

COMMENTARY

Investing in Sustainable Energy: The case for solar technologies in Sri Lanka

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In light of the Ministry of Power and Renewable Energy's forecasts that the demand for electricity will grow by 7–8 per cent over the next decade, Sri Lanka is rightly seeking to increase stability and certainty in its electricity generation and transmission. We therefore applaud the Government of Sri Lanka's target to "increase the share of electricity generation from renewable energy sources from 50% in 2014 to 60% by 2020 and finally to meet the total demand from renewable and other indigenous energy resources by 2030."¹

Such ambitious goals require thoughtful planning and calculated risk taking. Policy-makers need to evaluate investment decisions based on value-for-money across the asset life cycle, which literally translates into asking: *What is in it for the citizen? What are the financial, economic, social and environmental multipliers that a given investment will generate across the Sri Lankan economy? And to what extent will the given investment contribute to sustainable and inclusive growth?*

In the case of energy investments, these questions are all the more pivotal given that we are planning for total energy security over the next 15 years.

Investment decisions have hence to be based on best-available technologies and the most

promising prototypes in global research and development (R&D) pipelines. Similarly, investment incentives have to be skewed towards encouraging domestic value-add and the upskilling of clean technology capacities in Sri Lanka.

Plans to welcome investment from India on coal-fired power plants work against this logic.

Coal is yesterdays' technology. Even as global commodity prices bottom-out at levels not seen since the Great Depression, investing in coal brings little value-for-money. **In terms of greenhouse gases, environmental pollutants and human health detriments, coal is a dirty technology.**

It tops the list in emitting carbon monoxide, carbon dioxide, nitrous oxides and sulphur dioxide, which contribute to climate change, acid rain and poor air quality. In addition to the particulate matter emitted from coal combustion, resulting emissions and wastes contain toxic constituents such as heavy metals, arsenic, mercury, polycyclic aromatic hydrocarbons, silica, fluorides and black carbon as well as many other hazardous compounds that also have adverse impacts on environmental quality and human health.

Bloomberg reports that air pollution caused by coal-fired power plants kills 4,000 people a day in China,² which is approximately 17 per cent of

¹ Ministry of Power and Energy (2015). *Sri Lanka Energy Sector Development Plan for a Knowledge-Based Economy, 2015–2015*. Retrieved from http://powermin.gov.lk/sinhala/wp-content/uploads/2015/03/ENERGY_EMPOWERED_NATION_2015_2025.pdf

² Morales, A. (2015, August 14). Pollution kills 4,000 people a day; Researchers. Retrieved from <http://www.bloomberg.com/news/articles/2015-08-13/china-air-pollution-kills-4-000-people-a-day-researchers>



the country's mortality level. Air pollution was the primary cause of 1.23 million premature deaths in 2010, **which in monetary terms is equivalent to between 9.7 per cent and 13.2 per cent of China's GDP.**³ Sri Lanka's coal investments will involve lower-ranking coals that are high in moisture content. These coals are hence **more expensive to transport and require additional processing, as they are highly inefficient to burn.** Clean coal technologies may be touted, but they are expensive end-of-pipe fixes. The chances are that the Government of Sri Lanka will have to work hard to insist that they be used, and this will greatly increase the **capital expenditure of the total investment. This makes coal investments even less bankable.**

In terms of innovation and the building of a knowledge economy, coal continues to disappoint. It offers few prospects in terms of technological innovation and upskilling. In addition, note the growing global divestment in fossil fuels. **As reported in *The Guardian* in September 2015, over 150 cities, 2,000 individuals and 400 institutions representing at least USD 3.4 trillion in assets are divesting in fossil fuels.**⁴ This includes the Rockefeller Group of Companies, the Dutch pension fund PFZW, California Public Employees' Retirement System (CalPERS), the California State Teachers' Retirement System (CalSTRS), the Norwegian Sovereign Wealth Fund, the London School of Economics and Germany's Protestant Church in Hesse and Nassau.⁵

Why don't we in Sri Lanka please leave coal investments aside? **Instead, let us make investors in India a counteroffer that will be very difficult to refuse—to replicate the India National Solar Mission 2022 in Sri Lanka. The story to date is most compelling.**

In January 2010 Prime Minister Manmohan Singh launched the **Jawaharlal Nehru National**

Solar Mission with the target of deploying 20,000 MW of grid connected solar power by 2022. This was accompanied by an astute piece of policy-making—aligning the Ministry for New and Renewable Energy with the more senior Power Ministry by setting renewable purchase obligations and signing long-term power purchase agreements for the export of photovoltaic (PV) solar power into the grid.

In 2014, Prime Minister Modi went a step further. (Let us not forget that Prime Minister Modi is a solar veteran. He installed more than 1000 MW of solar in Gujarat across 2010 and 2011 during his term as chief minister. At that time, this was more than the installed PV capacity in the rest of India). **The India Solar Mission target was increased fivefold to 100,000 MW by 2022. And Prime Minister Modi accompanied this target by even craftier policy-making, placing all of the portfolios for coal, renewable energy and power under one minister.**

The resulting rally from investors and manufactures within and outside of India has been impressive. **By the end of 2015, the pipeline of solar projects in India in terms of power purchase agreements signed and requests for selection issued is more than 10,000 MW.** Analysts that once suggested the 2022 target was “illusionary” now forecast that the pipeline will reach **15,000 MW by end of 2016.**

The Solar Energy Corporation of India been mandated to develop 20,000 MW of solar park capacity in various states. Large domestic manufactures such as Trina Solar, Sun Edison with Adani, JA Solar, Vikram Solar and Welspun are gearing up production and R&D. Additional market impetus is provided by joint ventures such as the Softbank, Bharti and Foxconn's SBG Cleantech on 20 GW of wind and solar technologies; Sunedison's investment in 15 GW; and Rosneft's plan for 10 GW.

The fundamental aims of the India Solar Mission were to reduce the costs of solar power generation in India and to fuel both the Make in India initiative and the Swachh Bharat Clean India Challenge. Here too, the signals are positive. Tariffs for solar power (in the

³ New Climate Economy. (2014). *Better growth, better climate*. Retrieved from <http://2014.newclimateeconomy.report/>

⁴ Carrington, D. & Howard, E. (2015). Institutions worth \$2.6 trillion have now pulled investments out of fossil fuels. *The Guardian*. Retrieved from <http://www.theguardian.com/environment/2015/sep/22/leonardo-dicaprio-joins-26tn-fossil-fuel-divestment-movement>

⁵ Koch, W. (2015). World Cities join growing push to disinvest from fossil fuels. *National Geographic*. Retrieved from <http://news.nationalgeographic.com/energy/2015/12/151202-cities-join-growing-push-to-divest-from-fossil-fuels/>



case of power purchase agreements of 25 years) are today INR 6.50 per unit, and as low as INR 5 per unit in several states, including Madhya Andhra Pradesh and Rajasthan. In 2014, when interest rates in India were in the double digits, 60 per cent of the tariffs went towards servicing loans. On the April 5, 2016, the Reserve Bank of India cut interested rates by 0.25 of a percentage point—to 6.5 per cent from 6.75 per cent. **At the time of writing, solar is selling for INR 5 per unit under power purchase agreements that span 25 years.**

The likelihood that India could lead a successful Sri Lanka Solar Mission is strong given that the fundamentals are similar. **In addition to grid parity, solar investments will also help us address some of the limitations in our power sector.** The distributed nature of solar can take generation to the load centres and reduce the **transmission and distribution losses.** We can also envisage **smaller solar parks—100 to 300 MW**—to support smaller industries and export processing zones. We can aim for solar charging stations for e-cars, e-scooters and e-bicycles. **But perhaps the biggest draw for solar is the post-manufacturing jobs that it generates. Over 60 per cent of jobs generated by the solar industry are downstream, in the customization, calibration and installation of technologies.** This alone is good news for Sri Lanka.

We might even envisage domestic manufacturing even though the domestic market in Sri Lanka alone may not offer large enough economies of scale to compete with manufacturing costs in India and China. **The economics of solar are based on balance-of-systems innovation that varies based on regional differences in quality, labour costs, codes, standards and material availability.** Scaling is also challenged, as increasing volume is also highly dependent on reliable long-term incentives and good infrastructure to allow rapid adoption of solar PV systems. Sadly, the uncertainties that surround Sri Lanka's renewable energy feed-in tariffs in the case of 10-year power purchase agreements hardly inspire confidence.

On the brighter side, however, the solar PV balance-of-system market has gained considerable attention as the next lever in driving down installed systems costs. **GTM Research reports that in 2008, 67 per cent of an average project's total cost was in the PV module; but today, 68 per cent of total costs resides in balance of systems, which includes a variety of structural and electrical components, labour and soft costs.**⁶ This may make the case to invest in solar even if total domestic manufacturing may not be bankable. This space certainly merits more investigation bespoke to Sri Lanka.

But just as we build our solar castles, we must also ground them. It is critical to crowd in Sri Lankan investors from the onset. So when we invite Indian investors in, let us also require them to tie-up with domestic investors and suppliers. This will increase opportunities for real technology transfer and domestic skills building. In fact, this is critical if Sri Lanka hopes to achieve energy self-sufficiency by 2030. And instead of offering investors a blanket income tax holiday, let us offer them a lower tax base and follow-up investor aftercare services to encourage incremental investment and, if feasible, manufacturing opportunities in Sri Lanka. Why don't we open opportunities for collaboration with universities and technical colleges? Why don't we tie solar subsidies to requirements on training clean-tech engineers and expanded assembly lines? Let us study the feasibility to launch a renewable energy credit market based on current practice in India and California. Indeed, why don't we follow on India's coattails for a place in the sun on solar expansion?

⁶ GTM Research. (2012). *Solar balance-of-system costs account for 68% of PV system pricing: New GTM report*. Retrieved from <http://www.greentechmedia.com/articles/read/Solar-Balance-of-System-Accounts-for-68-of-PV-System-Pricing-New-GTM-Repo>

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