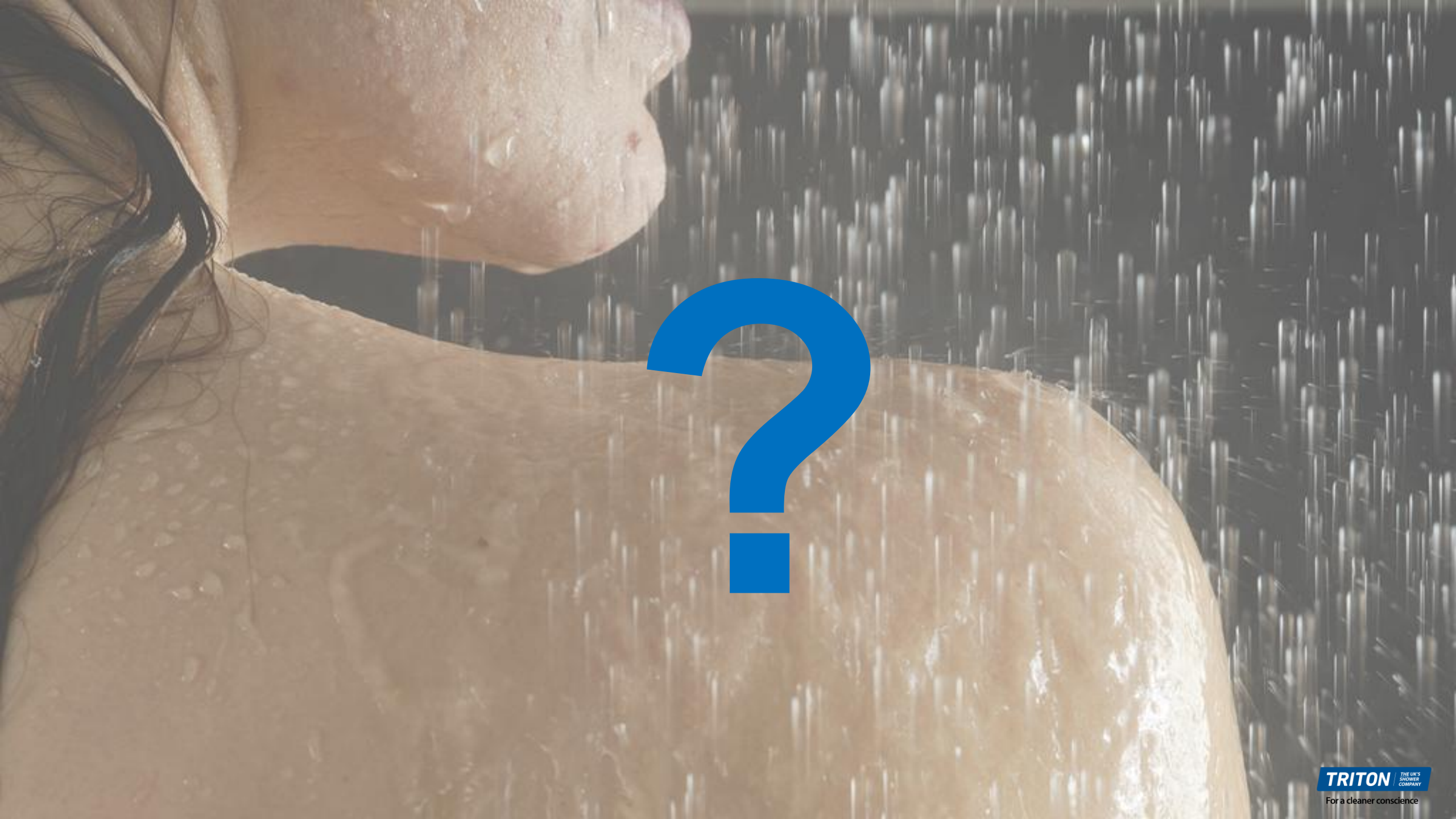
A modern bathroom with a shower, sink, and toilet. The background is a light-colored wall with a marble pattern. On the left, there is a white sink on a grey countertop. In the center, there is a glass shower enclosure with a showerhead. On the right, there is a white toilet and a small table with a basket of toiletries.

Conscious showering;

Understanding the cost and carbon impact of different showering solutions

Housing Link NW – 6th Feb 2024



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**





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 purpose

**“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 (typically 5-10%)



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

OPERATIONAL (typically 90-95%)

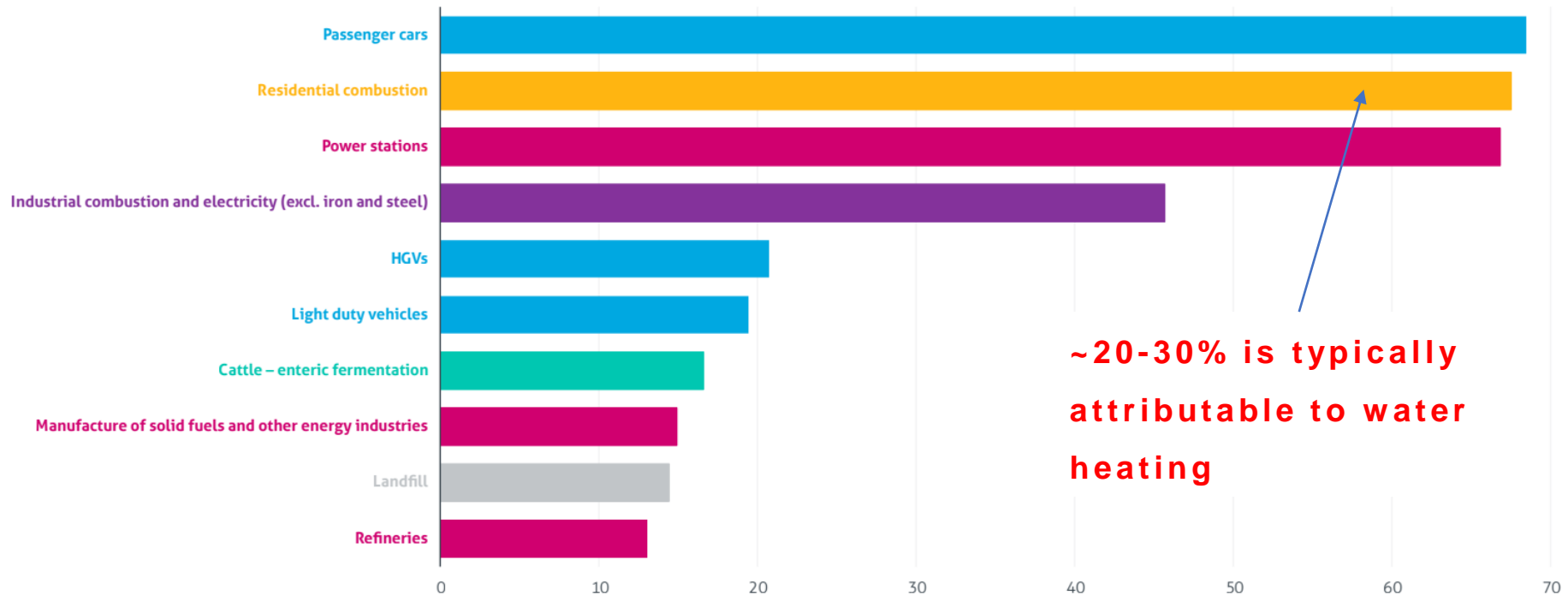


The GHG emissions associated with the **'use-phase'** of a product
(for the full anticipated life-span of the product)

The role of domestic hot water

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

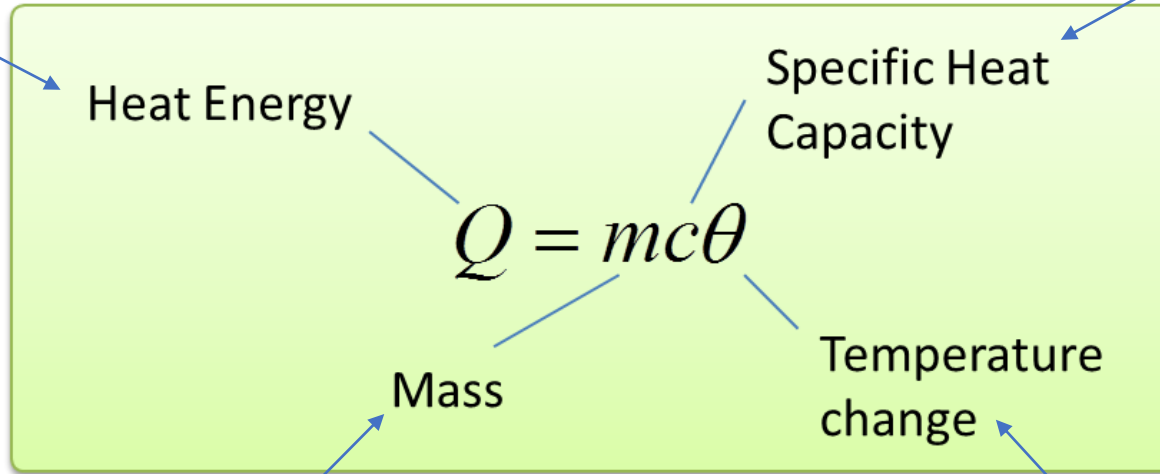
Figure 1 **Top 10 sources of UK terrestrial greenhouse gas emissions in 2019**



Source: Institute for Government analysis of Department for Business, Energy and Industrial Strategy, '2019 UK greenhouse gas emissions: provisional figures', 3 June 2020

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	

A bar chart to the right of the table. The y-axis represents relative heat capacity. The bars are green and their heights correspond to the values in the table. Water's bar is the tallest, reaching 1.000. A callout line points to the water bar with the text 'Water has a very high heat capacity'.

Heating water is **VERY** energy intensive!

Shower flow rate (l/min) x duration

$T_{\text{Shower}} - T_{\text{Cold water supply}}$

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 10 mins 12 mins 14mins
(UK Average)

Shower type

Electric Mixer Digital

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



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 of washing dried in tumble dryer
- 224 miles in a mid-sized family car





Reset all

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

DUTY CYCLE VARIABLES

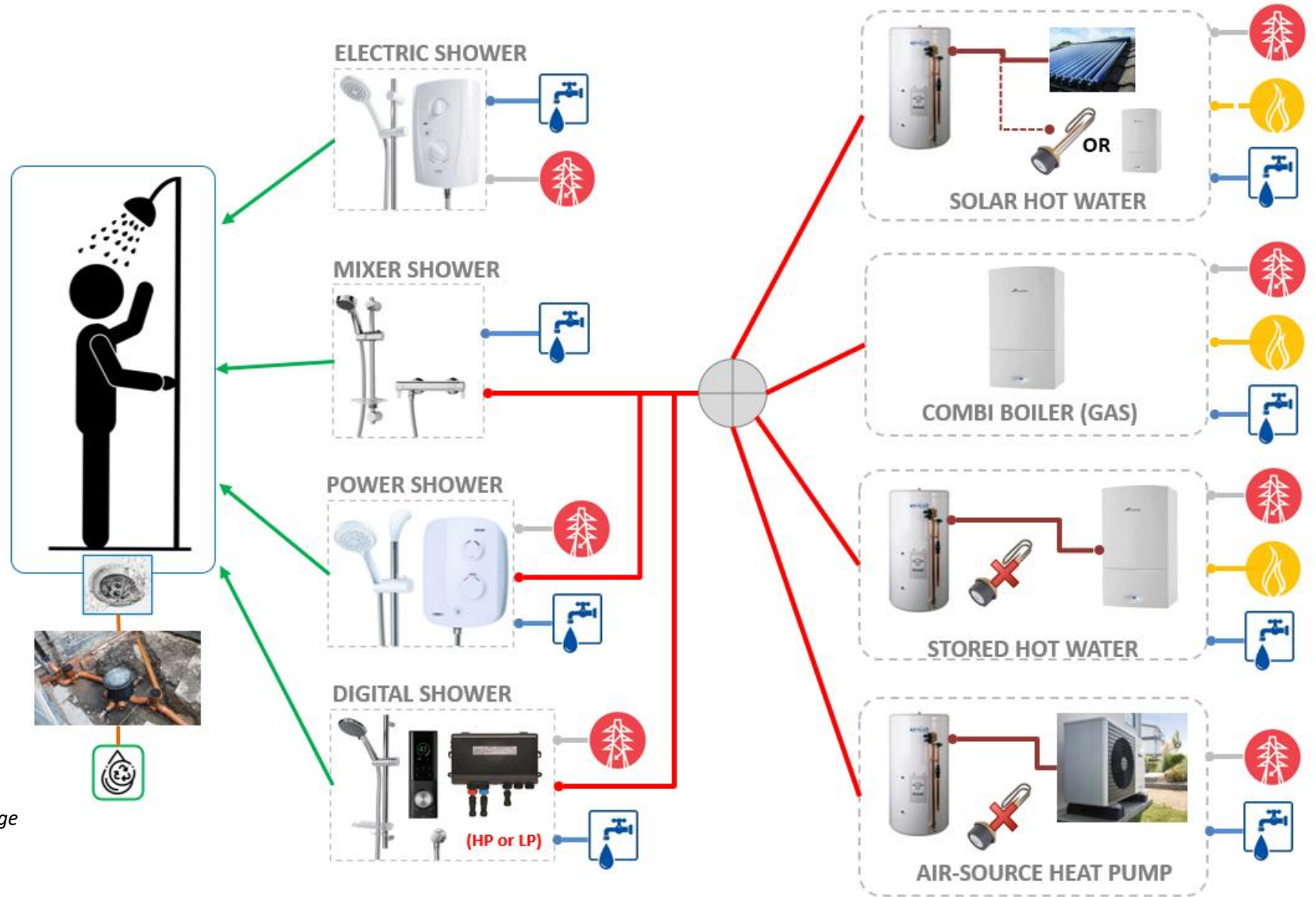
- # Showers per person, per week
- Shower duration (average)
- Showering temperature (average)
- Temperature of cold water supply
- Flow rate

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 (litres)	Carbon (kg CO ₂ e)
£ 336.37	22,566	225

Cost	Water (litres)	Carbon (kg CO ₂ e)
£ 486.37	71,049	726

Cost	Water (litres)	Carbon (kg CO ₂ e)
£ 471.18	71,049	215

Functional unit: 1 year's showering

Assumptions: >1st Jan 2024 energy price cap, Severn Trent Water - Scheme of charges 23/24

Flow

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



~13,704 Olympic pools
~34.3Bn litres!!



~£220M
~£78 per family



~206k ICE cars off UK roads
~350k tCO₂e

Behaviour

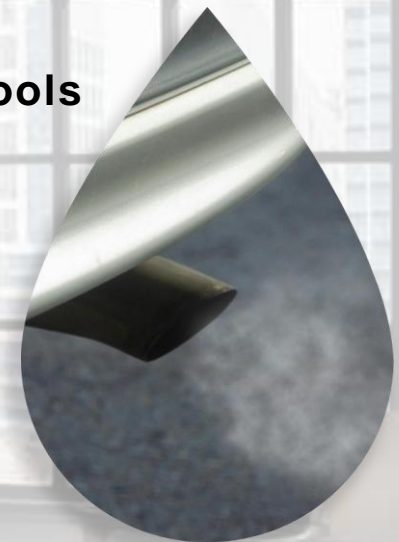
If **10%** of UK households reduce the **average shower time** with their Mixer shower (12l/min, connected to an A-rated gas boiler) **by 2 minutes**



~29,236 Olympic pools
~73Bn litres!!



~£469M
~£83 per family



~439k ICE cars off UK roads
~746k tCO₂e

Energy source

If **10%** of UK households 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



~£282M
~£100 per family



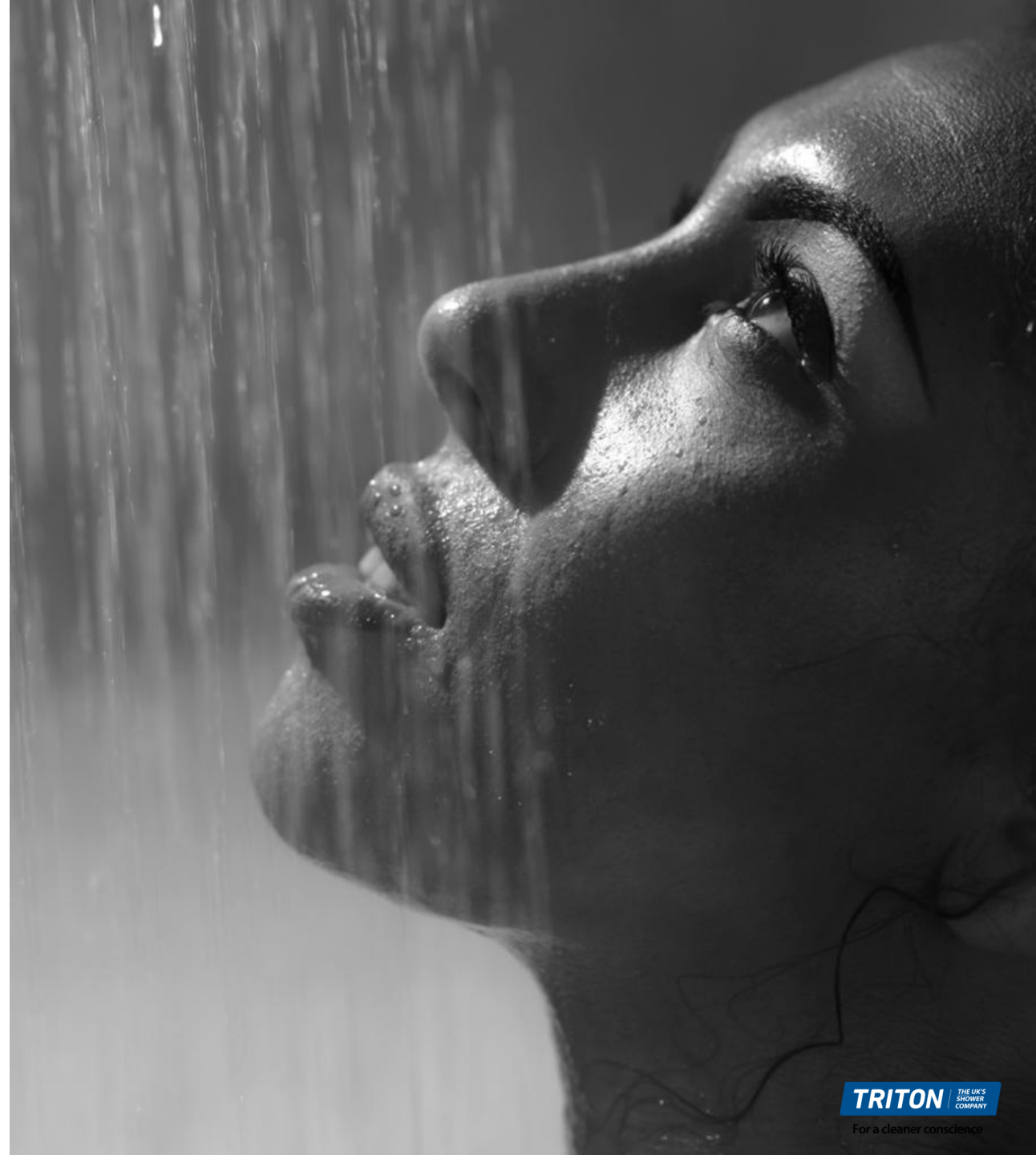
~37,859 Olympic pools
~94.6Bn litres!!



~575k ICE cars off UK roads
~977k tCO₂e

Conclusion – key take-aways

- Don't overlook showering in your Net Zero plans



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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