EPL BESS HEARING: SUBMISSION – FINAL

Sir, good morning and thank-you for the opportunity to address this hearing.

I am here today primarily to speak on behalf of Sir Christopher Edwards, the Chairman of the Heat Vault Company Limited, who sends his apologies for not being here in person, as he is out of the country on Heat Vault business.

Christopher's contribution to this hearing is an overview of an energy storage system by the name of Heat Vault, which sits within the context of 'long duration energy storage', the adoption of which according to a recent Government report would shave £24 billion from the UK's power system costs.

As the name suggests, Heat Vault stores energy in the form of heat, beneath the surface of the ground in solid rock, a place where heat has been stored naturally for billions of years. An initial geological assessment undertaken last year foresaw no barrier to such a facility in the Aldington area.

Heat Vault storage is created by the drilling of a number of wells, typically to a depth equal to the height of an average seaside cliff face. Energy generated from wind or solar is turned into heat using novel technology and stored in these wells. On demand the process is reversed, with the heat converted into electricity using a steam turbine.

It is reasonably clear that EPL envisage that batteries will form the basis of the energy storage system and the Battery Safety Management Plan states that the assumed type of battery will be lithium ion. A format which justifies closer inspection.

First of all, in the context that the worldwide level of demand for energy storage will very soon far exceed the ability of a finite

material such as lithium to provide a battery storage solution. Potentially in the projected lifetime of Stonestreet Green Solar.

In this context, we need also to think about the demand and supply factor in the worldwide competition for supplies of lithium. Consider in this context what is going on right now as Donald Trump attempts to secure rights to Ukraine's lithium resources which represent one third of Europe's total.

We need also to consider the short-term storage capabilities of lithium on the one hand and on the other the durability of lithium batteries, wherein their projected lifecycle will require periodic renewal of the batteries over the lifetime of the project.

Such renewal also compounds the high carbon footprint of lithium, not only in manufacture but also transportation, given that lithium mining is focused in southern hemisphere countries such as Australia and Chile.

Consider also the complexity of the recycling process, and the associated expenses; currently, just 5% of lithium-ion batteries are recycled. Surely of great significance to any business that likes to promote its green credentials.

In which context we need also to consider the working conditions in which materials such as lithium are extracted.

You've heard earlier about safety issues and risks related to fire and toxicity, but the final comparison I wish to draw with lithium batteries concerns their cost. There is an established metric by the name of Levelized Cost of Energy (LCOE) that estimates the average cost of generating electricity over the lifetime of a power plant. It's used to compare different energy generation methods and to help decide whether to invest in a new energy project.

Included in this metric are capital costs, operating costs and financing costs. Against this metric, were lithium scored at 100,

Heat Vault generates a score of .6 – yes that's 0.06% or around 1/200th, depending on your mathematic preferences.

In western Sweden, the first full scale Heat Vault has been built with an initial capacity of 1GWh, which equates to 1000 megawatt-hours (MWh). As a measure of its storage effectiveness, heat stored last October had the same values when measured this month. This is both a global first and a test-bed site for various developments. It is also a showcase to allow interested parties to view the structure first hand, which has already received its first commercial visitors.

As a working site, a variety of optimisation tests have been performed with results exceeding expectations in terms of energy input, storage and outputs. Both electrical and thermal fluid inputs have been evaluated.

The site is currently undergoing further developments to link the energy storage with both inclined and vertical solar PV. So, its suitability for the kind of project that Stonestreet Green represents will shortly be established.

Thank-you for listening.

ENDS

26th February 2025