Green energy storage solutions

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According to Claudio Spadacini, Founder and CEO of Energy Dome, "one of the ...

By Katharine Rooney

In its recent tally of what it will take for the world to reach net zero, the consulting giant McKinsey describes a "fundamental transformation of the global economy" - one that requires investing just over $9 trillion a year for decades. Decarbonizing the energy supply is a significant and complex part of the transformation. We"ll need a range of solutions, including energy storage, which has emerged as a priority in recent years, a companion to the widespread use of renewables and the expansion of local electricity grids.

We"ll also need a lot more storage. In fact, for the world to remain on track to meet the UN Sustainable Development Goals (SDGs) on energy, the sector needs double-digit growth, according to the International Energy Agency (IEA), because of storage"s ability to compensate for the intermittent nature of renewable sources and to respond rapidly to fluctuating demand.

Energy storage growth should come from four technologies, each offering a different path to net zero.

Renewable energy can be converted to hydrogen, stored until it is needed, and then reverted to electricity on demand.

TheAdvanced Clean Energy Storage Projectin Delta, Utah,aims to be the world"s largest renewable energy storagefacility, helping decarbonize portions of Utah and California.

One of hydrogen"s advantages is its scalability, particularly as an enabler of long-term seasonal storage. In the western states, for instance, there is often a large renewable energy surplus in the spring, when a combination of strong winds, sunlight and cool temperatures can lead to an excess equal to hundreds of thousands of megawatt hours.

In Utah, Mitsubishi Power, a power solutions brand of MHI, is a partner in the Advanced Clean Energy Storage Project, where utility scale green hydrogen will be produced and stored in underground salt caverns. The project aims to be the world"s largest renewable energy storage facility, capable of helping decarbonize portions of Utah and California.

Elsewhere, east of the British Isles in the North Sea, vast offshore wind farms often generate excess energy. There are already a number of projects in development to harness that energy, including the Hamburg Green Hydrogen Hub in Germany, which will produce hydrogen from wind and solar power.

The Hydrogen Council, a global partnership consisting of nearly 100 leading companies, says that hydrogen could enable the widespread deployment of renewables by converting and storing more than 500 terrawatt-hours (TWh) of electricity.

Power-to-fuel technology enables excess energy from renewable sources to be stored as synthetic fuel, such as methanol, which can be produced from green hydrogen and captured CO2. That makes it a net carbon-neutral fuel, for which demand is growing rapidly: The global methanol market is expected to have a compound annual growth rate of 4.6% to 2027.

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