



Future prospects for desalination in the GCC countries

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The total area of the Gulf Cooperation Council (GCC) countries is about 2.6 million km² with an approximate total population of 53.4 million in 2016. The per capita total renewable water resources (TARWR) in GCC countries in 2014 was just 86.6 cubic meters, compared with the global average of almost 17,575 cubic meters. It is predicted that water availability in the GCC countries will be reduced significantly by 2030.

Desalination is considered the major water supply in the GCC countries. About 63% of the water supply in GCC countries comes from desalination. The current GCC seawater desalination capacity is nearly 18.2 million m³/d (4,000 MIGD). Conventional water resources such as fresh surface water and renewable groundwater are limited. Reuse of treated wastewater is about 900 million cubic meters, which is equivalent to 31.0% of the total treated wastewater. Treated wastewater is used mainly for irrigating green areas.

It is expected that the total annual GCC water demand will increase by 40% in 2030 and may reach more than 50 billion cubic meters (Bcm). This may lead to a large deficit in the GCC water resources of about 20 billion cubic meter. The GCC countries plan to install and expand more desalination plants to meet the growing domestic water demands.

In this work, the contribution of desalination plants in bridging the gap between supply and demand in the GCC countries will be examined. The future prospects for desalination in the GCC countries depend on integrating established and emerging desalination technologies. Several recently developed desalination technologies promote lower energy consumption based on renewable energies. Nuclear energy offers an attractive and economical alternative source for power generation and water desalination for sustainable development in the energy and water sector.