Among the other topics dealt with are molecular mechanism and treatment options for muscle wasting disease, curing HIV: pharmacologic approaches, mechanism of monoclonal antibody and drug interaction.

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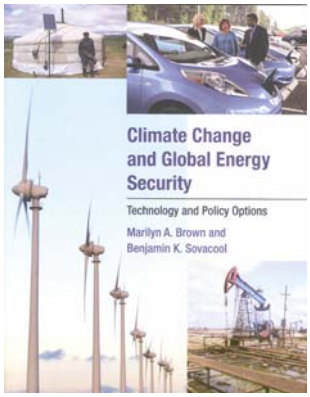



**Climate Change and Global Energy Security: Technology and Policy Options.** Marilyn A. Brown and Benjamin K. Sovacool. The MIT Press, 55 Hayward Street, Cambridge, MA 02142, USA. 2011. x + 416 pp. Price: US$ 29.00.

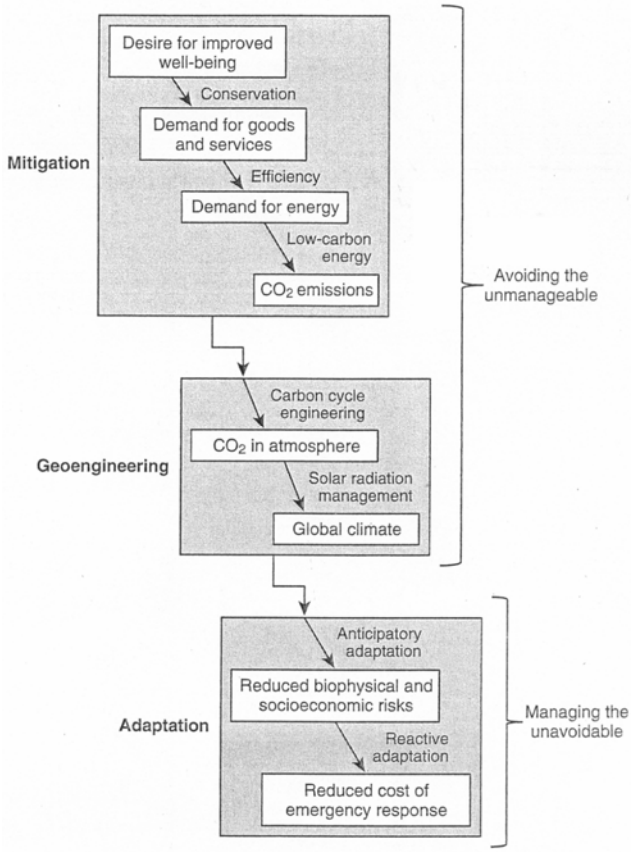
Brown and Sovacool begin chapter 4 (on geoengineering and adaptation) of this book with the example of Mughal Emperor Akbar in the 16th century having a new capital built at Fatehpur Sikri, 40 miles west of Agra. Presumably for safety and aesthetic (panoramic views) reasons, it was built on higher ground than the surrounding areas. Within 15 years after it was completed and occupied, the capital had to be abandoned because it was too difficult to transport sufficient water up from the surrounding areas. Eventually Akbar moved his capital back to Agra, closer to a perennial river.

The authors give this as an example of a mal-adaptation to one's environment. A recurring theme in this book is why people do not act when they should, especially when there are examples of people not acting and having suffered, or of acting and having benefitted? One problem of teaching by example (the case study method) is that for every example, human life is diverse enough to have thrown up a counter example. With similar topography, Bangalore was established almost 100 years before Fatehpur Sikri on a plateau higher than the surrounding landscape. Water was made available by creating hundreds of man-made lakes. Today, most of the lakes are gone. Those that remain are no longer a source of drinking water. Water is pumped from the Cauvery River, a hundred kilometres away, thanks to cheap electricity. Different times, different solutions.

The book contains a useful chapter on technologies for mitigating climate change (chapter 3). Barriers to effective climate and energy policies are discussed in chapter 5, and ways to overcome them in the next chapter. The book contains descriptions of eight successful case studies that succeeded because, the authors claim, they used 'polycentric' methods of implementation. From Asia the two case studies are Bangladesh's Grameen Shakti and China's Improved Stoves Programme.

Whenever I read of geo-engineering options as a means of responding to climate change, I am reminded of a quip the trade unionist Lane Kirkland (AFL-CIO) made 30 years ago to characterize the policies of Henry Kissinger: 'when two wrongs don't make a right, try three'. The same utilitarian mindset that causes the problem in the first place by the use of fossil fuels (cheap and easy), that refuses to mitigate the problem (alternatives are too expensive and complicated), looks to geo-engineering as a possible saviour (because it offers a cheaper and easier alternative to mitigation; p. 129, 137).

The authors give the example of Mexico City which banned driving cars on alternate days based on odd or even license plate numbers to address congestion. The response of people was to acquire two cars to drive on alternate days. This did keep many cars off the road, but did little to reduce traffic congestion or pollution. The book uses both climate




Schematic diagram of mitigation, geo-engineering and adaptation approaches. Adapted from Marilyn A. Brown, 'The multiple dimensions of carbon management: mitigation, adaptation and geo-engineering', *Carbon Management* 1, 2010, no. 1, pp. 27–33.

change and the need for energy security as prods to action, but often these are perceived to be the least important drivers.

The authors miss that the poor have a high discount rates, as A. K. N. Reddy's research has amply demonstrated. Discounting the risk of future, adverse effects apply equally to individuals and to countries.

To have an impact on their readers, the authors readily resort to using adjectives and adverbs. Cumulative emissions in the next 25 years, instead of being estimated in, say petagrams, are called 'staggering' (p. 102). Some errors that could have been removed have remained in the published version. Iran and North Korea are called non-signatories to the Nuclear Non-Proliferation Treaty (p. 5); the units for retail price of gasoline are printed as cents/gallon instead of $/gallon (Table 3.3, p. 96); air is called 80% $NO_2$ instead of $N_2$ (p. 102); New York City's $4 \times 3$ matrix (Figure 4.4; p. 144) is called a $2 \times 2$ matrix (p. 143); with an Additional Registration Fee of 185% (p. 275), the cost of a Toyota Corolla in Singapore is over-stated to be US$ 66,000 in the 1990s (p. 281) but only US$ 40,000 today, whereas it should have been cheaper in the 1990s; in China, indoor smoke released from solid fuels is called more dangerous than obesity, road traffic accidents, urban air pollution, and unsafe sex, combined (p. 296). However, Figure 8.9 (p. 297) shows them individually smaller, but not when combined. Regularly is spelt as regulatory on p. 309. One could go on.

It is unfair to carp only on the negatives one finds in the book. It contains many good parts. Figure 4.1 (p. 126) is the most succinct and useful way of summarizing the options we have of responding to climate change. The authors show how despite cost declines in prices of renewable energy technologies due to learning, how supply and demand can cause temporary upswings in prices. They show how a combination of different renewable energy technologies could meet the entire electricity demand of Germany (p. 121). They show how automobile engine technologies that give 40 km/l have existed for a long time, but have been suppressed by at least one multinational auto company. They emphasize that problems (climate change, energy security) are neither purely technical nor purely social, but essentially socio-technical.

The authors have also garnered many good quotes. Here is a sampling of a few that resonated with me. 'A fundamental principle of a civilized society is to protect people from harm done by others'. (Archer and Rahmstorf, frontispiece). Failure to internalize pollution costs is said to be the 'organized irresponsibility of the modern economy' (Beck, p. 156); 'human beings more resemble a ravaging bloom of algae or a mould enveloping fruit rather than protective or prudent stewards of our planet' (Peake and Smith, p. 319); and 'human race is challenged more than ever to demonstrate our mastery – not over nature but of ourselves' (Carson, p. 328).

We should not end on a note of despair. I am reminded that Alva Myrdal, in her book *The Game of Disarmament*, published in 1976 acknowledged that she had close to despair over the inability of humanity to respond to collective danger it faced. Still she insisted that there is always something, however modest, that each person can do: 'Otherwise there would be nothing left but to give up. And it is not worthy of human beings to give up'.

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