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Desalination and water reuse—sustainably drought proofing Australia

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ABSTRACT

Desalination has simply been too expensive for major application in Australia and the world, but rising costs of developing our remaining water resources (partly due to climate change), coupled with a growing demand for water supplies of varying quality for domestic, mining and industrial purposes, are making us look more closely at the rapidly developing desalination technologies. Water agencies in Australia have increasingly become involved in desalination initiatives. This has led to a greater understanding of desalination technologies, specifically seawater reverse osmosis (SWRO) and brackish water reverse osmosis (BWRO) and their consequent use as water supply options for industrial, mining and municipal purposes. A comparison of the basic features of the Australian market, the rapid adoption of the technology, the costs, the technology variations and its expected future to the rest of the world markets will be undertaken. Arguments in relation to the sustainability of Australia's SWRO plants and SWRO in general are presented. The paper will argue why SWRO is one of the most sustainable water sources in Australia and the world, replacing conventional sources for future development. This paper will touch on financing, contracting, design, operational and environmental characteristics related to SWRO and demonstrate why Australia's projects are leading the world in terms of sustainable desalination. Australia's six major seawater desalination plants, "The Big Six" will be discussed. New technologies and other forms of desalination and their applications, such as the growth of BWRO desalination in the coal seam gas extraction industry and SWRO in mining will be mentioned. Future developments in desalination will be discussed. The general status of world desalination will be presented.

Keywords: Australia; Desalination; Seawater concentrate management; Energy use; Ecological footprint; Sustainable water source; Triple bottom line

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