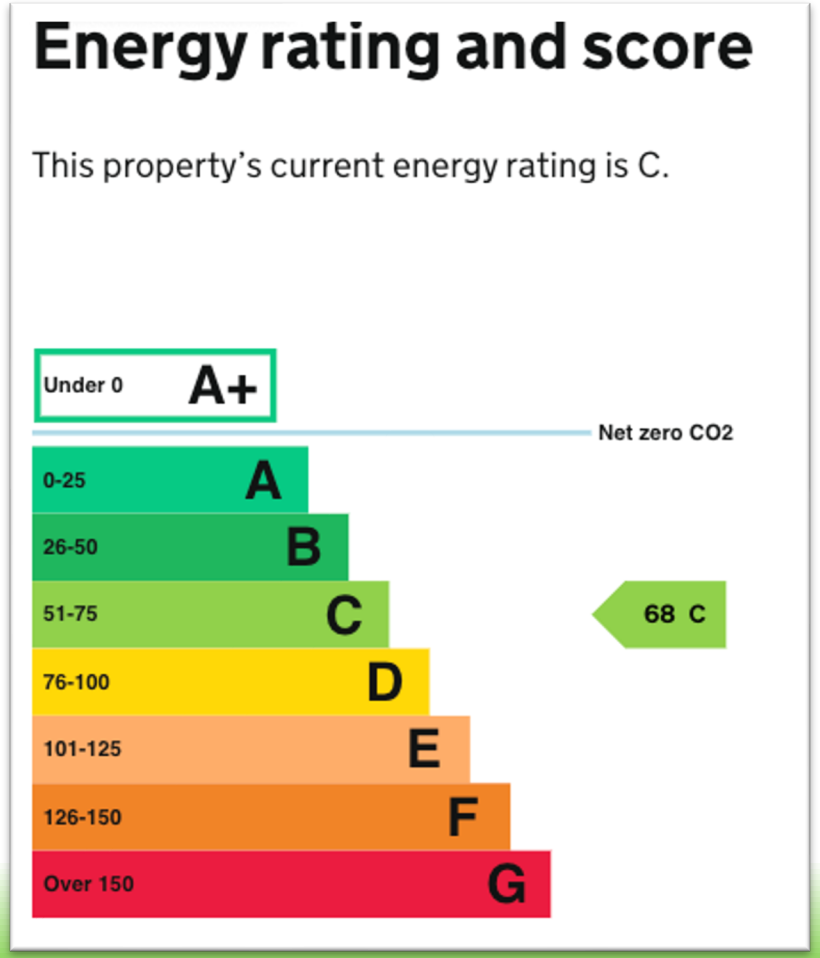
seesustainability.co.uk

Practice energy

- Gas/oil for heating
- Electricity for equipment +/- heating

- Measured in kWh (kilo Watt hours)
- Compared by kWh/m2 floorspace

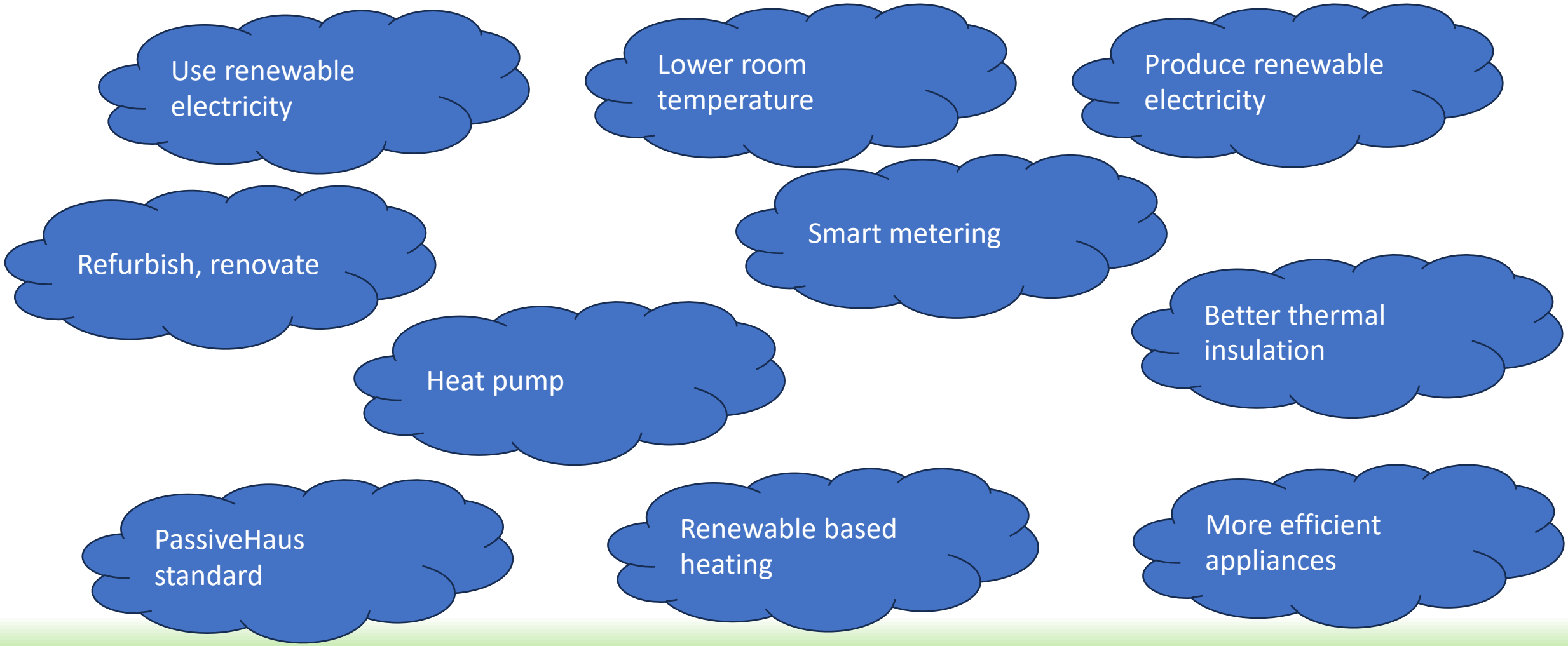
- Assessed by Energy Performance Certificate



Energy and estates - Policy context

- NHS and Net Zero - Health and Care Act 2022
  - www.england.nhs.uk/greenernhs/a-net-zero-nhs
- NHS Net Zero Building Standard
  - www.england.nhs.uk/publication/nhs-net-zero-building-standard/
- Delivering a ‘Net Zero’ National Health Service
  - www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2020/10/delivering-a-net-zero-national-health-service.pdf
- Estate ‘Net Zero’ Carbon Delivery Plan
  - www.jpaget.nhs.uk/media/588250/Estates-Net-Zero-Carbon-Delivery-Plan.pdf

What are the best actions to take?



Take action – An NHS overview

Four step approach to decarbonise the NHS estate by 2040

STEP 1: Make every kWh count
STEP 2: Prepare buildings for electricity-led heating
STEP 3: Switch to non-fossil fuel heating
STEP 4: Increase on-site renewables

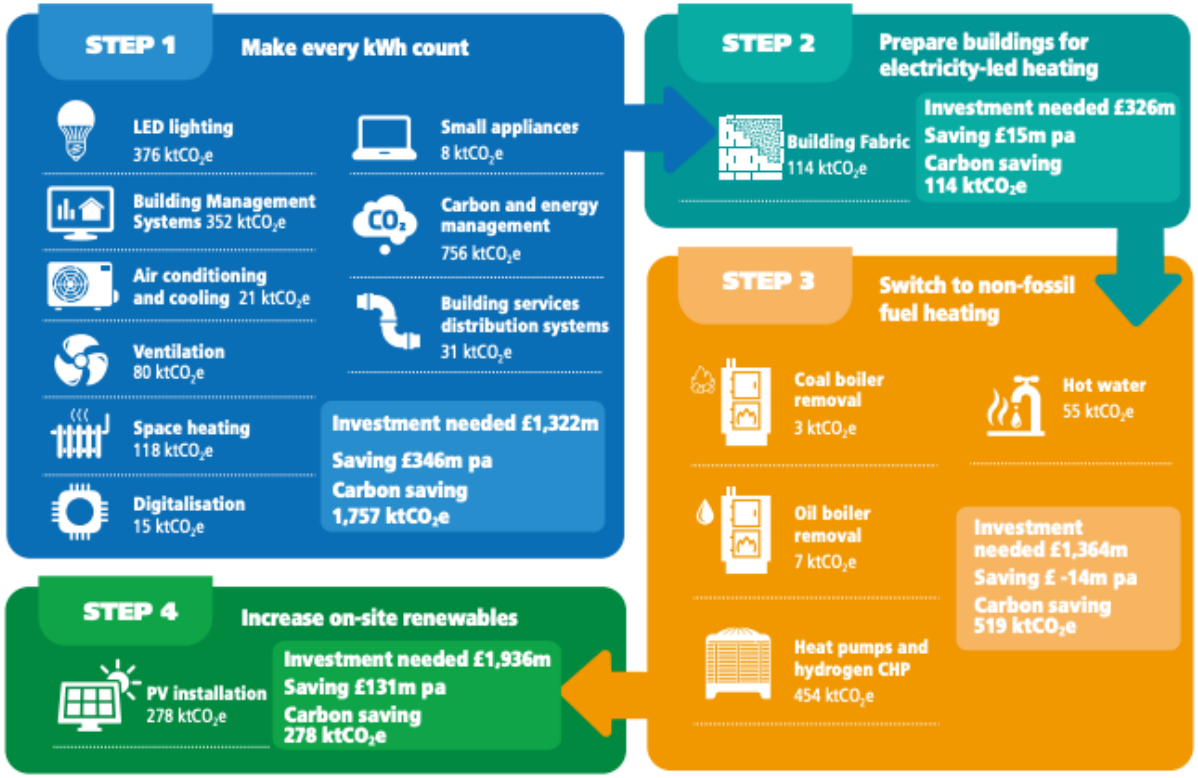
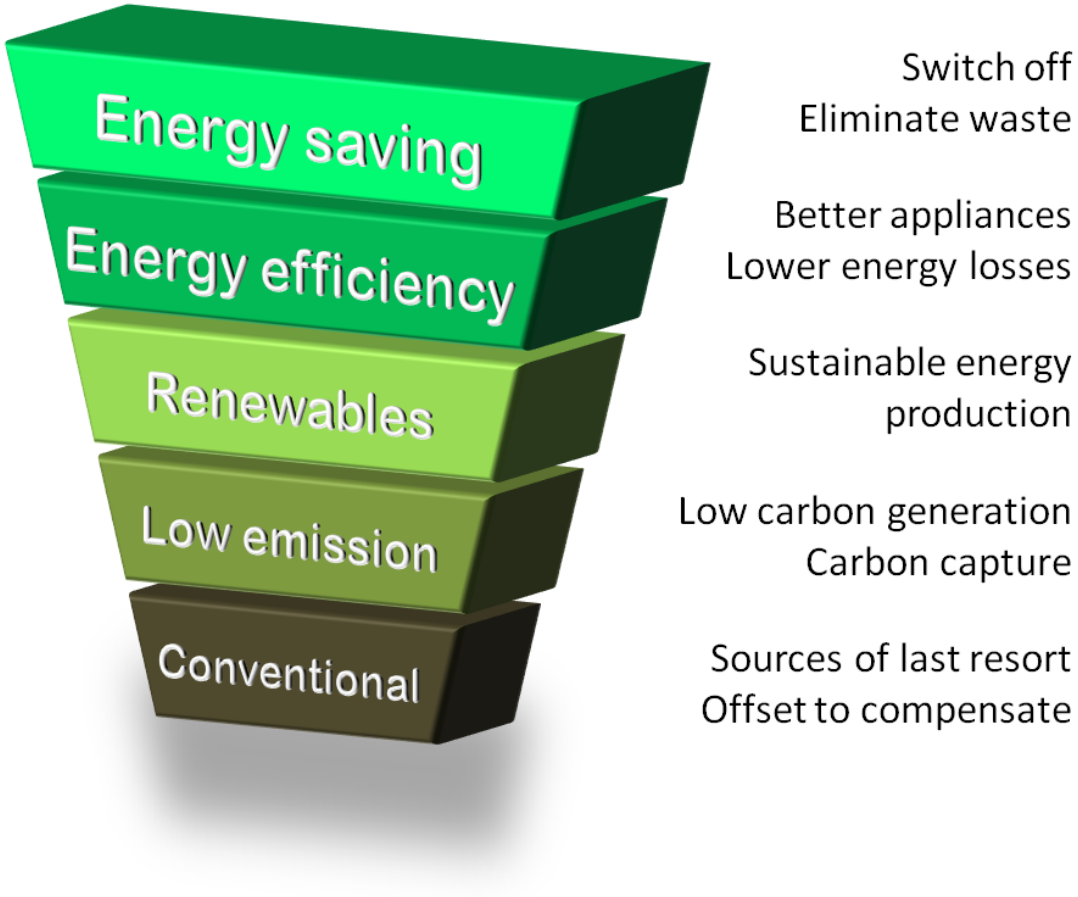


Figure 1 includes indicative numbers to illustrate the scale of the challenge to decarbonise the NHS estate by 2040. These are not actuals.

Ref Estates 'Net Zero' Carbon Delivery Plan

How to approach taking action?



Priority 1 *Leaner* - Use less energy with behaviour change

Priority 2 *Leaner* - Using less energy through technology

Priority 3 *Keener* - Use energy efficiently

Priority 4 *Greener* - Supply electricity efficiently - self generated

Priority 5 *Greener* - Supply electricity efficiently - purchased from the grid/energy company

Priority 6 *Cleaner* - The continued use of (non-sustainable resources) fossil fuels as part of the energy mix but using lower carbon technologies with less emissions

Priority 7 *Meaner* - Business as usual approach, using fossil fuels as they are now

Heating energy

		Percentage reduction in energy use for heating through building fabric efficiency		
	Energy use (kWh/m2/y)	2009 building reg (domestic)	Retrofit trials (domestic)	Passivhaus standard energy use (Retrofit)
Average (median) heating energy use (kWh/m2)[15]	190	63.2	78.9	86.8
2009 building reg (domestic)	70	-	42.9	64.3
Retrofit trials (domestic)	40		-	37.5
Passivhaus standard space heating demand - Retrofit (kWh/m2)	25			-
Passivhaus standard space heating demand - Newbuild (kWh/m2)	15			-

What uses most electricity in a practice?

What type of equipment?

- Heating
- Cooling

Collecting data

How much equipment?

Number of computers, monitors, printers, lights etc

How long is it used for?

10mins or 24hrs per day?

A detailed energy audit involves listing all the items of equipment within the practice, their energy rating, number of hours used. Add additional equipment as needed.

Office	Number	Energy rating on appliance in Watts (W)	Energy rating (kWh)	Number of hours used per day	Total energy used per day B*D*E	Energy use (kWh) per year (*252 working days)
(e.g Monitors)	50	8kWh/1000 hours = 8/1000 = kWh	0.008	10	4	1008
Printer (business model)	2	675	0.675	1	1.35	340.2
Printer (stand by)	2	18	0.018	23	0.828	208.656
Photocopier	1	20	0.02	1	0.02	5.04
Fax machine	0	0	0		0	0
Franking machine			0		0	0
Computer	17	165	0.165	8	22.44	5654.88
CCTV system			0		0	0
Monitors	32	12	0.012	8	3.072	774.144
Total						**6982.92**

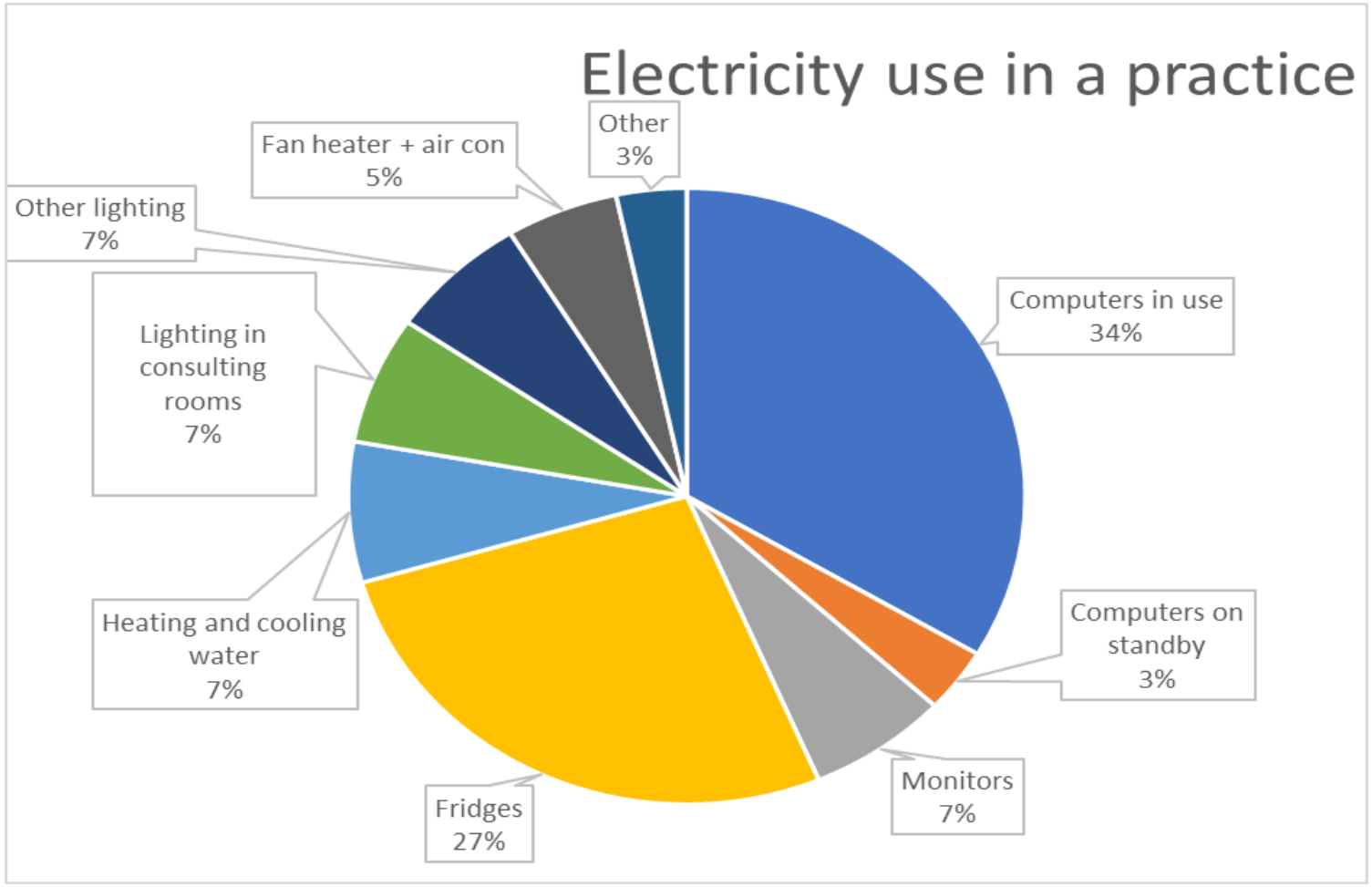
If 50p/kWh
2500 hours = 250 days @10h/day

Bulbs

	GU10 Halogen
Cost to buy	£7.44
Lifespan (hours)	3,000
Power used (W)	70
Convert power to kW (/1000)	0.070
Energy use per 1000 hours (kWh)	0.070*1000 = 70
If £0.50/kWh	70*0.5 = £35
Cost to run 2500 hours (1 year)	£87.50
If practice uses 50 bulbs	£4,375

	GU10 2.4W
Cost to buy	£1.65
Lifespan (hours)	25,000
Power used (W)	2.4
Convert power to kW (/1000)	0.0024
Energy use per 1000 hours (kWh)	0.0024*1000 = 2.4
If £0.50/kWh	2.4*0.5= £1.20
Cost to run 2500 hours (1 year)	£3
If practice uses 50 bulbs	£150

What uses most energy in a practice?



What are the most impactful actions to take?

1. Use renewable electricity
2. Refurbish, renovate
3. Heat pump
4. Renewable based heating
5. PassivHaus standard buildings
6. Produce renewable electricity
7. Better thermal insulation
8. Smart metering
9. Lower room temperature
10. More efficient appliances

Even if you don't do anything else…

Taken from Ivanova et al https://iopscience.iop.org/article/10.1088/1748-9326/ab8589/pdf

Energy actions today

1. Change energy supplier
    - 100% renewable
2. Simple energy audit
    - Identify which equipment are highest users
3. Identify behaviour changes across the team
    - Reduce energy use
4. Procurement policy
    - Most energy efficient equipment
5. Prepare for future needs
    - e.g. electricity led heating

What will you pledge to do?

Top things optical practices can learn from across primary care

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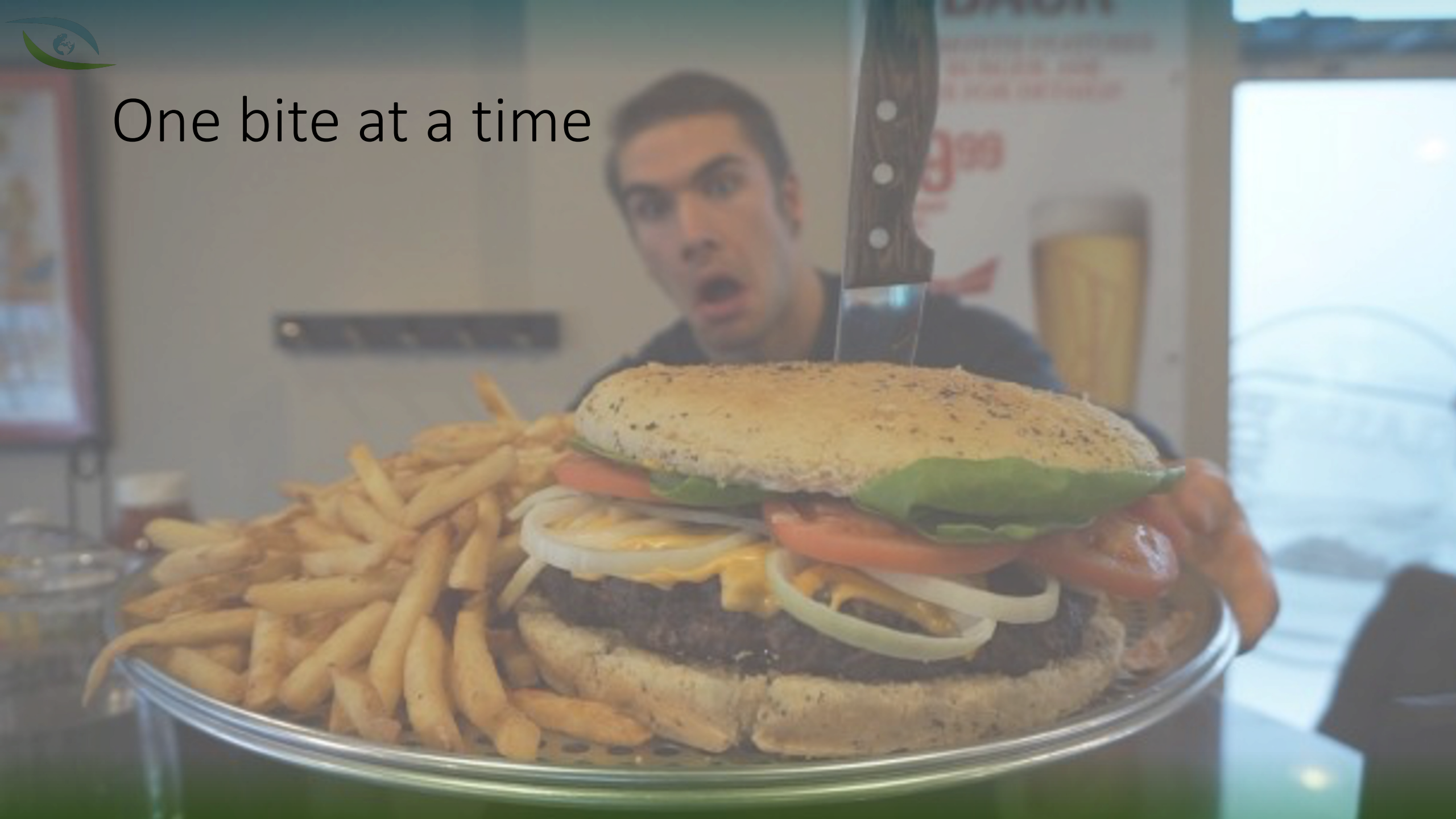
How do you eat an elephant*?

*eating elephants is NOT advocated...

One bite at a time



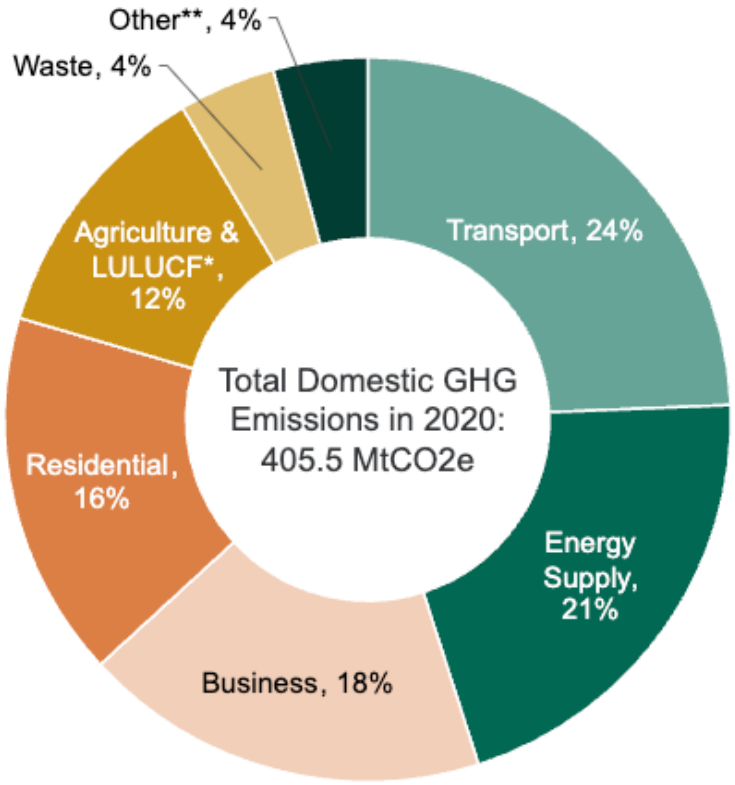
Identify major emission hotspots

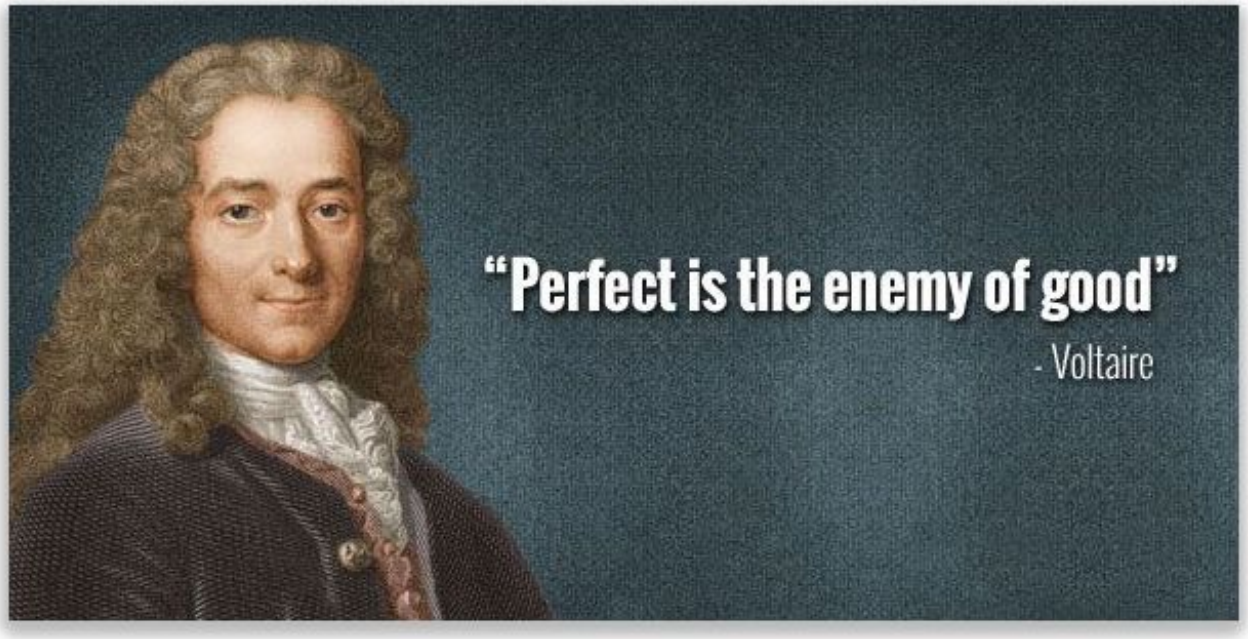
Know your hotspots

- Energy/estates
- Travel/transport
- Goods/services/procurement
- Clinical

Gather data

Figure 3: Greenhouse gas emissions by sector, 2020, by proportion (BEIS, 2022)




“Perfect is the enemy of good”
- Voltaire


And now that you don't have to be perfect,
you can be good.
-John Steinbeck

‘No regret’ action

Reduce energy use

Savings from Properly Turning Off

Action

We decided to get everyone to turn off at the wall after their sessions and a negotiated electrical responsibility plan was rolled out across the practice. GP and nurses’ rooms were completely shut down at the wall at the end of each day.

Results

The meter readings show that our consumption has reduced by **37%** October 2021 compared with October 2020

Conclusion

Modest behavioural changes from our electrical equipment responsibility plan have reduced our electricity consumption and saved about £1000

‘No regret’ action

Transport and lift sharing

Benefits of staff lift sharing

Action
Staff home postcodes were plotted on a map, and 4 lived within a couple of streets of each other. All drove separately. When asked, they wishes to share lifts but couldn’t due to shift patterns and start/finish times differing .

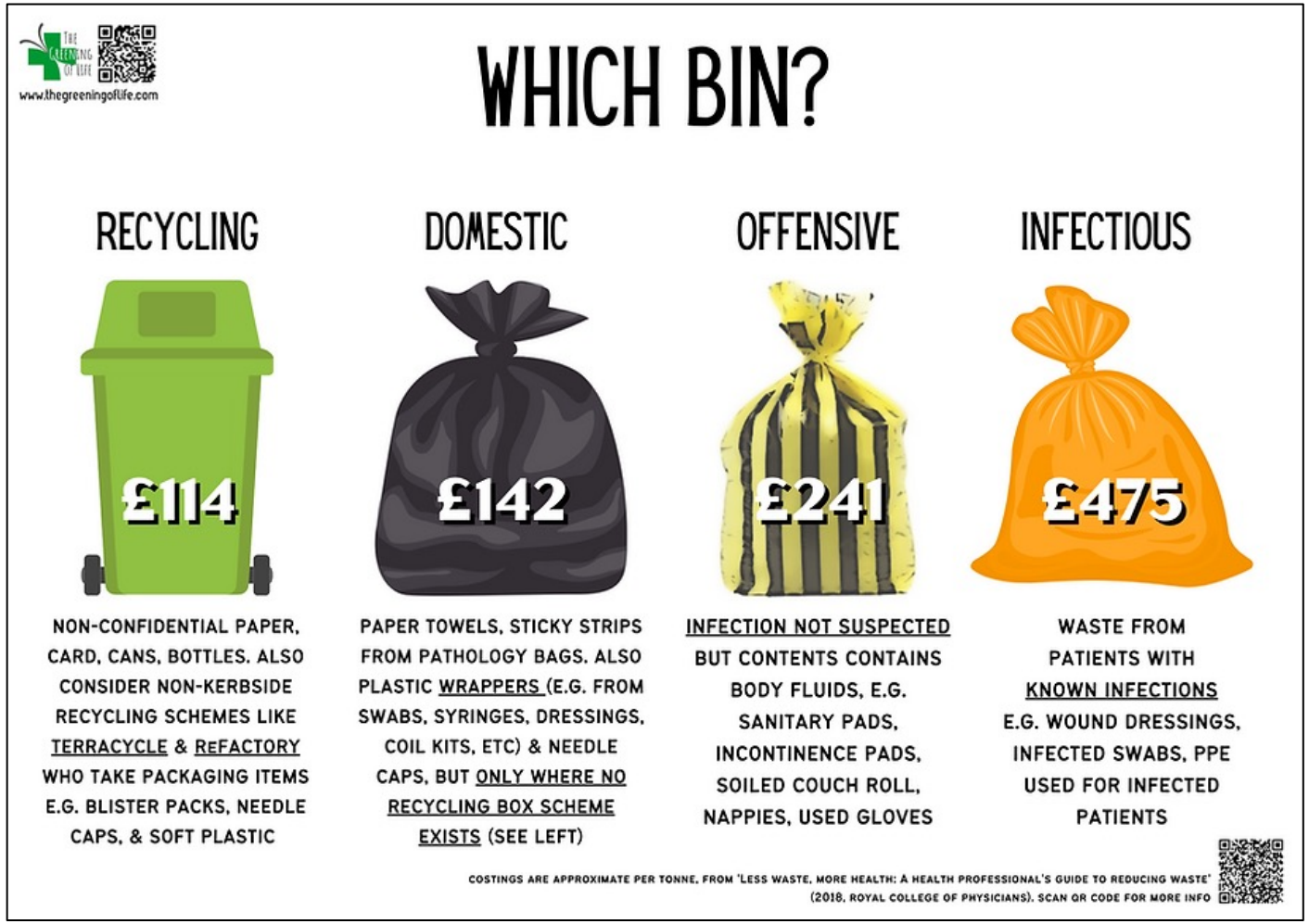
Results
Staff had their shift times coordinated to start and finish at the same time. They started lift sharing

Conclusion
Four staff started sharing and saved themselves money (quarter of the money spent on petrol), reduced air pollution (reduced cars on the road by 75%), improved staff morale (saw each other more)

‘No regret’ action

Procurement

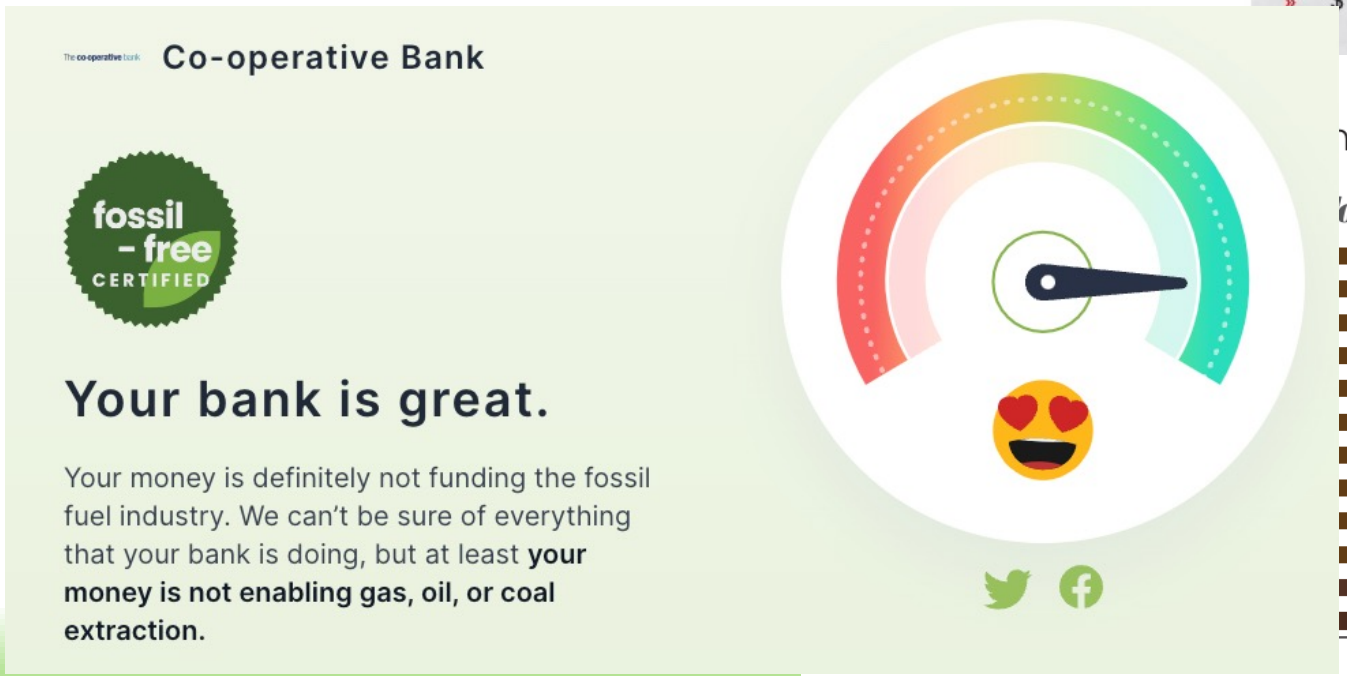
Waste segregation

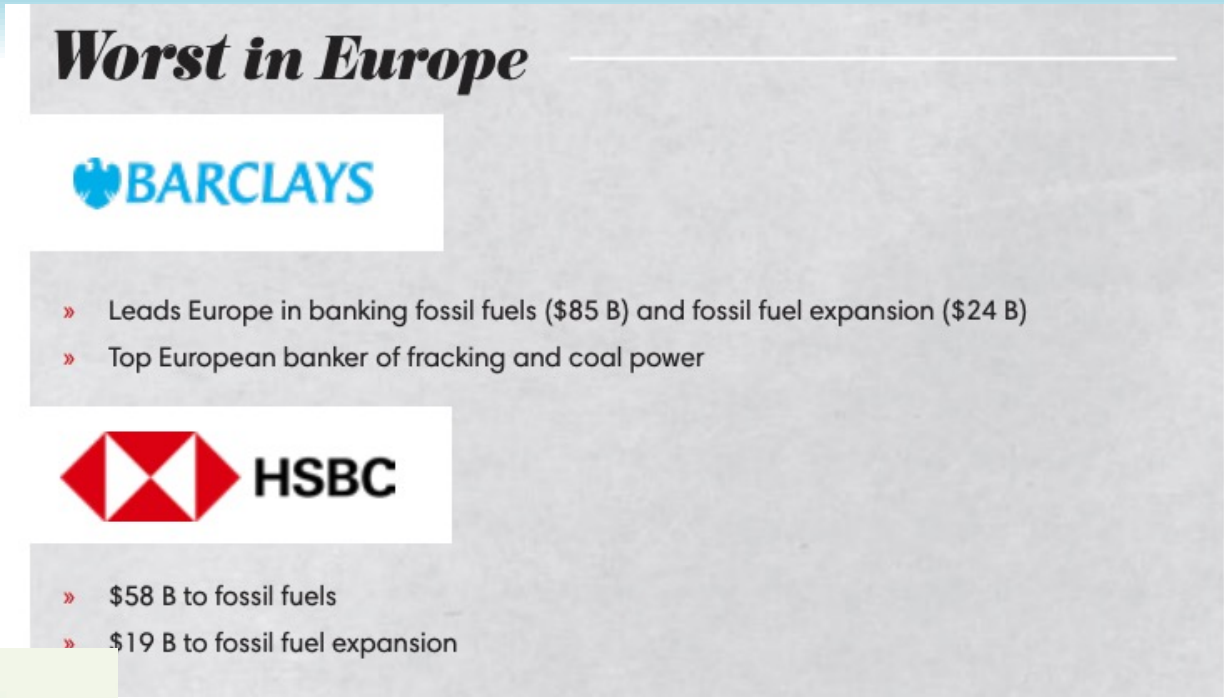


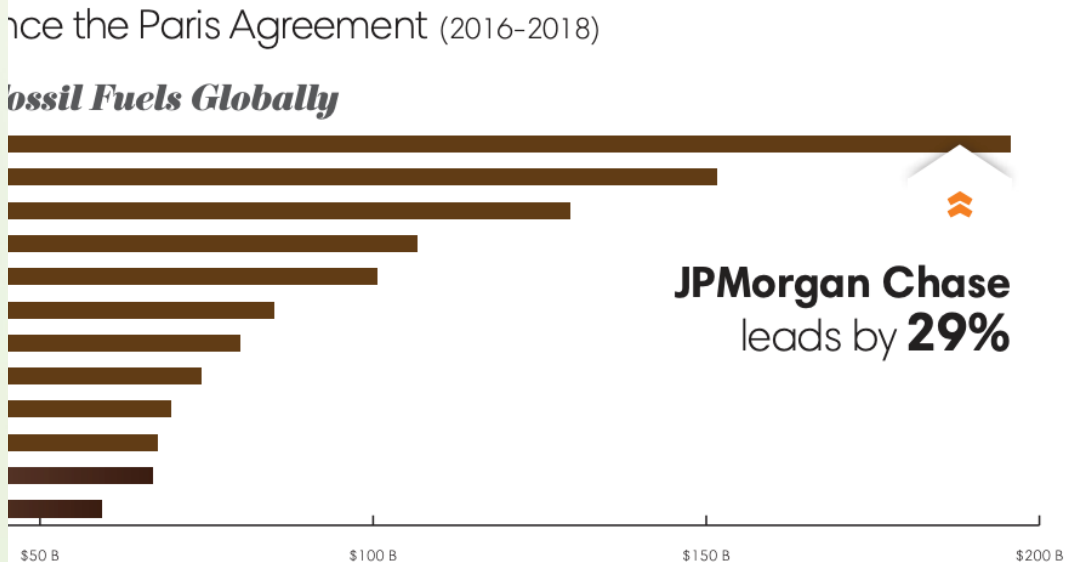
‘No regret’ action

Change banks

https://bank.green/







‘No regret’ action

Talking to others

Making pledges

“I talked at my practice about climate issues and what we could do to make a difference

Probably most satisfying thing to happen, and potentially priceless in terms of effects is the PM has started cycling the 1 mile into work.”

Assemble your team

Green team

Green network

Green community

Green coordinator

NOT Green champion

Top actions

Many small action – but don’t stop!

Plan for tomorrow but act today

Talk about what and why

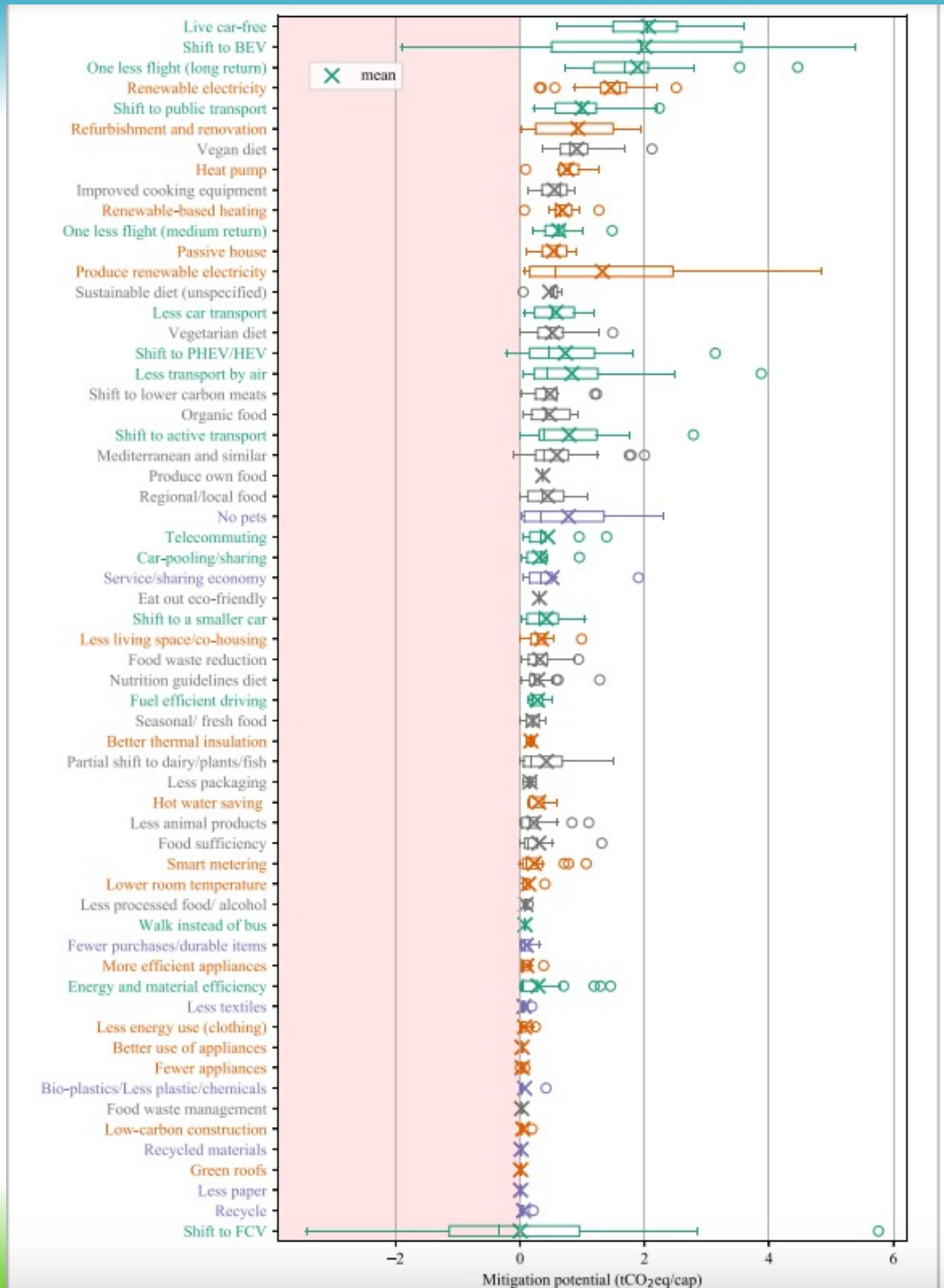
Get staff on board and involve patients

Calculate your baseline impact

Change bank and energy supplier

Take an action… and don’t stop

- Live car free
- Shift to BEV
- One less flight
- Use renewable electricity
- Shift to public transport
- Vegan diet
- Vegetarian diet
- Less car transport
- Shift to active transport
- Organic food



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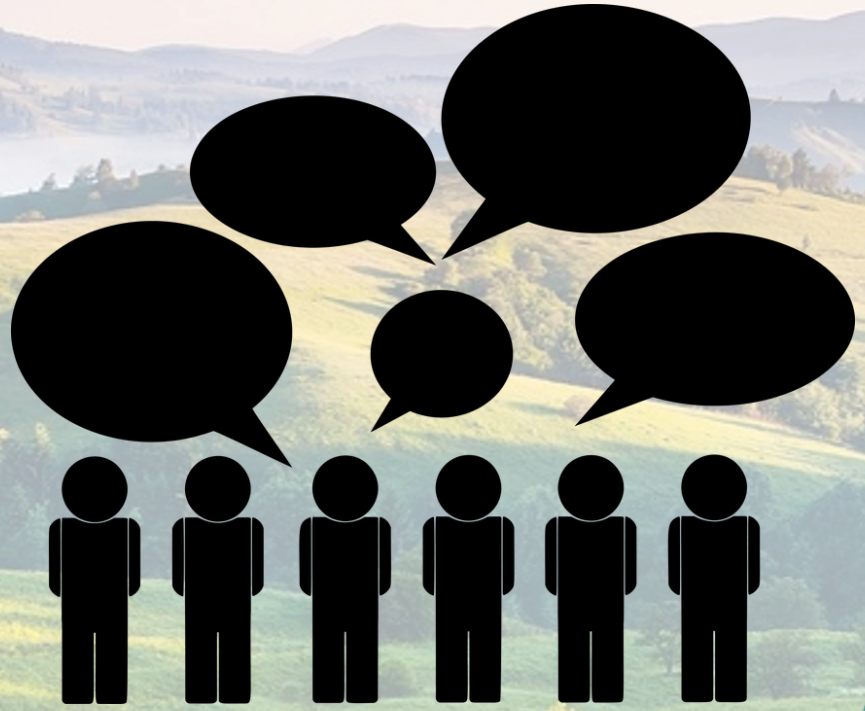
Top 3 changes as an individual and a profession

Make a public pledge – and tell others



Talk about climate change

Find and join your tribe

Thank you!

seesustainability.co.uk

matt@seesustainability.co.uk