

Grid-scale energy storage indonesia

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With the support of the Australia Indonesia Centre we have identified 657 potential sites across Bali for pumped hydro energy storage (PHES), with a combined potential storage capacity of 2,300 Gigawatt-hours.

Pumped hydro energy storage is a technique to store energy produced by electricity generation. Using electricity generated from renewable energy such as solar power and wind, the potential sites for PHES that we identified in Bali would be enough to support a 100% renewable Indonesian electricity grid and more.

Solar photovoltaics (PV) and wind are now the leading electricity generation technologies being installed worldwide each year. Gas and coal are in third and fourth spots respectively. PV is accelerating away from other energy generation technologies because it's cheaper, scalable and produces no greenhouse gas emissions, and because there is vast availability of sunshine.

Indonesia has large solar potential because of its tropical location. Much less than 1% of Indonesian land would be required to produce all of the nation's electricity using PV. About half of the panels would be on the roofs of buildings. Although Indonesia has only a small amount of PV at present, exponential growth can change this quickly - as happened in Australia, China and many other countries.

Because of its equatorial location solar energy does not vary much throughout the year, unlike in higher latitudes. PV (and wind) are now economically competitive with new-build coal and gas in Indonesia.

The Australian and Indonesian electricity systems are of similar size. In Australia, effectively all new generation capacity is PV and wind, and no new coal power stations are ever likely to be built. PV and wind are replacing old coal power stations as these are retired. About 4.5 Gigawatts of new PV and wind will be installed in Australia in 2018, compared with peak demand of 35 Gigawatts.

Although PV and wind are variable energy resources that depend on the local weather, the approaches to support them to achieve a reliable 100% renewable electricity grid are straightforward:

provide energy storage in the form of pumped hydro energy storage (PHES) and batteries, coupled with



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demand management

provide strong interconnection of the electricity grid between regions using high-voltage power lines spanning long distances. This smooths out adverse local weather, greatly reducing the amount of storage needed.

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