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But as renewable sources, such as solar and wind, are associated with fluctuating output, viz they generate electricity only when the sun is shining or the wind is blowing, energy storage will be able to streamline the supply from these sources to provide reliable output from the grid to match demand.

According to a key executive of OPWP, the energy storage investigation is a key part of a Resource Options study that has been recently commissioned by the state-owned entity -- part of Nama Group (formerly The Electricity Holding Company).

"We have just launched the Resource Options Study -- something we do every 3 or 4 years -- but this one is very much focused on looking at what stage is the technology for storage and how we may be able to utilize it, how much does it cost, how does it operate, and so on," said Brian Wood, Planning and Economics Director -- OPWP. "We will look at different kinds of storage -- whether batteries, thermal storage, pump storage, and so on, and how we may utilize them in Oman on a cost effective basis."

The study, due to be completed by March-April 2019, will enhance OPWP"s understanding of the use of energy storage technologies in providing reliable and sustainable electricity supply as the Sultanate makes an aggressive push towards renewables to supplement gas-based power generation. A raft of large utility scale solar PV and wind farm projects, offering around 2.6 gigawatts of capacity, is lined up for procurement over the next six years as OPWP races to meet a government-mandated target of a minimum 10 per cent of total electricity output coming from renewables by 2024.

"The findings of the study will definitely influence our plans at least over the long-term," said Wood. "Certainly, we will have a need for energy storage, and we want to utilize it in the best way we can."

The Resource Options Study, the official said, will include both generation and storage technologies. "It will give us an understanding about the status of the technology, not just today but say 5-10 years from now, so we can develop our plans accordingly."

With energy storage, a country like Oman can save on investment in network reinforcement, reduce the need for conventional generation, maximize the use of low carbon, inflexible generation, and optimize the balancing of the grid on a minute by minute basis, according to experts.

The US alone has around 33 gigawatts (GW) of energy storage capacity, equivalent to around 50 typical coal power plants. Pumped hydroelectric storage accounts for the bulk of this capacity. When demand for power is low at night, pumped hydro facilities

Other storage technologies in use elsewhere around the world include Thermal Storage. Here, Concentrating

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Solar Plants (CSP) capture heat from the sun and store the energy in molten salts or other fluids. This stored energy is later used to generate electricity, thereby enabling the use of solar energy even at night.

Battery storage is gaining popularity around the world as well, especially as technological advancements make possible large-scale storage. Current models typically use sodium-sulphur, metal air, lithium ion and lead-acid.

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