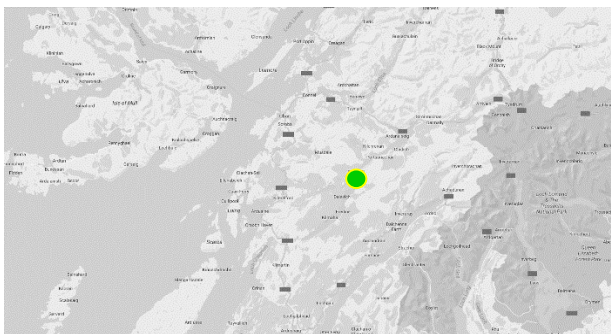


## Project 1015 - Cruachan II

Up to 600MW pumped storage facility at Cruachan, Argyll, Scotland



Boundary	UK - Scotland
Promoted by	Scottish Power

### Project Details

Commissioning Date	2025
Type of Storage	Pump Storage
Max Active Power (MW)	600
Storage Capacity (GWh)	7.2

### Storage Analysis

Cruachan II is a proposed reversible pumped-storage hydroelectric power station which would be located west of Dalmally on the banks of Loch Awe in Argyll and Bute, Scotland adjacent to the existing Cruachan hydro-electric pumped storage generating station.

Cruachan II would generate up to 600MW of electricity, using water from an upper reservoir on Ben Cruachan to drive the turbines. The turbines to be used at Cruachan II, would operate both as pumps and generators, which would be housed in a new cavern located within Ben Cruachan.

Cruachan II would go from standby to full production very rapidly, thus it could be used to deal with periods of peak demand on the grid, and intermittency of renewables.

Cruachan II power station would support effective energy management in the market by minimizing changes in output from conventional generating sets by in effect, storing the excess generated electricity when demand is low.

As a pressing energy issue is the fact that there is not enough capacity to store electricity. To meet global climate change targets it is necessary to double the current levels of renewable energy capacity. In order to make the most of those renewable energy generation, there is need for more storage capacity such as Cruachan II to be rapidly delivered.

Pumped storage hydro is the most cost effective form of large scale electricity storage, and Scotland has the landscape and resource potential to deliver a new generation of projects.

### Additional Information

Scotland's National Planning Framework 3 (2014) (NPF3) has recognised that increasing the capacity of pumped storage hydro-electricity can complement Scotland's ambitions for more renewable energy capacity.

The NPF3 has identified a new pumped storage facility at Cruachan as a national development.

Initial engagement with key stakeholders (local and central government, various NGOs) has been positive.

### General CBA indicators

Cost [Meuros] 688

Scenario specific CBA	EP2020	Vision 1	Vision 2	Vision 3	Vision 4
B2 SEW (MEuros/yr)	<10	<10	40 +/- 10	40 +/- 10	40 +/- 10
B3 RES integration (GWh/yr)	<10	<10	370 +/- 70	460 +/- 90	370 +/- 70
B4 Losses (GWh/yr)	<10	<10	<10	<10	<10
B4 Losses (Meuros/yr)	<10	<10	<10	<10	<10
B5 CO2 Emissions (kT/year)	-100 +/- 100	400 +/- 100	500 +/- 100	-300 +/- 100	-200 +/- 100

### Capability for ancillary services

The plant will be able to provide the following services:

- (i) Balancing Mechanism (Bid & Offer instructions delivered within 60 seconds);
- (ii) Frequency Response (Primary, Secondary, High); (iii) Reactive Power (MVar Lead & Lag);
- (iv) Reserve Services (Spin-Gen, Spin-Gen with Low Frequency Relay, Spin-Pump, Spin-Pump with High Frequency Relay, Pump De-Load, Rapid Start); (v) Black Start.

As the project is based on the storage technology, it can also contribute to the power and frequency control and earn revenues that are not valued in this assessment This storage project of UK - Scotland enables saving in generation capacity of 19 - 24 Meuro/year

### Complementary Information

This additional information has been provided based on a preliminary version of the CBA 2.0, in coordination with the European Association or Storage of Energy (EASE). Each of the four below KPIs are scored from 0 to ++ based on the technical characteristics provided by each project promoter.

Response time to activate Frequency Containment Reserves	+
Response time to reach the available power	++
Total time during which available power can be sustained	++
Power that is continuously available within the activation time	++