

MIT: future is solar—Perry Sioshansi's Letter from America

The sheer scale of solar resource suggests it may ultimately prevail.

Central to the debate about the fundamental drivers of change is where the required energy to power the globe will be coming from, from what source and in what form. The answer depends on who you ask. The fossil fuel industry—oil, gas, coal—would want you to believe that when it is all said and done, they will be the ones who will fill the car tank and keep the lights on—climate be damned. The nuclear people would want you to switch all electricity generation and much of the transportation sector to atom. The renewable proponents say the answer is ultimately renewable, and the sooner the better.

A May 2015 report by Massachusetts Institute of Technology (MIT), titled *The Future of Solar Energy*, might as well be called the “future of energy is solar.” And it is not hard to see why. For a start, there is so much of it everywhere. The report points out that the “solar resource is massive by any standard.” Covering 0.4% of US land with today's technology will provide sufficient electricity to meet US demand. Not impressed? Consider the fact that this is roughly half of the land area currently devoted to produce corn for production of ethanol, which contributes barely 7% of the energy content of US gasoline. That much to give you a sense of solar's potential scale.

Everybody, of course, knows the drawbacks of solar, namely the fact that it is diffused and it is only available when and where the sun is shining, which is not all the time or everywhere. Additionally, one needs to deal with integration, intermittency, costs and a host of other issues. The opening sentence in the report's Executive Summary says: “Solar electricity generation is one of very few low-carbon energy technologies with the potential to grow to very large scale.”

The study is focused on three main issues: reducing the cost of installed solar capacity; ensuring the availability of technologies that can support expansion to very large scale at low cost; and easing the integration of solar generation into existing electric systems. It achieves this and much more. It is comprehensive and technical—as one would expect from MIT. It covers the in and out, the why and when, and the what ifs of solar energy.

Its summary for “policymakers” reads: “The main goal of US solar policy should be to build the foundation for a massive scale-up of solar generation over the next few decades.” It does not say how massive the scale-up should be or over what time period, other than the vague reference to “next-few decades.”

It notes that small-scale solar, such as those on residential and commercial rooftops, is nowhere as economical as utility-scale. Yet each offers advantages. It also points out that the balance of system costs – that is everything other than the PV panels – constitute an important part in the overall cost and should receive more attention than they have received in the past.

Among its many findings, the report notes that the third-party ownership model, popularised by the likes of SolarCity, has been a game-changer for the residential solar market and points out that it is currently allowed in about half of the country—stating “residential solar would expand more rapidly if third-party ownership were allowed in more states.”

Without taking sides, MIT report states that utilities have been challenged by the rapid uptake of rooftop solar with a few—most notably Arizona's Salt River Project—introducing additional fixed charges on solar customers. The study acknowledges that net energy metering (NEM) schemes “result in a subsidy to residential and other distributed solar generators that is paid by other customers on the network.”

Yet it adds that not everyone agrees that net metering programmes are a net burden to the network or to non-solar customers. It refers to a 2014 study for Nevada Public Utilities Commission by Energy and Environmental Economics (E3), a San Francisco based consultancy, that concluded that a carefully designed NEM program can support self-generation without creating a burden on non-participants.

It is not the sort of reading that is well-suited for the beach, but timely and comprehensive while avoiding the hyperbole.

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