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## Of Thermonuclear Fusion, Mice and Men

*It is the mark of the mind untrained to take its own processes as valid for all men, and its own judgments for absolute truth.* - Aleister Crowley

Much has been written, argued and pontificated about the current administration's role in guaranteeing loans to the solar industry, so I don't feel any need to pile on. Based on most of the reporting of this though, I believe that a teachable moment was wasted. On this I will weigh in.

Our sun is an awesome energy source. *Each second*, the sun transforms 700 million tons of hydrogen gas into 695 million tons of helium gas through the nuclear reaction of fusion. The remaining 5 million tons of matter (about 600 times the weight of water flowing over Niagara Falls in one second) escapes as pure energy, or what we experience as warmth and light. Harnessing this vast energy source has been an obsession of many brilliant scientists for years. In 1839, Alexandre Edmund Becquerel first observed the photovoltaic effect via an electrode immersed in a conductive solution exposed to light, and in 1954 Bell Labs introduced the first modern silicon solar cell. That first solar cell was about 6% efficient in converting the sun's energy to electricity (current solar cells are about 41% efficient).

Enter the politicians. In a misguided attempt to boost economic activity, help the solar industry and speed up the use of solar panels, many governments, including our own, provided incentives to both the producers and the consumers of these products. As there was money to be made or saved, investors and consumers rushed to get their slice of pie. The politicians did get one thing right; the demand for solar panels did increase along with their supply. What they hadn't counted on is that when this much money flows into an industry through subsidies, not competitive market forces, many new entrants are drawn in. The new players learn from early developers and typically produce products that are better and cheaper than the original. The weaker players are not exposed until the tide of subsidies goes out and reveals those without a bathing suit. In the budget predicaments now facing us and many developed countries, governments have had to slash expenditures. When large numbers of your people are suffering, subsidies are difficult to defend and typically the first to be cut.

According to a recent Wall St. Journal Article, the combined value of the 12 largest solar panel manufacturers in June of 2008 was \$60 billion. Today they are collectively worth \$6.4 billion. When the tide ebbed, there was plenty of exposed flesh. It turns out that manufacturing solar panels is actually not all that complicated. Because of this many manufacturers sprung up (many of them in China) and began to drive the price down through increased supply and process improvement. The subsidies only served to create artificial demand (many would not have installed these but for the tax credits), and masked the inefficiency of the marginal producers. When these subsidies ceased, so did many of these companies.

Markets, collectively, are much smarter than any one man (or even one woman for that matter). Government intervention to effect outcomes is doomed to fail, sometimes spectacularly. Government's role should be to make the playing field level, and then get back to the bleachers.

There is a story that most in the technology field know. It is the not so mythic tale of a guy named Steve Jobs, who after seeing a device invented by Xerox that controlled the movement of the cursor on a computer screen separate from the keyboard and connected by a wire, was convinced that this device was key to the future of personal computing. The problem was that the then existing device was clunky and costly (around \$300). He returned to his company with marching orders for his engineers to develop a sleeker, more useful version that would cost around \$15. The "mouse" was born. No subsidies, no tax credits, just a great idea with even greater execution. What a concept.

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