

## **CARES PCI**

### **Annual Report – March 2018**

CARES PCI is a single project consisting two adiabatic Compressed Air Energy Storage plants in Cheshire, one each at 40MW / 200MWh and 500MW / 2.5GWh. The project was approved as a PCI in November 2017.

#### **Original Plan**

The plan, accepted by ENTSO-E, is that the smaller plant would take 3 years from financing to operation, and the larger one 7 years, variable depending mainly on the time required for new grid connections. The timescales are determined by both grid connection lead time and planning lead time; other than that, construction timescales are roughly 2 years for each plant – a bit less for the smaller one and a bit more for the larger one. The larger one was to start at least 6 months after the smaller one, to benefit from the lessons learned.

Because the system does not permit conditional completion dates, the dates in the system are 2022 and 2026 respectively. The two plants are accepted as a single project because construction of the larger plant cannot be funded commercially before the smaller one is operational.

#### **Progress: Funding**

In the four months since PCI approval, Storelectric has received some funding but not enough to trigger the start of the above timescales.

The funding we have received has enabled us to proceed with extended habitat surveys for the smaller plant. They are not yet complete, but so far they have shown little wildlife and few habitats, fewer than expected, which is a good result for our future planning application and construction work.

#### **Progress: Technical Validation**

We are part way through the technical validation, which has three main elements:

1. Dynamic modelling by Fortum AG using their proprietary Apros ® dynamic modelling system (designed and built for the power generation industry) to model the system and a number of variants;
2. Static modelling by Costain plc using static analyses of the main embodiment and numerous sensitivity (what if...) analyses, and summarized the their findings in combination with the report from Fortum and the previous analyses undertaken by Siemens AG and Oswald Consultancy Ltd;
3. Geotechnical feasibility study for converting the 40MW caverns from use as ethylene storage (the ethylene has recently been successfully cleaned out from them using solution and vacuum cleaning techniques) to compressed air storage at similar (slightly higher) pressures, using data from the land-owner who is offering to lease to us both the caverns and the land above.

**Grid-scale electricity storage**  
using an innovative form of  
**Compressed Air Energy Storage**



The two modelling exercises are being performed on a 40MW plant because (a) the 500MW is largely just a scaling-up of the 40MW; (b) the smaller plant would be the first built; and (c) we have comparable analyses from Siemens (based on actual Siemens equipment and well-experienced estimates for the balance of plant) and Oswald (based on standardised equipment data). Others have reviewed the 40MW plant with similar conclusions, but not produced publishable results.

All three validation elements have yielded satisfactory results so far, in line with expectations and the prior two analyses. Their final reports are still being written.

**Progress: Planning**

We have shown some initial wildlife/habitat survey results to the local council, who is the planning authority for the smaller plant and a very important statutory consultee for the larger one. They have responded very positively to the interim results, asked us to undertake another two studies (which we have commissioned) and stated verbally that there are no show-stoppers apparent at this time. We expect to apply for a screening opinion in late summer / early autumn, after completion of the surveys and some rendition drawings of the plant.

**Progress: Other**

We have set up the website, [www.cares-pci.uk](http://www.cares-pci.uk).

We continue to provide all the data requested by ENTSO-E and the European Commission, and to attend the appropriate webinars, meetings and consultations.

We continue to liaise with National Grid, Ofgem and other relevant bodies in the UK regarding the need for balancing services in the UK.

We are commissioning reports into the energy transition in major EU countries, and a separate review of revenue streams.

**Schedule Review**

Assuming that we are awarded a CEF Study grant, contracted by June 2019, and a 40MW Works grant to follow on directly one year later, then the revised dates for the two plants to start trading are:

- 40MW: July 2022
- 500MW: January 2027