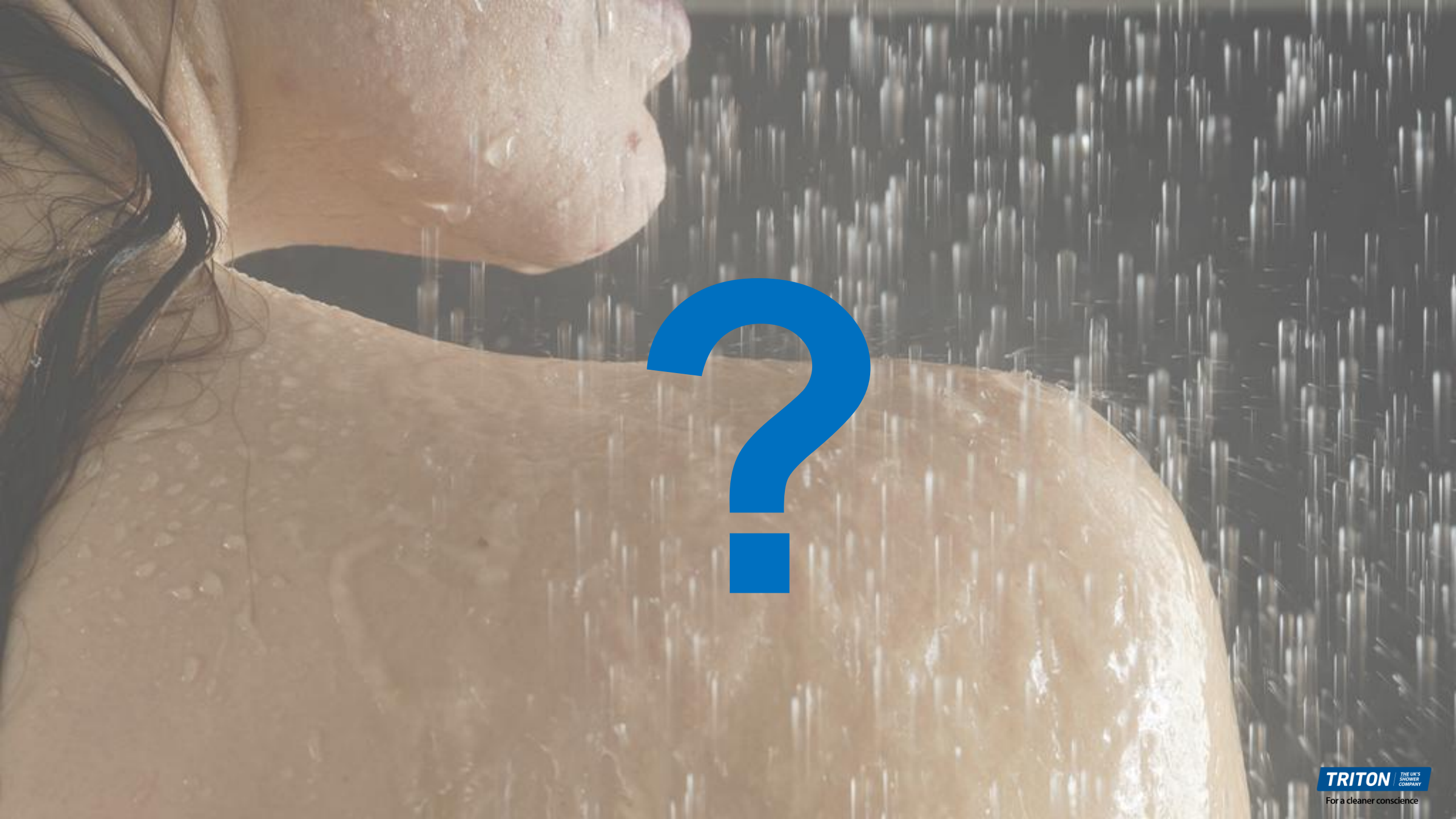
A modern bathroom with marble walls, a glass shower enclosure, a white sink, and a toilet. The text is overlaid on the image.

Conscious showering;

Understanding the cost and carbon impact of different showering solutions

Housing Scotland – 29th Nov 2023



Cost-of-living crisis v Climate crisis



V



About me

Industrial Designer (BSc)

25+ years **design development** experience

5 years at Triton (initially NPD)

Long-standing **passion for Sustainability**





Proud to be a
Biffa's manufacturer

UK Manufacturer

From a garage in Atherstone in 1975, to a company of over 300 staff, we manufacture and supply showers and showering-related products to the whole of the UK, Eire, plus a growing number of other markets around the world



PlanetMark
Certified Business

Carbon Neutral



Our mission

**“Inspiring everyone to
shower sustainably,
because every drop makes
a difference”**

Our Net Zero commitment

Net Zero: 2035

(Near-term target: 2028)



The 2 key parts to a shower's footprint

EMBODIED (<5%)



The GHG emissions associated with the **manufacturing, transportation, installation, maintenance, and disposal** of a product

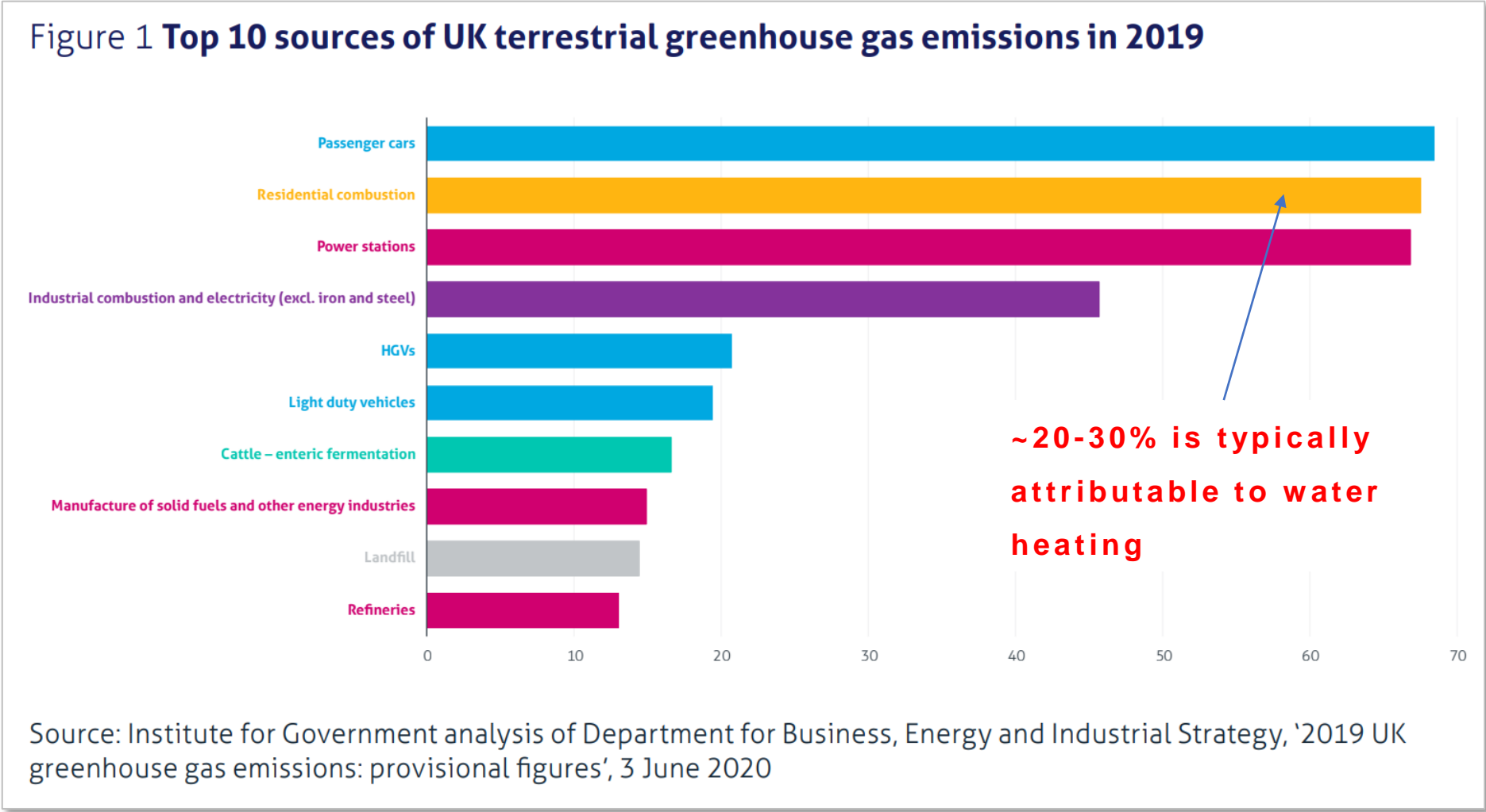
OPERATIONAL (>95%)



The GHG emissions associated with the **'use-phase'** of a product
(for the full anticipated life-span of the product)

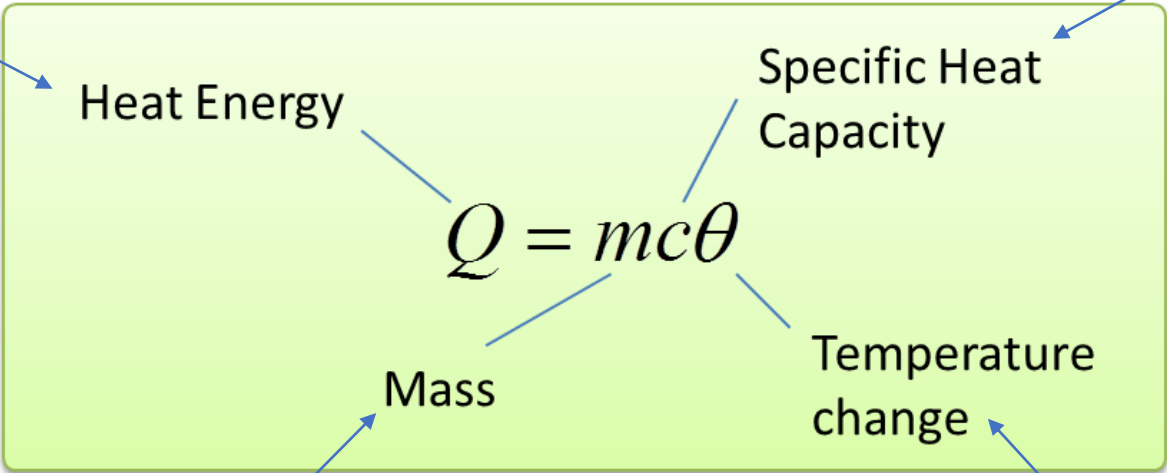
The role of domestic hot water

Current focus is on space heating as the #1 source of household emissions (but water heating is #2...)



Why is water heating such a big deal...?

Energy required



Substance		C _p in J/g°C	C _p in cal/g°C	Relative heat capacity
Bismuth	Bi	0.123	0.029	
Gold	Au	0.126	0.030	
Lead	Pb	0.128	0.031	
Tungsten	W	0.134	0.032	
Mercury	Hg	0.140	0.033	
Silver	Ag	0.233	0.056	
Brass		0.380	0.091	
Copper	Cu	0.386	0.092	
Zinc	Zn	0.387	0.092	
Granite		0.790	0.189	
Glass	SiO ₂	0.840	0.201	
Aluminium	Al	0.900	0.215	
Ice (-10°C)	H ₂ O _(s)	2.050	0.490	
Ethyl alcohol	C ₂ H ₅ OH	2.400	0.574	
Water	H ₂ O _(l)	4.186	1.000	

Heating water is **VERY** energy intensive!

Shower flow rate (l/min) x duration

T_{Shower} - T_{Cold water supply}

HOW MUCH water we heat matters

WHERE that energy comes from matters

Helping customers understand their showering habits

People in your household
(using a shower)

—

4

+

Showers per week
(per person)

—

7

+

Showering length
(per person)

6 mins

8 mins
(UK Average)

10 mins

12 mins

14mins

Showers type

Electric

Mixer

Digital

TRITON

THE UK'S SHOWER COMPANY

Energy & Water Savings Calculator

Usage

Your current estimated annual usage

£

£471.46

Total cost

£

£145.29

Annual water cost

£

£326.17

Annual energy cost

109,380 bottles

500ml bottles of water

682 4.7kg

loads of washing dried in tumble dryer

1,793 miles

in a mid-sized family car

Estimated annual savings for
showering 1 min less

£

£53.10

Total saving *estimated annual saving

£

£15.57

Annual water saving

£

£37.52

Annual energy saving

13,673 bottles

500ml bottles of water

85 4.7kg loads

loads of washing dried in tumble dryer

224 miles

in a mid-sized family car

Reset all

bma

Bathroom Manufacturers Association

WINNER OF THE BEHAVIOUR CHANGE AWARD

BMA SUSTAINABILITY AWARDS 2022





Based on the national average electricity usage and a 8.5kw shower at 38°

Detailed mathematical modelling of different showering ‘Eco-systems’ (schematic)

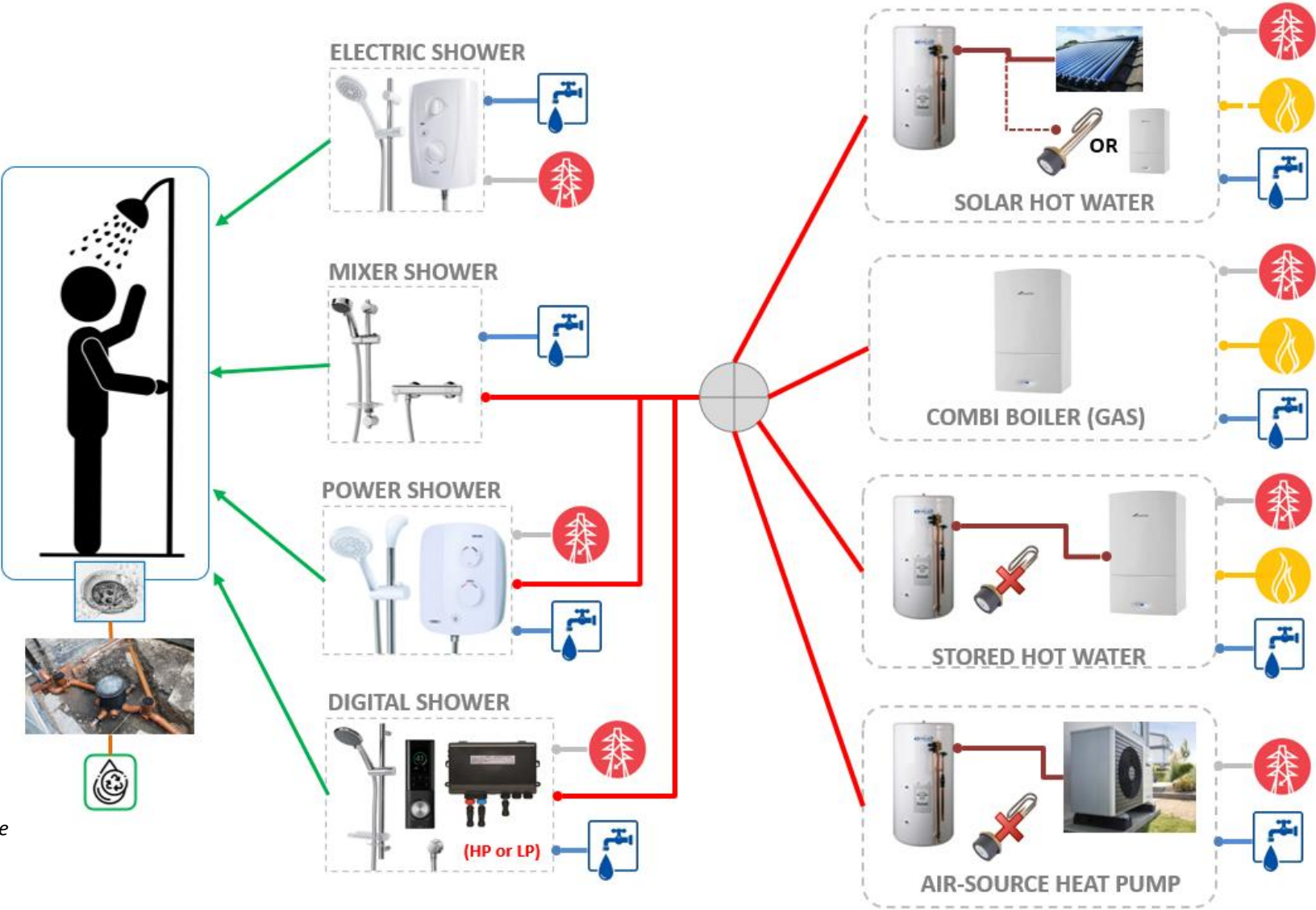
DUTY CYCLE VARIABLES

- # Showers per person, per week
- Shower duration (average)
- Showering temperature (average)
- Temperature of cold water supply
- Flow rate

UTILITIES VARIABLES

	<ul style="list-style-type: none">Supply rate (£ per kWh)Standing charge (£ per day)*Carbon footprint (kg CO₂e per kWh, including T&D losses)
	<ul style="list-style-type: none">Supply rate (£ per kWh)Standing charge (£ per day)*Carbon footprint (kg CO₂e per kWh)
	<ul style="list-style-type: none">Supply rate (£ per m³)Standing charge (£ per day)*Carbon footprint (kg CO₂e per m³)
	<ul style="list-style-type: none">Rate (£ per m³)**Standing charge (£ per day)*Carbon footprint (kg CO₂e per m³)

* Pro-rata standing charges as an estimated % of utility usage attributable to showering versus total household usage
** This is assumed to be = water supply



Functional unit: 1 year's showering

Illustrative comparison of 3 different showering ‘eco-systems’

3-person household, 5 showers pppw, 7.5 min average duration @ 41°C



(A-Rated Combi)



(ASHP, COP 3.5)

Cost	Water	Carbon
£407.99 (un-metered)	20,451 litres	224.11 kg CO ₂ e
£422.31 (metered)		

Cost	Water	Carbon
£438.09 (un-metered)	71,049 litres	797.86 kg CO ₂ e
£648.74 (metered)		

Cost	Water	Carbon
£417.97 (un-metered)	71,049 litres	234.12 kg CO ₂ e
£628.62 (metered)		

Functional unit: 1 year’s showering

Assumptions: >1st Jan 2024 energy price cap, Scottish Water charges 2023-24

Flow

If **10%** of Scottish households reduce the **flow rate** from their Mixer shower (connected to an A-rated gas boiler) **by 3 l/min**



~1,255 Olympic pools
~3.1Bn litres



~£11.8M (un-metered)
~£24M (metered)



~20k ICE cars off UK roads
~35.2k tCO₂e

Behaviour

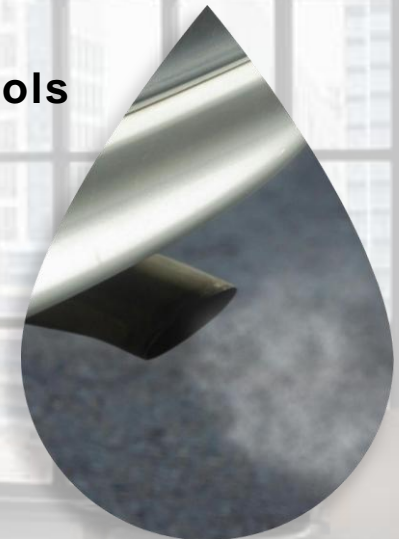
If **10%** households in Scotland reduce the **average shower time** with their Mixer shower (12l/min, connected to an A-rated gas boiler) **by 2 minutes**



~1,339 Olympic pools
~3.3Bn litres



~£12.6M (un-metered)
~£25.6M (metered)



~22k ICE cars off UK roads
~37.6k tCO₂e

Energy source

If **10%** of households in Scotland fitted and used an **8.5kW Electric shower*** rather than a **Mixer** (12 l/min flow rate assumed) connected to an **A-rated gas boiler**

***Note:** a mixer shower fed by an appropriately specified ASHP (if used appropriately) could achieve similar carbon savings



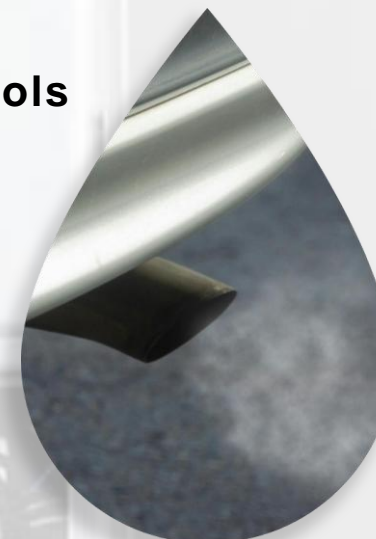
~3,620 Olympic pools

~9Bn litres



~£4.4M (un-

~£39.5M (metered)



~60k ICE cars off UK roads

~102.5k tCO₂e

Conclusion – key take-aways

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Conclusion – key take-aways

- Don't overlook showering in your Net Zero plans
- Consider showering options as part of 'whole-house' heating eco-system design
- Where-ever possible, adopt 'Fabric first' approach
- Engage residents, but don't just rely on behavior change
- For a Net Zero future, energy source **REALLY** matters



Thank you for your attention



Get in touch



Energy savings calculator

“The most reliable way to predict the future is to create it”

Abraham Lincoln

#everydropmakesadifference