

Go With The Flow: Making Rainwater Harvesting Mainstream

Recommendations for breaking the barriers to widespread use of urban RWH systems

By Dr Sarah Ward and Professor David Butler

Rainwater harvesting (RWH) can become a mainstream sustainable water technology capable of meeting some of the challenges posed by rising water demand, flooding and climate change — but only if policymakers take immediate action, an academic study shows.

Research by the University of Exeter's Centre for Water Systems (CWS) has identified cost-effective policy recommendations that could break down some of the social and technical barriers inhibiting development of urban RWH systems in the UK.

Interviews with small and medium enterprises (SMEs) and surveys of householders revealed a clear willingness to adopt the use of RWH.

However, businesses were deterred by a lack of information on how to implement the technology and a limited knowledge of available financial incentives. For householders, the primary concerns were perceived health risks, maintenance and installation costs.

The findings also challenge concerns raised by an Environment Agency (EA) report that the amount of energy consumed by RWH pumping systems dents the technology's green credentials.

Using the University of Exeter's Innovation Centre as a case study, academics devised a more accurate method to calculate the energy consumed by a pump employed in an office building's RWH system.

They found the proportion of the Innovation Centre's electricity consumption attributable to RWH was less than 0.1 per cent. They concluded that new, pump-free RWH solutions that can be easily retrofitted could offset concerns over the energy consumption of domestic RWH systems.

The water saving efficiency of the Innovation Centre's RWH system was 97% during winter and spring, the study revealed.

A quantitative health impact assessment also found that flushing a WC with a RWH system posed less of a danger to health than the possibility of being struck by lightning. Raising public awareness is required to dispel the myth that RWH poses a health risk, it said.

Other findings emphasised the need for policymakers to encourage innovation in the RWH sector: Current policy guides promote RWH

Key findings

- Cost-effective policy changes could overcome the barriers to the widespread adoption of RWH in the UK.
- RWH does not pose significant health risks and requires minimal energy consumption for an office building system.
- New pump-free solutions can offset many concerns about energy consumption for domestic RWH systems.
- A central, independent body should guide stakeholders on how to implement RWH systems and their applicability.
- Access to funding channels must be increased for SMEs, including reform of Enhanced Capital Allowances scheme.

systems where the water is pumped below or above ground, drawing on successes in Germany and Australia.

But these conventional systems are not necessarily relevant to the UK. Buildings in Germany traditionally have basements and those in Australia often boast large lot sizes. Instead, more innovative solutions are needed, some of which are under development.

The research found policy tools, like the Code for Sustainable Homes, promote RWH within the construction sector but provide limited guidance on the implementation process and do not apply to retrofitting existing housing stock.

It recommended the formation of a central, independent body to be responsible for coordinating the distribution of all information, manuals and funding relating to RWH.

Improving access to a wider range of indirect sources of finance would increase the attractiveness of RWH to stakeholders, it said.

In 2008 the Carbon Trust announced a £31 million loan pot available to SMEs for energy efficiency measures but water was excluded.

Greater integration of water and energy efficiency schemes is required and steps are only now beginning to be made in this direction, said the research.

SMEs and developers would benefit from greater transparency of the application process for the Enhanced Capital Allowances scheme – a scheme that offers businesses tax relief on water-saving investments – to encourage retrofit solutions for RWH systems.

Comments and implications

Dr Sarah Ward, an associate research fellow at the Centre for Water Systems, said: “The rainwater harvesting industry in the UK is beginning to demonstrate similar features to RWH in market leading countries such as Germany, Australia and Japan.

“But current policy mechanisms do not go far enough in enabling stakeholders to successfully put rainwater harvesting into practice. Despite a willingness by SMEs and householders to consider RWH, it is still regarded as aspirational and difficult to implement.”

She commented that those countries in which RWH has been successful have set up an integrated national water programme, which included direct support for RWH projects.

She said: “The UK has a range of water policies but there is a lack of integration and clarity on how they relate to RWH. Crucially, RWH is not being embedded in UK government initiatives that focus on how the country will adapt to the effects of climate change.”

Dr Ward said that greater visibility of policy documents drawn up by government departments and innovation in the design of RWH systems would be vital to the success of RWH in the UK.

She said: “A freely available signposting document should be produced to allow stakeholders easy access to information on RWH

About the University of Exeter's Centre for Water Systems

The Centre for Water Systems' research activities address a need to support, develop and implement sustainable water management systems for the future benefit of society and the economy.

The Centre, which was established in 1998, brings together more than 25 researchers from civil, environmental and computational engineering, making it the largest UK group in its field and one of the largest worldwide.

It is a key player in many large projects funded by the Engineering and Physical Sciences Research Council and has been particularly successful under the Sustainable Urban Environment programme.

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implementation. This document could be signposted in revisions to current policy documents and could explain when and where RWH systems are most appropriate.”

Professor David Butler, Director of CWS, added: “Emphasis needs to be placed on the development of innovative RWH system products. About five years ago the chairman of the Environment Agency made a call to British industry to develop products that could assist with floodwater management.

“A similar, equally urgent call needs to be made for RWH to help increase the adaptivity and resilience of water supply infrastructure in the face of climate change.”

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