Review: Structuring an Energy Technology Revolution
By Charles Weiss and William B. Bonvillian

Reviewed by Jan Kunnas

Weiss, Charles and Bonvillian, William B. Structuring an Energy Technology Revolution. Cambridge, MA: MIT Press, 2009. 318 pp. ISBN 9780262012942. US$24.00/£15.95, cloth. Alkaline paper.

The 2008 U.S. presidential campaign produced proposals for substantial increases in spending on energy technology and innovation, but with limited detail on how that effort was to be carried out. In this book Charles Weiss and William B. Bonvillian give those details. More than a book, this is a concrete plan for a federal program - on the scale of the Apollo Program – to stimulate technological innovation in energy. This makes it an essential read for all U.S. policymakers, but also makes it somewhat inaccessible for the layman. Readers are helped out with a comprehensive 7 page glossary, and another two pages for abbreviations.

The authors argue "that a major supply-side program to stimulate innovation in energy technology is needed to complement a demand-side carbon tax or cap-and-trade scheme" (p.ix) and continue to outline how it should be put into effect. It should be noted that they do not propose an alternative but a complement to carbon taxes or a cap-and trade scheme. Furthermore this program can be launched now while further political support is developing for demand-side measures, and might diminish opposition to demand-side measures by showing what is actually possible by advancing technology solutions.

The book has a clear, although repetitive, structure. A large number of promising energy technologies are assessed and classified according to the likely obstacles to their launch, and technology-neutral packages of policies and incentives are developed for each of these launch classes. The gaps in the existing U.S. framework for stimulating innovation are identified, and finally three institutional innovations to fill these gaps are proposed: a new translational research projects agency for energy to identify innovation challenges and nurture the breakthroughs needed to meet them; a government corporation for the financing of demonstration projects, manufacturing scale-up, and conservation investments; and a roadmapping think-tank for technology assessment and policy research.

Based on a comparison with other areas of the U.S. economy that are intensively adopting new technologies in a manner roughly comparable to the technology transition that will be required in energy they argue that the energy sector is underinvesting in research and development (R&D). The information technology and biopharmaceutical sectors typically spend between 10 and 20 percent of their revenues on R&D, while the combined public and private expenditures on energy R&D is less than 1 percent of the annual revenues of the energy sector. The financial resources needed to multiply the investment in energy R&D and implementation could be found for example from cap-and-trade legislation aimed at emission reductions, or from cancelling the federal tax subsidies to incumbent high-emitting energy industries, principally the oil industry.

Weiss and Bonvillian argue that innovation in energy technology, although a global imperative, depends on R&D at the national level. They are convinced that the U.S. innovation system, which was ranked number one in the World Economic Forum global survey in 2008, is entirely capable of meeting this challenge. In a book by U.S. authors aimed for U.S. readers, a conclusion that U.S. leadership is still essential if innovation is to occur with the urgency we need, is no surprise. As a European Union citizen, I would like to protest. Extending on the Apollo analogy, I call for another race to the moon. Ultimately all citizens of the world would be winners in such a race, but there are also national benefits for the race winner(s):

"The United States should keep in mind, too, that the economic advantages of leadership in technology have been the source of its wealth and well-being. Is it really in America's interest to cede leadership of a technological revolution in energy to other countries that now also understand the innovation-based growth model?" (p. 7).

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