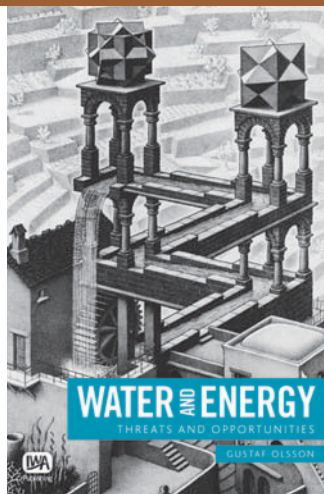


## WATER AND ENERGY: THREATS AND OPPORTUNITIES<sup>2</sup>



The theme of this book is the couplings among energy supplies, water supplies, and food supplies. Energy production (particularly shale gas) requires large volumes of water; water distribution and utilization requires energy; and agriculture requires both energy and water. Climate change and population growth will place increasing demands on both water and energy resources: the author suggests that we are likely to run out of fresh water before we run out of energy. He maintains that we need to change our current ways of doing things to reduce CO<sub>2</sub> emissions and to better manage our water resources.

The first part of the book is an excellent overview of energy and water resources, with a particular emphasis on the less-developed parts of the world. This is followed by a discussion of the linkages among water, climate, population, and food, in which the author stresses the effects of climate change, increasing urbanization, and improving (if that's the right word) diets. The author uses the concept of "virtual water" and "water footprint" to illustrate the impact of diet on water resources. About 14,000 liters of water are required to produce 1 kg of beef and about 3500 liters of water are

needed for a kilogram of chicken, compared to a few hundred liters for a kilogram of wheat or potatoes. Increasing consumption of animal protein is placing demands on water resources as well as being a major source of pollution. The concept of "water footprint" is also applied to energy production: a major conclusion is that energy production from biomass has a huge water footprint as well as being a marginal net source of energy. The author makes a strong case for water pricing as a way to rationalize demand.

The second half of the book is a series of (mostly short) chapters on specific topics: hydropower, fossil fuels, biofuels, cooling water from power plants, industrial processes, water operations including wastewater treatment, biogas, and desalination. The author points out the inefficiencies of many current practices (in terms of both water use and energy consumption) and suggests practices that would reduce both the carbon and water footprints of these processes. I found the coverage a bit unbalanced: a long section on pump performance and pressure management in piping systems seemed out of proportion to the general style of the book. It is interesting that many of the examples of improvements that can be made come from Germany and the author's native Sweden: these countries are taking the lead in introducing technologies that conserve both energy and water.

The style of writing is highly readable—informal, with lots of bullets, and chapter summaries, although the English is occasionally slightly idiosyncratic. The book will be readily accessible to students and policymakers with limited scientific background and is filled with useful figures and examples. I would turn to it instantly if I had to give a lecture or teach a course on sustainability. It would make great reading for policymakers (if only ...). The author writes with authority, and he backs up his arguments with data: this is not an environmentalist polemic.

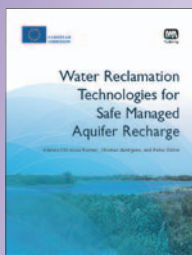
**James I. Drever**, University of Wyoming

<sup>2</sup> Olsson G (2012) *Water and Energy: Threats and Opportunities*. IWA Publishing, ISBN 978-1-780400-26-6, 300 pp, £69

## Groundwater Books



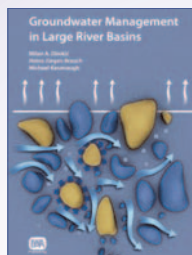
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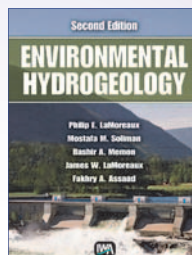
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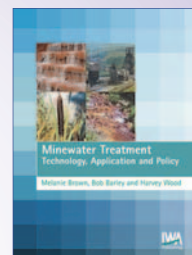
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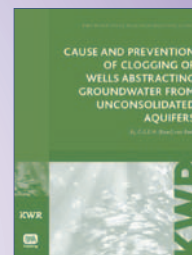
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