
Is Rainwater Harvesting a Cost Effective Option for New and Existing Housing Stock?

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Is rwh a cost effective option for new and existing housing stock? – an ech₂o cpd

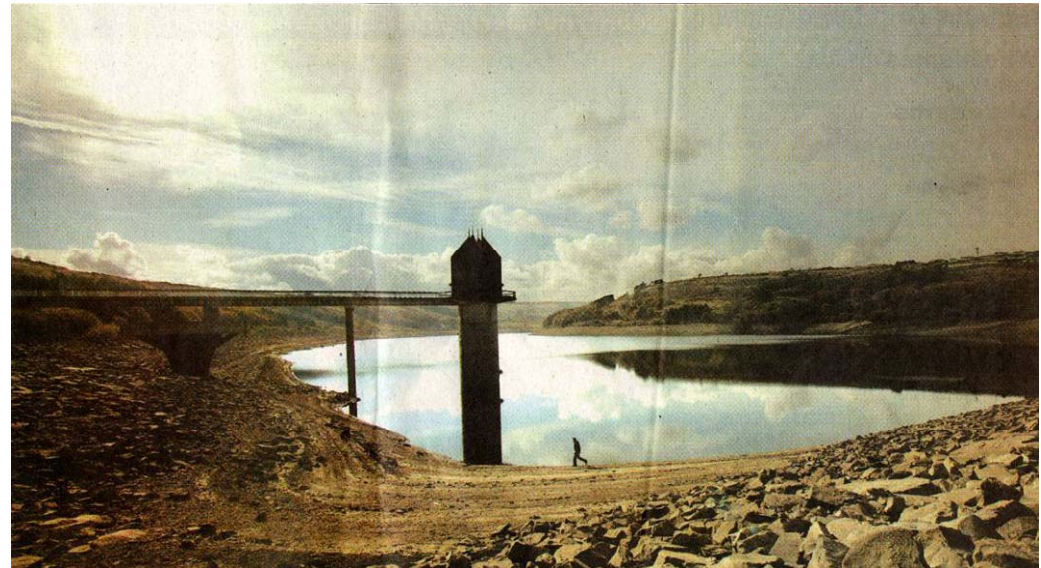
Who are ech₂o and what do we do?

- We are environmental consultants specialising in sustainable water strategies and low carbon or renewable technologies.
- We work in new build or existing buildings.
- We work with occupants of the building to change their behaviour as well as identifying the best technological solutions.
- Our clients include local authorities, housing associations, schools and colleges, water companies, architects, community groups, and householders.

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Rainwater harvesting addresses both localised storm water problems and reduces demand for potable water



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A more relevant question for this conference??

Is Rainwater Harvesting a Carbon Effective Option for New and Existing Housing Stock?

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The carbon load of water

- The carbon load of mains water on average in the UK is 0.35 kgCO₂ (0.6kWh) per m³.
- The carbon load from Beckton desalination plant is 1.1 kg CO₂ per m³ (assuming projected figures of 2kWh per m³).
- The carbon load of mains water supplied and foul water treated is 0.7 kgCO₂ (1.2kWh).
- If the carbon load of pumping the harvested rainwater is greater than 0.3 kgCO₂ you are increasing the carbon load of the water used in the development.



Carbon costs of pumping

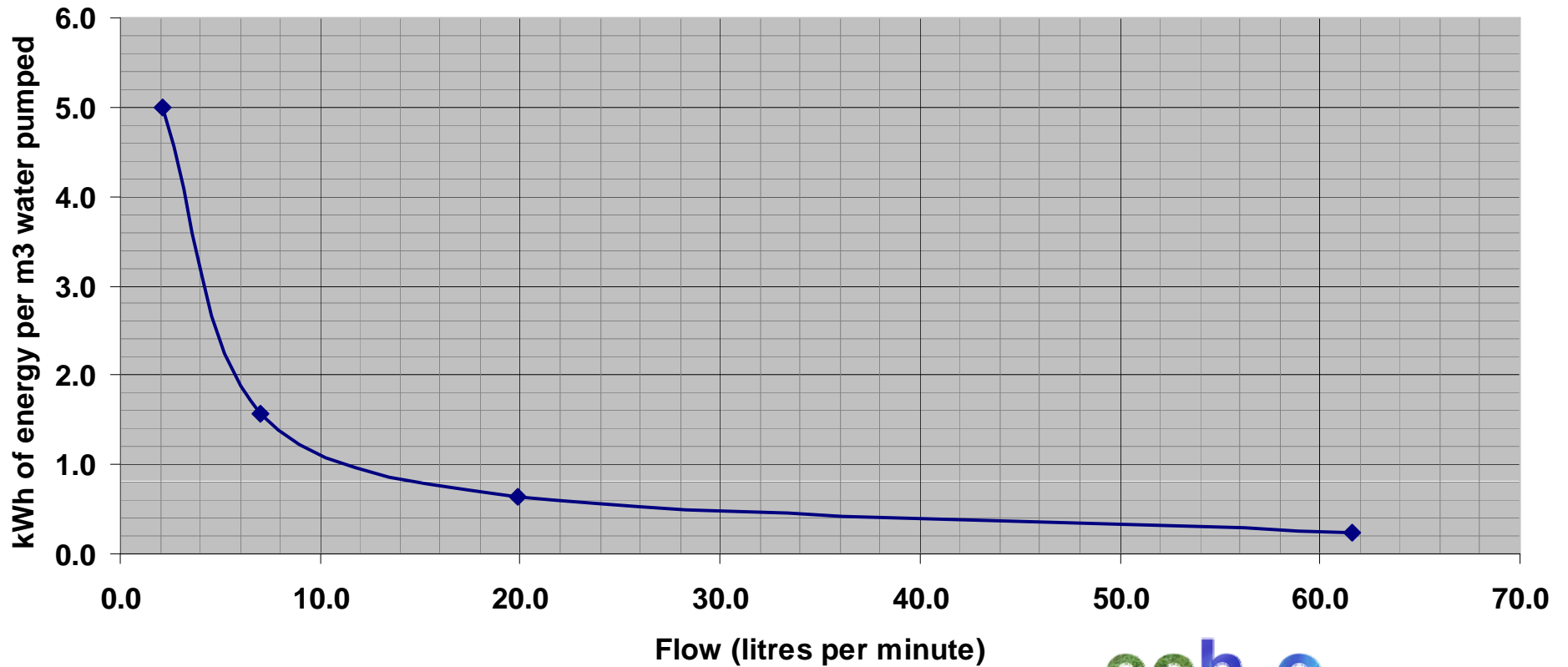
- The pumps in most rainwater harvesting systems are capable of delivering 4 bar pressure at tap and appliance outlets.
- In dwellings the pump can be delivering water at a flow rate of 2 litres/minute to refill a WC cistern. At this flow rate it takes 5kWh to pump 1m³ of rainwater – which results in 8 times more CO₂ emissions than using mains water.
- To match the carbon load of mains water, a flow rate of 20 litres/minute is required.

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RWH systems are more carbon effective at higher flow rates

Energy required to pump 1m³ of rainwater at various flow rates



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How to reduce the carbon load of a domestic rainwater harvesting system

- Pump to a header cistern controlled by float switches and with an unrestricted inlet.
- Specify systems with less powerful pumps.
- Use rainwater outside the dwelling for watering the garden, carwash etc.
- Collecting and storing winter rainfall for use in summer reduces strain on the mains at peak times, should be compulsory in new build in the south and east of the UK and be better rewarded under the Code for Sustainable Homes.

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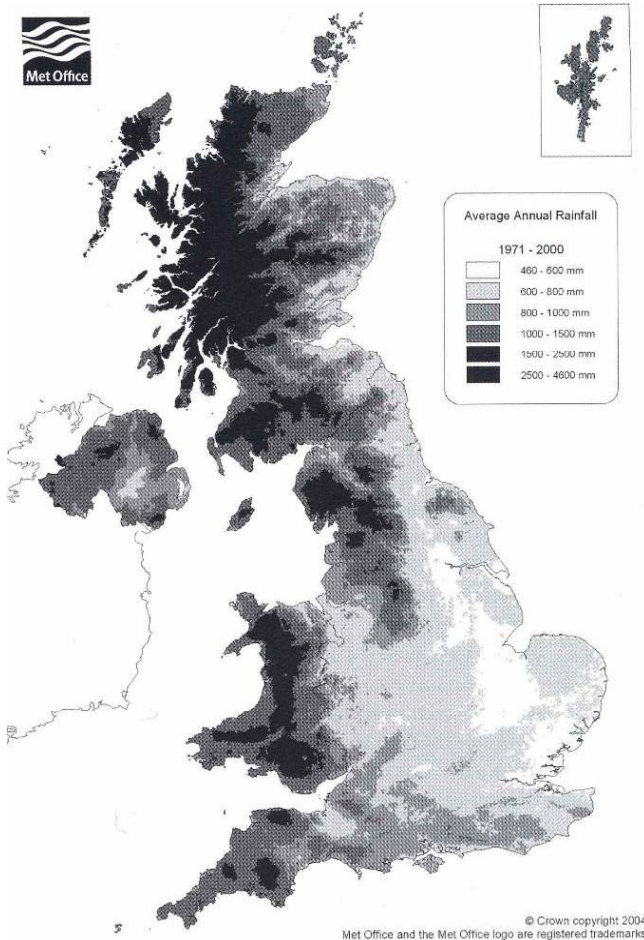
The Code for Sustainable Homes

- For outside use, the Code rewards fitting a rainwater butt at the same rate as installing a 5000 litre tank.
- The Code needs to reflect the fact that using rainwater on the garden is just as valid as using it back in the dwelling.
- The Code needs to reflect the fact that using rainwater on a garden is the most carbon effective solution for dwellings.

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Rainfall in the UK



- Average UK rainfall is 1000 mm/year with a spread of 550 – 4000 mm
- The south and east of the UK receives just 550 – 800 mm/year
- An average 50m² footprint house even in the south east yields 10,000 – 14,000 litres during the autumn and winter months

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Use simple systems outside to make rainwater harvesting systems cost and carbon effective



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ech₂o consultants ltd work with a range of stakeholders to successfully incorporate sustainable water and low carbon solutions into the built environment.



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The South East is Under Water Stress

A glass of beer with a cracked texture on the glass, symbolizing water stress.

Use Water Sparingly

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