

HIGHVIEW POWER STORAGE

Highview Power Storage,
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Operating the Electricity Transmission
Networks in 2020 Consultation

National Grid

11th August 2009

Dear Sir,

Operating the Electricity Transmission Networks in 2020 Consultation – Response from Highview Power Storage

Thank you for providing Highview Power Storage with the opportunity to comment on the above consultation document.

The consultation document is very comprehensive and we are glad to see the recognition of the role of energy storage technologies in the future operation of the grid.

We would like to give our detailed views on Question 38 from the consultation document.

Question 38: Are there further aspects of storage or other storage technologies we should consider when looking forward to 2020?

Highview is a UK company developing proprietary economic and commercially viable industrial and utility scale clean power/energy storage (CTT), using liquified air (a cryogen) as the storage medium. The technology is suitable for a variety of large-scale energy storage applications, including black start. The technology can simultaneously convert waste heat (including low grade) to power.

The Company is led by Gareth Brett, a veteran of the Independent Power Sector. Most recently he was Head of New Nuclear Development for British Energy.

THE BASICS OF THE TECHNOLOGY

Liquified air (cryogen) can be stored easily at atmospheric pressure in an insulated vessel – it just needs to be kept cold (-196°C). At normal ambient temperature, it regasifies: 1 litre of liquid air delivers about 700litres of gas when regasified.

To function as an energy storage device, (i) air is liquified through a liquefaction plant using excess or off-peak electricity; (ii) this is then stored in insulated tanks and (iii) on demand, is re-gasified under pressure to drive a turbine.

Our inventive step: Highview has designed a fully integrated system which enables the cold to be recovered from regasification, stored and re-used within the liquefaction process to reduce the energy cost of liquefaction. This achieves a quantum leap in efficiency, offering the prospect of commercially valuable storage (predicted: >50%; ~60% at utility scale).

Marketing:

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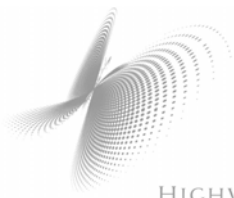
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Highview Power Storage is the trading name of Highview Enterprises Limited

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OUR STAGE OF DEVELOPMENT

We have been through a three year scientific development and validation programme. We have constructed a successful laboratory scale model and concluded a significant due diligence programme with independent technology experts.

A first field CTT pilot plant (500kW nominal power rating, ~4MWh of storage) will be hosted by a leading UK energy company at a Greater London generation site later this year (full testing Q1/2 2010). Embedded in the Grid (fully compliant), it will validate (i) the inventive steps and (ii) the integration of all key components, including safety and control systems. It will be one of the largest new technology energy storage systems deployed.

TIMELINE TO DEPLOYMENT

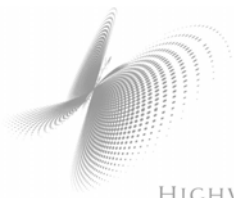
The pilot will be used to (i) evaluate and optimise the technology in the field; and (ii) support the design and development of larger multi MW production units through 'alpha' (test facility based) and 'beta' (field deployment) development programmes.

We expect to commence the build phase of the "alpha" unit during 2010 in collaboration with an OEM partner. Thereafter we plan to deploy beta units in the field from 2011.

With an output probably in the 4-6 MW range, all components for the alpha and beta programmes are in demonstration or commercial production. The units will be packaged in standard ISO container envelopes making them easily transportable.

CTT- KEY SYSTEM ADVANTAGES include

- no combustion, no chemical reaction; no emissions - the exhaust is clean, cold air.
- assembled from components with (i) proven performance and reliability; (ii) 20+ year lifetime; (iii) competitive pricing, and (iv) pre-existing global supply chains.
- the power rating, rate of re-charge and storage capacity are independent of each other, giving system flexibility. Power rating can be up to 100's of MW's; energy storage capacity a multiple thereof.
- below about 10MW, the systems can be mobile, packaged in standard ISO containers. Above 10 MW, the systems will be fixed site. There are no geographical or geological constraints.
- suitable for 'black start'.
- theoretical efficiency at ambient temperature is ~75%. Predicted efficiency, allowing for system and operational losses, at utility scale is expected to be ~60%.



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- Capital costs are expected to be significantly lower than other storage technologies with costs at scale and volume being similar to those of combined cycle power plants (currently around £500/kW).

Should you require any further information, please feel free to contact me.

Yours Sincerely,

Toby Peters

COO

Highview Power Storage

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