



Scaling Up Energy Storage

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P RIME MINISTER Narendra Modi made three significant announcements at the COP26 climate summit in Glasgow. First, that India would be targeting net zero emissions by 2070. Second being that India would be increasing its installed renewable energy capacity target to 500 GW by 2030 and the third being cutting down of emissions by 1 billion tons by 2030. Energy storage will have a significant role to play in this transition and we can expect opening up of huge opportunities in this area in 2022. The Indian energy sector will certainly be implementing measures towards innovating Energy Storage Systems (ESS) especially a Battery Energy Storage System.

Electricity produced from renewable sources like wind and solar is intermittent in nature and the share of renewable energy would increase multi-fold to meet our clean energy targets. This would necessitate the need of large energy storage solutions for bringing stability in our power grids. Large grid scale battery storage will help in such a sce-





nario by ensuring that the grid frequency remains in the range of 49.9–50.05 hertz (Hz).

Initiatives By The Government

Given how important energy storage is for India to achieve its climate targets, the government had announced last year that it intends to come up with a comprehensive policy on energy storage in the power sector. Among the energy storage systems, batteries have emerged as an important technology for reducing carbon emissions around the world. A Battery Energy Storage System (BESS) is a rechargeable Lithium ion (Li ion) based battery system that stores energy from solar arrays or the electric grid and provides that energy to a home or business.

In 2020, the International Energy Association (IEA) had stated that India is going to require more battery storage than any other country for its renewable energy targets. Over the past few years, the government has been working towards meeting this requirement. Last year, to develop an enabling battery manufacturing ecosystem in the country, the government had made a laudable announcement of an 18,100 crore production-linked incentive (PLI) scheme for a battery storage eco-system that involves setting up 55-GWh manufacturing capacity for advanced chemistry cell batteries. The government is also working on the world's largest grid-scale battery storage programme, including a 13 gigawatt-hour (GWh) facility in Ladakh and a 14 GWh system in Kutch.

While these measures by the government are significant, there are still some issues that are required to be addressed by our policymakers to establish an enabling battery manufacturing ecosystem in India. One of these issues is the availability of raw materials for battery storage manufacturing. The most advanced battery technology today is lithium ion batteries. But India at present has a shortage of supply of lithium. Further, Chinese state owned firms have lithium mine concessions in lithium surplus countries.

Since India's lithium requirements are going to increase in the coming years, to address this issue it is now time that the government consider using its partnerships with countries

around the world to sign long term purchase contracts for lithium and other raw materials. It can also consider investing in mining activities in these regions. This will ensure manufacturing of Lithium-Ion batteries in India and its cost will most likely reduce to less than \$100/KWh, in the next 2-3 years.


Battery Recycling Infrastructure Needed

As the number of lithium ion batteries used by India begin to increase, another issue that is still to be addressed is battery recycling. According to JMK Research estimates, the lithium-ion battery market in India is expected to increase from 2.9 GWh in 2018 to about 132 GWh by 2030 at a CAGR of 35.5 per cent. To reduce import of raw materials and ensure sustainable battery manufacturing, it is important that the government begins to invest early in a battery recycling infrastructure in India. It should also consider devising suitable

policies for battery recycling that results in development of a circular economy of manufacturers or new enterprises involved in battery recycling in the country.

While as of today, Li-ion is the most promising solution, there is huge focus both, by the government and the industry on innovation on alternate chemistries for battery storage. Green hydrogen will eventually be the most sustainable solution as far as energy storage is concerned which today is not economically viable.

We are expecting pilot projects in coming years and disruptions are bound to happen in technologies around battery storage and hydrogen which will contribute to our mission of being self-reliant and making India truly *atmanirbhar*.

India has been relying on imports of oil, solar PV and batteries. Creation of an enabling energy storage ecosystem in India will contribute significantly to India's economic growth and also provide employment opportunities to millions of people. With the right policies and collaborations through public-private partnerships, it is evident that in the new decade, India will emerge as a global leader in renewable energy. 



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