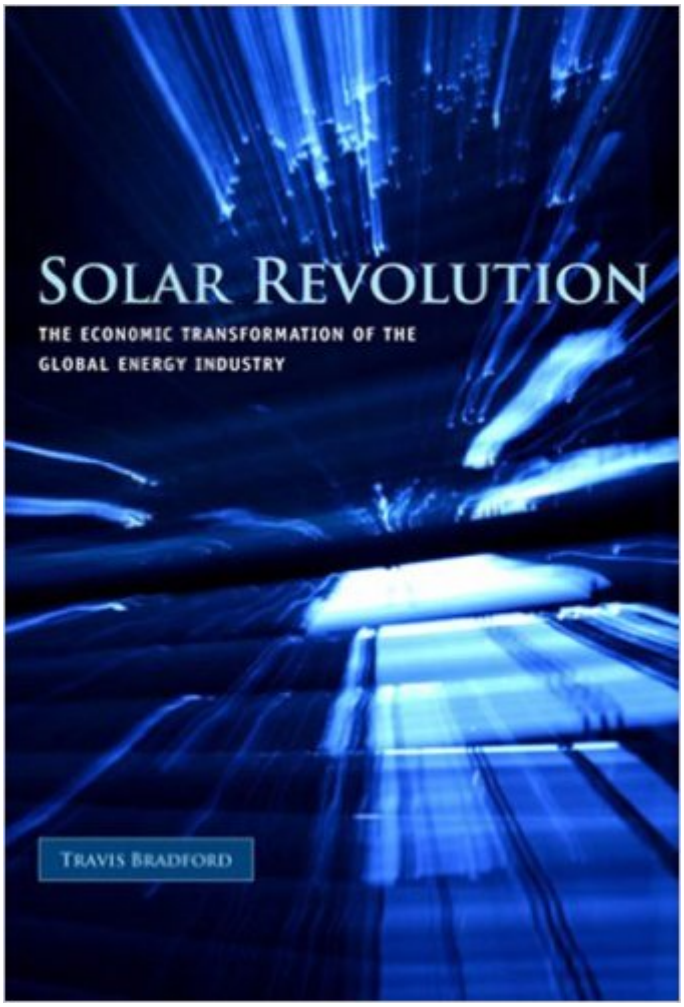
Solar Revolution: The Economic Transformation Of The Global Energy Industry (MIT Press)



Synopsis

In Solar Revolution, fund manager and former corporate buyout specialist Travis Bradford argues -- on the basis of standard business and economic forecasting models -- that over the next two decades solar energy will increasingly become the best and cheapest choice for most electricity and energy applications. Solar Revolution outlines the path by which the transition to solar technology and sustainable energy practices will occur.Developments in the photovoltaic (PV) industry over the last ten years have made direct electricity generation from PV cells a cost-effective and feasible energy solution, despite the common view that PV technology appeals only to a premium niche market. Bradford shows that PV electricity today has become the choice of hundreds of thousands of mainstream homeowners and businesses in many markets worldwide, including Japan, Germany, and the American Southwest. Solar energy will eventually be the cheapest source of energy in nearly all markets and locations because PV can bypass the aging and fragile electricity grid and deliver its power directly to the end user, fundamentally changing the underlying economics of energy. As the scale of PV production increases and costs continue to decline at historic rates, demand for PV electricity will outpace supply of systems for years to come. Ultimately, the shift from fossil fuels to solar energy will take place not because solar energy is better for the environment or energy security, or because of future government subsidies or as yet undeveloped technology. The solar revolution is already occurring through decisions made by self-interested energy users. The shift to solar energy is inevitable and will be as transformative as the last century’s revolutions in information and communication technologies.

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Customer Reviews

This is a clearly written short book with good news about photovoltaics by someone familiar with economics and business. Although its title is Solar Revolution, there are many aspects of solar energy in which he shows little interest and this makes the prospects for his revolution depressing. Here are the basics of the solar revolution as he sees it.The revolution’s goal is to overthrow the use of fossil fuels and nuclear power, but all without returning to any of the traditional uses of solar energy that supported mankind through history. We abandoned Mother Nature’s solar teat to suckle on giant bottles of fossil fuels. Now the bottles are going dry and we want to return to solar, but it’s got to come in bottles, be electric, be synthetic. Bradford’s concern is the preservation and continued growth of our use of electricity. When you stop to consider that electricity is a means to an end and not an end in itself - as, for example, water or food - this is a puzzle.Our appetites expressed through the market place are too slack for Bradford, the revolutionary. Although he claims to wish an end to subsidies, it is hard to believe him. He greatly admires Japan and Germany for their fanatical government-directed drive for photovoltaics. On September 1, 2006 Sharp electronics, a company singled out for special praise by Bradford, ran full page color picture ads in the Wall Street Journal and New York Times. They boasted that their Kameyama plant "features the world’s largest solar energy system".A glance at their building shows they use no skylights. They cover every inch of roof with PV panels. The walls have few if any windows. The building looks like a giant sealed-off, above ground termite nest.The Japanese and Bradford are confused.

This should have been a magazine article in the Economist, not a book. As other reviewers have explained, this is about photovoltaics and only photovoltaics (PV) and even at that it’s limited. True, other energy sources are mentioned, such as hydrogen fuel cells, but they get about half a page.It would be better titled "The Estimated Economics of Photovoltaics." But even at that it’s weak. Photovoltaics come in many forms from rigid structures to concentrators to flexible fabrics. Only round numbers are used, such as, "In the case of photovoltaic modules, the cost to produce them in the late 1970s was around $25 per watt but has since dropped to less than $3.50 per kW,..." (p, 109) But there’s no mention of the applicable configuration.Some things are footnoted, like "Various forms of solar energy have been used since prehistoric times." But others, like Figure 7.2 where today’s PV costs are shown at $6 per watt are not. And the $6 per watt in Figure 7.2 hardly

correlates with the $3.50 quoted above for production costs. Yes, I know one is production cost, the other presumably installed cost, but even that isn't clear and an installed cost that's 1700 times production cost deserves some explanation.I couldn't find one reference to actual PV conversion efficiency, yet there are statements such as "Even at today's efficiency of PV cells, the land required would be 10 million acres, or 0.4 percent of the total land area of the United States." Perhaps the efficiency assumption is buried in the primary documents but it should be shown here since it's pivotal. I didn't notice any reference to the fact that today's PV's degrade over time. PV efficiency and life is fundamental to PV economics.