The Bowman Centre
For Sustainable Energy

Hydrogen based 'Energy Storage 'Battery'

By Ed Brost

The IESO is to be congratulated for identifying the role energy storage will play in decarbonizing Ontario's electrical grid. Grid scale energy storage will enable new electricity generation, contribute to enhanced grid reliability and resiliency while reducing costs to consumers.

The P2D report identifies 15,000 MWh of energy storage to be in place by 2035. That capacity will be made available primarily by using pumped storage and chemical batteries.

However, there is another technology that would use salt caverns to store hydrogen produced in Ontario using low-carbon off-peak power. This hydrogen based 'battery' can store energy for use over time periods ranging from a few hours, or days, and even seasons. Table 1 identifies compelling advantages of a hydrogen-based battery offers over a conventional battery. A 21st century energy storage system designed, built, and located in Ontario.

There is no need to import H_2 from outside Ontario for this system to work.

The *Bowman Centre for Sustainable Energy* has been working on design and development of a hydrogen-based energy storage system for almost a decade. This short video describes this 21st century energy storage system; *Alternative Grid Scale Energy Storage*. This ***Briefing Note*** provides more detail on how the system would work .

Recommendation

Please include hydrogen-based energy storage as part of your energy storage technology portfolio. For more information on the socio-economic benefits of a hydrogen and cavern based 'battery' contact the Bowman Centre for Sustainable Energy

Table 1 - Hydrogen Based Battery compared to Conventional Chemical Battery

Features	Low Carbon H_2 Battery	Conventional Battery
Capital Cost Cdn$ (3,000 MWh)	200$ - 300$/KWh	300-400/KWh
Construction Jobs	Yes – many jobs	Yes - some jobs
Long Term Operations Jobs	Significant	Minimal
Advances Ontario's Low-Carbon Hydrogen Strategy	Yes	No
Advances Federal Hydrogen Strategy	Yes	No
Seasonal Storage	Yes	No
Enable H_2 Hubs	Yes	No
Develop Ontario/Cdn IP	Yes	No
Oxygen co-product for sale	Yes	No

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