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SOLAR ENERGY

It's the Future, Sunshine

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A recent article by Swaminathan S A Aiyar ('Roll Out the Sun, But Gently', goo.gl/73sl8M) and an editorial ('Solar Power Calls for New Accounting', goo.gl/SgMGCM) on this page have cast doubts on the Centre's 100 GW target for solar energy by 2022. The write-ups have argued that solar prices are going to drop further on account of long-term interest-rate reductions and improvement in module technology, and that the costs of managing intermittency are steep. So, investments in 'expensive' solar today are questionable. But this thesis is fundamentally wrong for a few reasons.

First, compared to any other source of power today, solar prices are lower. The 500 MW Bhadla Solar Park auction in Rajasthan that closed on May 12, saw prices drop to ₹2.44 per unit, well below new thermal tariffs, or even the average ₹3.20 per unit rate at which the National Thermal Power Corporation (NTPC) sells electricity from its coal plants. On this simple economic comparison alone, all new capacity addition ought to be solar-based.

Second, solar was priced at ₹15 per unit only four years ago. That is how the technology cost curve evolves. New technologies are expensive in the beginning. But with continued investments and resultant ecosystem development, they stabilise over time. The then-Gujarat chief minister Narendra Modi promoted the first 1,000 MW of solar that kick-started this entire industry. Had somebody not taken this bold initial step, all this progress would not have taken place.

The cost of everything other than the modules — inverters, cables, module structures, etc, that make up more than 50% of the entire cost of a solar project — will reduce only if a market for them is nurtured. And that is what successive governments have done. The National Solar Mission must surely rank as one of the public policy success stories in recent years.

To argue that solar prices will reduce even more and, therefore, we should not lock into tariffs today is specious. First, solar is already 'cheapest' today. On that score alone, it should be the preferred source for new capacity addition. Second, it doesn't degrade the environment.

We need to sensibly plan for risk and uncertainty by making regular investments over time, and not put all our eggs in one basket. Installing 10-20 GW of solar capacity annually over the next five years is entirely reasonable.

As far as the issue of intermittency is concerned, yes, solar is dependent on the sun, and the sun does not shine at any given place 24×7. Intermittency will be a basic problem when solar generation starts accounting for 15-20% of overall supply of power. So, we are some distance away from that. Still, many low-cost smart policy and technology improvements can be initiated today to improve the grid for tomorrow.

Take hybridisation of solar and wind energy. Combined solar-wind projects have capacity utilisation factors of over 50%, close to those of coal-fired power plants, drastically reducing the intermittency challenge.

FILE PHOTO

Soak it up

Second is the development of robust ancillary markets. Ancillary services are backup services that smoothen out the variable nature of energy supply. Germany has close to 3% of spinning, storage and other reserves to support its grid infrastructure. India has none.

Third, higher investments in high-voltage transmission lines to transport large amounts of energy over vast distances quickly and efficiently. Yes, transmission investments would be needed regardless of renewable capacity addition, to ensure the grid is flexible and able to meet our growing power needs.

Fourth, investments in software solutions to optimise grid-level operations and consumer-level behaviour. The creation of demand response programs, for example, can prod industries to shift their loads to times during the day when more energy is available on the grid.

Storage is another important area. If storage costs come down — which they will — that will be another way to manage intermittency. But storage is only one among many tools to ensure the smooth integration of renewable energy in the grid at prices that don't fundamentally change the economics of solar.

But even so, the problem of intermittency is overblown as there is an essential difference between capacity and generation. Every 4 MW of solar capacity is equivalent to roughly 1 MW of coal capacity because of lower load factors in solar. So, while it may seem like we are galloping ahead on annual solar capacity additions, the actual generation is only a fraction of that.

In other words, even though solar is about 6.5% of India's current capacity, it provides roughly only 2% of actual electricity. So, when Aiyar et al suggest that solar can bankrupt coal companies and strain the banks that finance them, it is a bit absurd.

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