Desalination plants a 'hidden asset' for power, water

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Scientists say their findings can turn the tap on new options for urban water and energy management. Credit: Griffith University

Renewable hydropower generated from desalination plants and other existing infrastructure would bring economic and environmental benefits to our biggest cities, according to new research from Griffith University.

Based on studies focused on Warragamba Dam—the main water reservoir for Australia's biggest city, Sydney—scientists say their findings offer new options for government, industry and city planners on urban water and energy management.

The findings are published in the esteemed journal, *Renewable and Sustainable Energy Reviews*.

Project leader Dr Oz Sahin, from Griffith University's School of Engineering and Climate Change Response Program, says there is particular merit in integrating infrequently used desalination plants into city water supply networks and planning agendas.

"Integrated asset management using existing infrastructure is a calculated way of meeting the need for more efficient water management, including flood mitigation and water and energy storage," he says.

"The Sydney example reveals that the infrastructure and technology are already there to generate renewable energy that can be fed into the city system without the need for, and heavy cost of, extra mitigation measures such as building new dams.

"In turn, these findings can inform other cities facing ongoing and mounting pressures with regard to the storage and delivery of water and energy."

The paper—co-authored by Professor Rodney Stewart (Griffith University School of Engineering), Professor Damien Giurco (University of Technology Sydney) and Professor Michael Porter

(Deakin University)—says: "Sydney's interdependent goals of deferring capital intensive flood storage works, maintaining water security, better utilising existing desalination and hydropower assets, and increasing renewable energy generation, can be achieved through applying systems thinking to a complex city-wide water planning problem."

In particular the research reveals the advantages of rethinking and broadening the role of desalination plants, many of which have spent extended periods in "standby mode" while their fundamental purpose has gone unrequired.

"Back in 2002, the extent of the drought in Australia saw cities start building desalination plants in order to provide water security for the future," says Dr Sahin.

"Perth exhibited better planning by building plants earlier and more economically. Sydney, Brisbane and the Gold Coast followed and they were more costly and at times controversial.

"However, just because circumstances mean the plants are spending long periods on standby, doesn't mean they cannot be used in other beneficial ways.

"This research shows that building more dams isn't necessarily the key to water security, but that it is better to consider what infrastructure is already there and how it can be used.

"For example, desalination plants can generate renewable hydropower for those times of peak demand in our cities by increasing supply during those hours.

"The benefits from this approach would include reductions in water costs for consumers and overheads for government and industry."

Dr Sahin says that despite some predisposed views about the capacity and capability of desalination plants, they are a hidden asset that should be considered by government, industry and the water and power planners of our major cities.

Provided by Griffith University