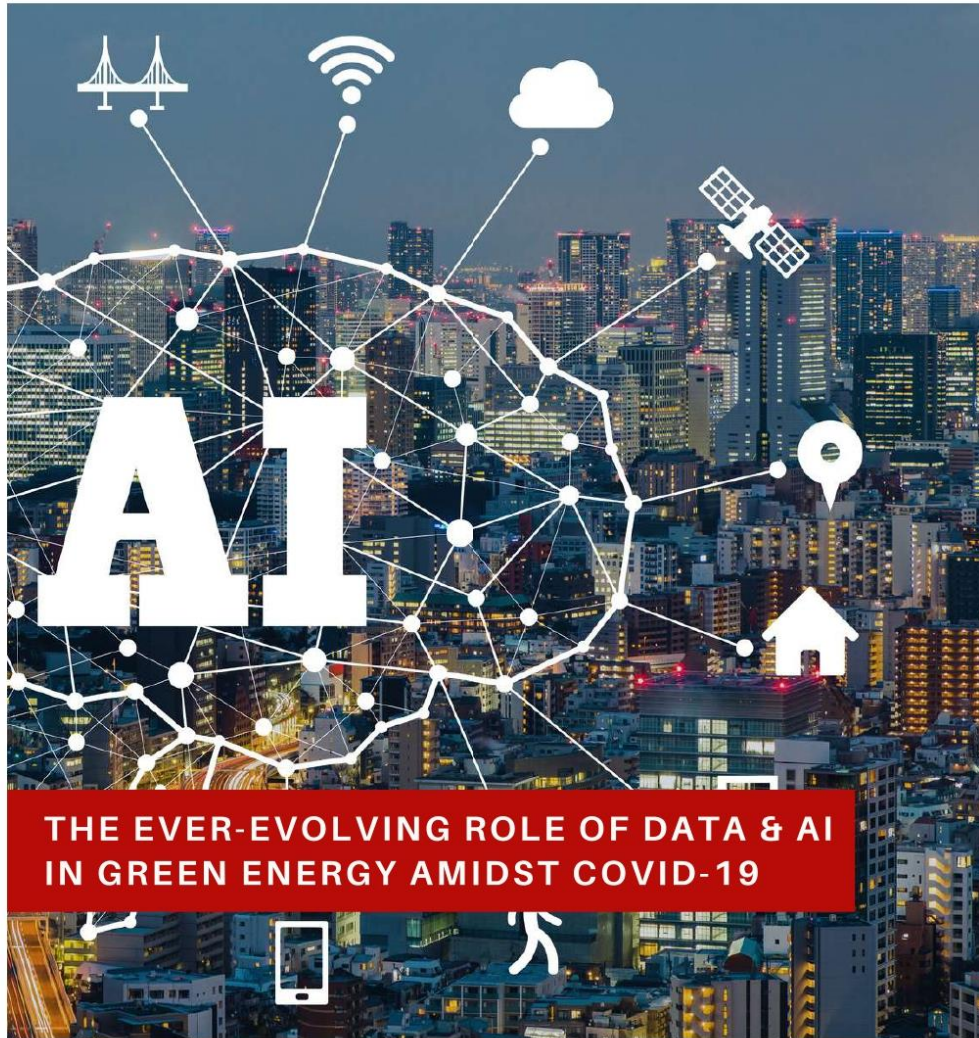


## PERSPECTIVE



### Prelude

The Covid-19 pandemic is having a major impact on energy systems around the world, curbing investments and threatening to slow the expansion of key clean energy technologies. The world is moving towards digitisation. The pandemic has reinforced the value of digitisation in our lives. Keeping in line with this trend, a lot of verticals in the economy are moving to upcoming technologies like Data Analytics, Artificial Intelligence (AI), Internet of Things, etc. One of these verticals is the power sector. AI has the potential to cut energy waste, lower costs, and accelerate the use of clean renewable energy sources in power grids globally, along with improving the operation, maintenance, control, planning and plan execution of power systems. AI is thus closely tied to renewable, clean as well as affordable energy that is necessary for development.

The renewable energy sector has a bright future with the advent of AI-managed smart grids if implemented well. AI and machine learning have become important technology solutions as the industry is constantly looking for ways to cater to the rapidly increasing demand for clean, cheap, and reliable energy. These advanced technologies have the potential to analyze the past, optimize the present, and predict the future. This means that AI and ML have the potential to solve most of the challenges that currently prevail.

*Let's read more on the Ever-evolving Role of Data & AI in Green Energy Amidst COVID-19*

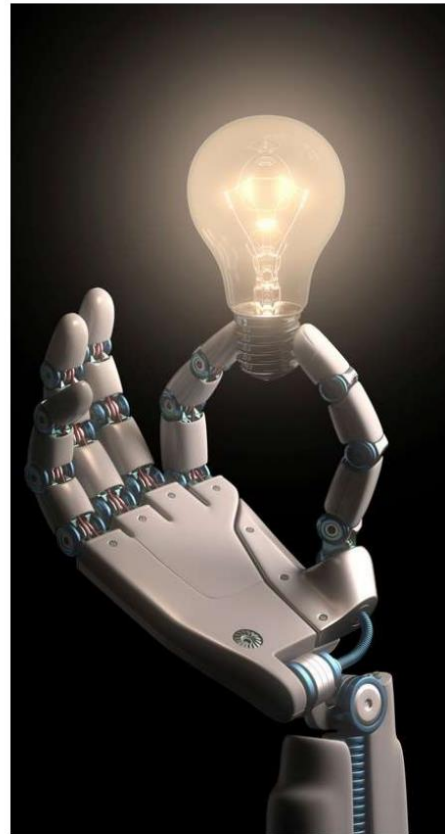


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The Covid-19 pandemic has forever altered the ways of doing business and sharpened the focus on everything ‘remote’. Renewables-based energy (RE) projects, by their very nature, have almost always been remotely located and built with smart machines that operate with remote monitoring. Their importance has been underlined more strongly than ever by the pandemic. The chances of India achieving its target of installing RE generation capacity of 450 GW by 2030 can be improved greatly by using technology to integrate RE into the grid seamlessly and efficiently. Data-based and AI-enabled technologies have already been in use to enable the development and operation of RE projects; their role now needs to evolve to cover the entire value chain of the power sector.

SCADA-based systems have been used by RE developers and operators for decades. Historically, RE projects have relied on weather data to predict the future and then operate in the hope of these predictions playing out. This made them vulnerable to variances in resource availability. Now, however, RE projects leverage the power of data and AI on a continuous basis to make more solid predictions and guide their decisions. Meanwhile, the continuous physical monitoring of assets in remote locations is enabled by technology platforms that are also capable of carrying out data-based predictability analysis to anticipate operational problems.

Today, data analytics and AI tools are primarily being used to optimize the performance of assets. However, they can also prove very useful in integrating complex hybrid RE projects, meeting regulatory compliances on forecasting and scheduling, and meeting grid compliances.



Short-term applications of data analytics and AI	Medium-term applications of data analytics and AI	Long-term applications of data analytics and AI
<ul style="list-style-type: none"> <li>• Digital data mapping</li> <li>• Asset performance monitoring</li> <li>• Periodic maintenance planning</li> </ul>	<ul style="list-style-type: none"> <li>• Integration of complex projects - hybrid projects, energy storage, and other energy applications</li> <li>• Predictive maintenance</li> <li>• Real-time market operations</li> </ul>	<ul style="list-style-type: none"> <li>• Real-time integration with allied business areas</li> <li>• Real-time network control</li> </ul>

An effective data platform must have specific features, including but not limited to:

- segmentation of data/results on both macro and micro issues to enable quick decision-making. Data and results should tie in with the targeted objectives, with quantitative analysis on increased revenue or cost savings.
- asset monitoring (setting up Asset Performance Management practices to achieve better predictability of asset condition and recommend condition-based preventive maintenance).

Given its dependence on variable resources, RE simply must leverage technology to take on the lead role in India's energy mix. The grid is the link between the generators and consumers of energy and should therefore be stable. As policies for and expectations from the RE sector evolve, the entire value chain - generation, storage/transmission/storage, and consumption - will benefit from smart technology in making the grid truly ‘clean’. Technology, backed by data analytics and supported by AI, will play a significant role in making RE the mainstay of India's power mix. To achieve India's RE targets, the entire value chain will have to recognize this fact and make appropriate interventions - the sooner the better.







