

PROJECT DEVELOPMENT ACTIVITIES FOR KIDSTON STAGE TWO HYDRO-SOLAR PROJECT

Lead organisation: Genex Power Limited

ARENA funding: \$5.0 million (up to \$4.5 million convertible)

Total cost of activities: \$12.8 million

Location: Kidston, QLD

With support from ARENA, the world's first integrated solar and pumped hydro project is being developed by Genex Power in Kidston, Queensland. That support has been provided in three stages: \$4 million towards a \$6.2 million feasibility study for the pumped hydro energy storage (PHES) component, \$8.9 million towards the \$126 million Kidston Stage One solar farm (as part of ARENA's LSS round), and \$5 million to help the combined project reach financial close in 2018.

The hybrid solar and hydro project, known as Kidston Stage Two, is expected to comprise a 250 megawatt pumped hydroelectricity storage facility using two decommissioned mine pits and a 270 megawatt solar farm. It will be capable of generating around 783 gigawatt hours of renewable energy each year, which is enough to meet the average annual power needs of 140,000 Australian homes.

The project will demonstrate the benefits of a solar PV and PHES hybrid generating reliable, dispatchable and affordable renewable energy. The PHES will also be able to provide stability and support to the grid, including FCAS.

In addition to repurposing two decommissioned mine pits for the pumped storage component, the project developer Genex is using infrastructure left from the previous mining operation to save time and money as well as minimise any environmental impact. These include the mine's accommodation camp, airstrip, road access and an electricity substation and transmission line.

WHAT IS DISPATCHABLE ENERGY?



Dispatchable energy is electricity that can be made available - or dispatched - by a power generator or energy system whenever it is needed, or switched off when it is not needed. It can also include batteries (large and small) as well as demand response, where energy customers can be paid to reduce their electricity use during peak times or emergencies.

Dispatchable energy systems that can respond very quickly to changes in the grid are also known as flexible capacity.

In addition to meeting spikes in demand for electricity, dispatchable energy can help to smooth out electricity supply when the amount of renewable energy in the grid increases or decreases.

Australia's energy future will involve increasing amounts of variable renewable energy, increasing the importance of flexible capacity in stabilising the grid.