When is desalination the right choice?

By **Nick Michell** - December 7, 2016

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Jonathan Andrews *spoke to a select panel to break down some of the more common controversies surrounding desalination, and asks if water scarcity can make desalination plants environmentally, financially and politically feasible*

When–if ever–will desalination become economically and politically competitive with other water supply options for thirsty cities?

Michel Canet, Business Development Advisor, Veolia Water Technologies

Take Saudi Arabia as an example where thermal multi-stage flash [MSF] plants have been installed for more than 30 years. It is clear that the only economical and political water supply option is to continue to use desalination but the authorities should take into account the availability of new technologies such as multiple-effect distillation [MED] and reverse osmosis [RO], which can be combined. A 15-year-old MSF plant can be replaced by a hybrid plant of MED and RO technology to produce more than double the quantity of water with less electricity and steam consumption.

Heather Cooley, Co-Director, Water Programme, Pacific Institute

Desalination is among the most expensive options, and water managers may reduce the output of a desalination plant when demand drops or when less expensive options are available. Because of the fixed costs of the plant, reducing the output can increase the unit cost of the water produced which can further reduce demand or make other supply options even more economically attractive. In response, water managers may temporarily or permanently shut down the desalination plant. This can reduce the variable operating costs associated with the plant but ultimately leave ratepayers to pay off a plant while receiving little to no benefit from it. This would be a disservice to the community and the industry.

Emilio Gabbrielli, Director, Overseas Business Development, Toray and President of the International Desalination Association (IDA)

It already is. If fact, when you consider both desalination per se and advanced reuse, these should be considered as complements or alternatives to mainstream water supply in most situations where water resources planning is done. The technology involved is mature and reliable, and costs are often competitive with traditional treatment processes. In many cases, they are actually already cheaper, not only safer in terms of quality. The value of desalination and advanced water reuse is being recognised more and more, and political interest and support to explore these alternatives is growing fast.

Denys Neymon, Chief Executive Officer, Treatment Infrastructure and Executive Vice-President, Suez

For coastal cities, desalination is a complementary solution to other water supply systems. It is the best and only solution when no other options are available, and due to its cost of under US$1 per cubic metre, it is always economically and politically competitive, especially for coastal cities in developed countries.

Shannon McCarthy, Co-Founder and Partner of United4Water and 1st Vice-President, International Desalination Association (IDA)

Desalination is not in competition with dependable conventional water sources. Desalination competes economically and politically with the costs of no freshwater at all or inadequate quantities of freshwater. Desalination can provide a sustainable source of freshwater for coastal cities that have either limited or no dependable freshwater sources. More than 300 million people around the world rely on desalinated water for some or all of their daily needs. Increased efficiency has already achieved substantial reductions, and there is every indication it will continue to do so.

Adam Scow, California Director, Food & Water Watch

Smart water agencies are making great strides in adopting efficient water management practices such as conservation, groundwater cleanup, reuse, and recycling. Desalination is an expensive and speculative option that could drain resources away from these and other more practical solutions. It should only be the option of last resort after all other and better supply options have been fully developed. Desalination will not fix or make up for the many water abuses and blunders that exist in the world today.

David Zetland, Assistant Professor, Leiden University College

Constantly improving technology means lower costs for desalination, but also lower costs for similar technology like wastewater recycling. Cities interested in saving money should therefore always consider recycling before desalinating water. From a political perspective, this can also be easier, as wastewater is easier to access than salty or brackish water that may be part of fragile ecosystems. Both of these technologies are less efficient than using rain water and cheaper surface and ground sources, of course, so we're talking about 'always more competitive, never the most competitive'.

How might desalination cause as many problems as it solves, or indeed solve more problems than it creates?

Canet, Veolia

It is difficult to weigh the social developments of a remote and thirsty region created by the viability of desalinated water versus the environmental problems created by brine rejection, global warming pollution, and water pricing for a low-income community. The only recommendation is that desalination projects should be done after a detailed feasibility study where comparisons between alternative solutions such as wastewater reuse, ground water, or recharged water tables are available for a final decision.

Cooley, Pacific Institute