Can solar power power the Nepalese energy system?

Nepal has vast low-cost off-river pumped hydro-energy-storage potential, thus eliminating the need for on-river hydro storage and moderating the need for large-scale batteries. Solar, with support from hydro and battery storage, is likely to be the primary route for renewable electrification and rapid growth of the Nepalese energy system.

Can pumped hydro be used to store energy in Nepal?

For several hours, overnight and seasonal storage, pumped hydro is much cheaper. Batteries and pumped hydro are complementary storage technologies. Hydrogen production in Nepal is unlikely to be significant. Hydrogen or hydrogen-rich chemicals such as ammonia could be used to store and transport energy in Nepal.

How much hydro storage is needed in Nepal?

The Global Pumped Hydro Storage Atlas [42,43]identifies ~2800 good sites in Nepal with combined storage capacity of 50 TWh(Fig. 6). To put this in perspective, the amount of storage typically required to balance 100% renewable energy in an advanced economy is ~1 day of energy use . For the 500-TWh goal, this amounts to ~1.5 TWh.

Why should we study pumped storage systems in Nepal Himalayas?

Nepal Himalayas provide an ideal testbed to study pumped storage systems given high topographic gradients, large flow fluctuations, and prevalent energy demand patterns.

Does Nepal have a potential for off-river hydro storage?

Nepal has enormous potentialfor off-river PHES. The Global Pumped Hydro Storage Atlas [42,43]identifies ~2800 good sites in Nepal with combined storage capacity of 50 TWh (Fig. 6). To put this in perspective,the amount of storage typically required to balance 100% renewable energy in an advanced economy is ~1 day of energy use .

Could hydrogen be used to store and transport energy in Nepal?

Hydrogen production in Nepal is unlikely to be significant. Hydrogen or hydrogen-rich chemicals such as ammonia could be used to store and transport energy in Nepal. However, this is unlikely to occur because the efficiency is very low compared with those of batteries, pumped hydro and thermal storage, which unavoidably



translates into high costs.



Electricity from alternative energy sources like Solar and even wind can be used in the Pumped Storage scheme to eliminate the requirement of battery and to address peak energy demand in the country. Reference:

Every year WECS collects national level fuel wise energy data from different energy related organizations like Nepal Electricity Authority (NEA), Alternative Energy Promotion Centre (AEPC), Department of Mines and Geology, Ministry of Forest and Environment, Ministry of Agriculture and Livestock Development, Nepal Oil Corporation, Department of



Due to fluctuation in energy production from hydropower plants, the existing plants in Nepal cannot meet the current demand of energy resulting in the power cut during peak hours. Therefore, there is a dire need for an energy storage unit that can meet the surplus demand of





Utility-Scale ESS solutions

4 ? The project, which will be Nepal's third storage type, is 150 km west of Kathmandu on the Seti river near Damauli in the Tanahun district. The project will be one of Nepal's biggest storage-type projects, with an estimated annual energy generation capacity of 587.7 GWh for the first 10 years and 489.9 GWh from the 11th year. During the

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This Nepal Energy Outlook 2022 is developed with joint effort from Kathmandu University, Institute of Engineering, Nepal Energy Foundation, and Niti Foundation. The document summarizes the current national energy scenario, policy provisions extended by Government of Nepal, issues & gaps, and the potential recommendations to mitigate the gap.



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