Renewable energy storage sri lanka

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When compared with other commodities, energy stands out because the demand for energy is required to be met at the particular instant of that demand being created. In essence, this means that there must be a large resource which can be accessed quickly and delivered to the point of demand in required quantities. This is more or less true for fossil fuels and biomass, where large volumes of fuel can be accumulated and kept ready to meet the varying demand. With renewable energy, this has not been the case, as it occurs in different times and varies a lot with time.

The energy storage market is set to explode globally, with the unfolding energy transition. The surge is such, the market for these devices are expected to grow over 40% annually in the coming decades.

There are various types of ESS. The most prevalent technologies are pumped hydro, batteries, thermal, compressed air energy storage (CAES) and flywheels. In the USA alone, almost 93% of energy storage is pumped storage.

In a CAES plant, air is compressed and stored under high pressure. This compressed air is stored in an underground cavern. When electricity is required, the pressurised air is expanded in an expansion turbine, driving a generator for power generation.

Large scale thermal energy storage like underground thermal energy storage and a system based on phase change materials named as latent heat storage, fall under the category of thermal energy storage systems (TESS). The common thermal storage systems like borehole TESS, aquifer TESS, tank TESS and pit TESS are examples.

The flywheel ESS is at present, an upcoming candidate among ESSs, since it can offer many advantages as an energy storage solution over others. It is stores the kinetic energy in wheels rotating at high speeds. Flywheels are known for their high lifecycles, long operational life, high power density, high round-trip efficiency, low environmental impacts and its capability to store mega joule levels of energy.

The most promising ESSs in grid scale operations is seen as the flow batteries or more commonly known as redox batteries. These batteries can have quite long life and cost less than most other ESSs. Another advantage of these batteries is the ability to decouple power and energy rendered by the devices.

The Government of Sri Lanka envisaged developing New Renewable Energy technologies to reach a 10% target in power generation by 2016. This target was successfully achieved a year ahead in 2015. Currently the overall goal is to reach 70% of electricity generation by renewable energy, the larger portion of which would comprise of NRE (which excludes existing large scale hydro power projects).

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Renewable Energy Resource Development Plan 2021-2026 is going to be published through a gazette notification under the provisions given in Section 8 of the Sri Lanka Sustainable Energy Authority Act.

Renewable Energy Resource Development Plan focuses the implementation of large-scale renewable energy projects. The projects that have been developed in the past periods, i.e. through feed-in tariff scheme at the initial stage and through competitive bidding at later stages, are of the capacities upto 10 MW connected to the national electricity grid at the medium voltage (33 kV) level. In the Renewable Energy Resource Development Plan, projects in the range of 100 MW capacity have been mainly focused, which are to be connected to the grid at high voltage level (132 kV, 220 kV).

In addition to the land-based large-scale projects, off-shore wind power potential and floating solar power potential have also been included in the Plan. Wave energy resource potential has been focused as an emerging energy source in the country.

Planned Energy Park projects for the project development period 2021-2026 have been included in the Plan. It is expected to review and update the Plan once in 3 years.

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