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THE MARKETS ON MONDAY		
Sensex	29,135.88▲	40.95
Nifty	8,809.35▲	3.85
Nifty Futures*	8,845.05▲	35.70
Dollar	₹62.16	₹62.20**
Euro	₹70.97	₹71.00**
Brent crude($/bbl)	60.28 ¥	59.41**
Gold (10 g)##	₹27,400.00▲	₹60.00

*(Feb) Premium on Nifty Spot; **Previous day's close; ¥ At 6 pm IST
Market rate, including VAT and premium

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40 YEARS OF THOUGHT LEADERSHIP

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Speed, scale, skill... solar?

INFLEXION POINTS

ARUNABHA GHOSH

I once asked a rural bank officer how he managed to convince farmers to take large loans to install solar panels. He replied, "I remind them that they use two units of electricity a day (60 a month, 730 a year). This country has given you so much. Won't you install solar power, reduce your consumption from the grid and give back to the country?" This Kennedy-style pitch to market solar in India was heart-warming, even inspiring. But to reach 100 gigawatts (GW; which the government plans) by 2022, more than inspiration will be needed. In line with the prime minister's mantra, the solar sector has to match ambition with speed, scale and skill.

India has a little over 3 GW of installed solar power capacity. In order to reach 100 GW, installed capacity has to double every 18 months or at a compounded annual growth rate of 62 per cent, a tall ask by any standard.

The speed of execution depends on several factors. Delays in announcing policies create uncertainties. If developers do not know the tariffs for even the next financial year, how can they secure long-term, low-interest debt finance? Alongside, a roadmap for enforcing renewable purchase obligations (as Rajasthan has done) is urgently needed. A third issue is land availability. Less than 1 per cent of the barren and uncultivated land in the country would be sufficient for 80 GW of grid-connected projects. But land acquisition is not easy. Land accounts for 3.5 per cent of project costs but could increase with rapid deployment and price speculation. State governments could create land banks (Gujarat, Karnataka), lease government land for 25 years or less (Rajasthan), offer exemptions on stamp duties on sale of private land (Madhya Pradesh), or ensure a small share per unit of electricity to the landowner. Whatever the solution, it has to be implemented quickly.

There is no use investing in solar projects if the infrastructure to evacuate power to the grid does not keep pace. The Ministry of Power must provide detailed roadmaps for building new substations. The Green Corridors being implemented in Rajasthan and Tamil Nadu could be further expanded. Electricity regulatory authorities must also consider exemptions from wheeling charges. With net metering policies, grid-connected rooftop projects should be accorded priority in dispatching power.

With speed comes scale but there is more than one route. Council on Energy, Environment and Water (CEEW) researchers have proposed three alternatives: "utility heavy" (80 GW of utility scale projects), "rooftop heavy" (45 GW of rooftop projects), and "rural decentralised heavy" (20 GW of solar irrigation pumps). It might be tempting to dream of mega solar parks but they also bring with them the challenges of land acquisition and dispatch. If 15 per cent of irrigation pumps were converted to solar they would amount to 20 GW capacity. Similarly, one-fifth of the 31 million households with roof cover sufficient for 3 kW systems could add 20 GW. Scale can also have strong developmental co-benefits.

All three scenarios would need investments of about $140-$160 billion. These estimates include the costs of energy balancing, with storage equivalent to half of utility scale capacity. The costs increase by over 50 per cent when solar is balanced with gas-based backup. In order to absorb investments at this scale, new institutions and innovative finance would be needed. A Green Bank, initially capitalised via the National Clean Energy Fund, could offer low-interest loans with long-term tenure. It could help to channel infrastructure debt funds and investments from insurance and pension funds, as well as large overseas investors. Risk insurance (to ensure bankable projects), exchange swaps (to mitigate foreign exchange risk) and green bonds could reduce cost of capital and leverage more private financing. Housing finance companies could provide loans to property developers for rooftop systems.

The scale of ambitions will also impact manufacturing and imports. At current prices and with no expansion of domestic manufacturing capacity, India would need solar imports worth ₹2,14,000 crore ($35.7 billion) for 100 GW. If every year domestic production grew 1 GW and international panel prices fell 6 per cent, imports could fall to ₹96,000 crore ($16 billion). Reducing import dependence means much greater domestic competitiveness, as well as targeted investments in energy storage R&D.

For speed and scale, skills will be in demand. CEEW and the Natural Resources Defense Council found that between 2011 and 2014, the solar sector created at least 24,000 full-time equivalent jobs across the value chain from business development to design and construction, commissioning, operations and maintenance. If 100 GW were installed, as many as 1 million short-term and about 3,00,000 long-term FTE jobs could be created. These would be over and above any created in manufacturing. Nationwide training programmes, under the National Skills Development Agency, would have to be delivered through a network of trained entrepreneurs (for both grid-connected and decentralised energy projects).

Today, the largest investor conference for renewable energy in India, Re-Invest, will conclude. Up to 266 GW of renewable energy has been committed but financing commitments are less than 30 per cent of these numbers. The roadmap for a significant role of solar in India has many milestones. Speed, scale and skill are needed; there is little time to waste.

The writer is chief executive, Council on Energy, Environment and Water.
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