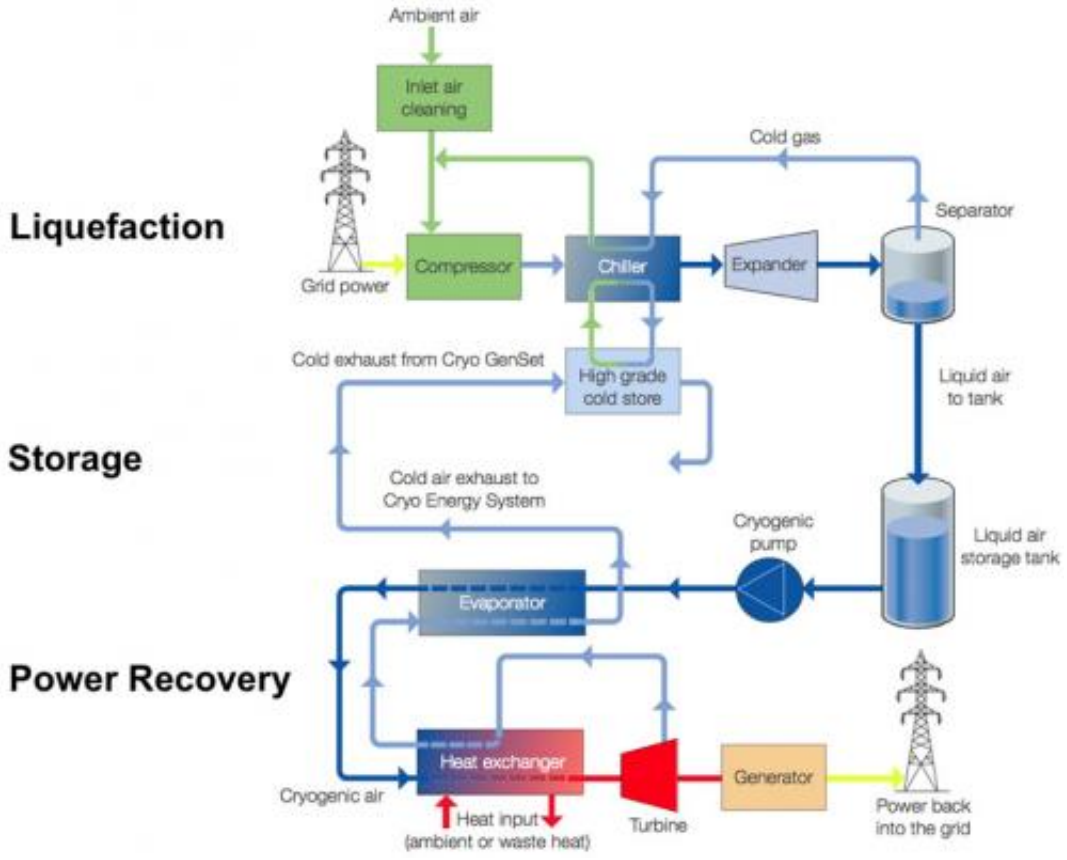
Energy companies testing "liquid air" as a means of storing backup electricity

May 22 2013, by Bob Yirka



(Phys.org) —Highview Power Storage, a British company that develops energy storage systems for utility companies has received $18 million in funding from several backers to investigate the use of "liquid air" as a

means of storing electricity for backup purposes. Liquid air is air that has been chilled to the point of liquefying—when warmed it expands, allowing for the possibility of driving turbines to create electricity.

One of the main problems with most renewable energy sources is that they can't produce electricity all the time—only when the wind is blowing, for example, or when the sun is shining. Because of that, developers have created energy backup systems. Such systems can store excess electricity for use when the primary source is unavailable. Most current systems rely on batteries, which work very well, but can become costly in the long term. Highview Power Storage is looking at using electricity from the grid to cool air till it liquefies, then storing it in huge tanks until it is needed.

The process is both simple and inexpensive. Air is pulled in from the environment, cleaned to remove C02 and water vapor (both freeze to a solid) and then chilled to -310F (-190C). The liquid is then stored in vacuum sealed tanks. When the need arises, the liquid is exposed to warm air, causing it to expand and in so doing, drives a turbine that creates electricity. The whole process has been found to be approximately 50 to 60 percent efficient, which means heating the liquid air creates just over half as much electricity as was used to chill and store it. That's not very good compared to batteries, of course, which are typically 90 percent efficient, but liquid air has other benefits. Foremost among them is that liquid air can store power for decades, while batteries need to be replaced periodically. Storing air is obviously a lot cleaner as well.

Highview Power Storage isn't the only company testing liquid air as a power source—Berkeley California based LightSail announced recently that it had raised $37 million to study the use of liquid air as a means of storing electricity. SustainX, based in New Hampshire also recently announced it had raised $20 million to do the same. In related news,

engineering giant Ricardo is currently testing the possibility of using liquid air to power automobiles, though they remove the oxygen, leaving just liquid nitrogen.

More information: www.highview-power.com/wordpress/?page_id=67

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Citation: Energy companies testing "liquid air" as a means of storing backup electricity (2013, May 22) retrieved 26 April 2024 from https://phys.org/news/2013-05-energy-companies-liquid-air-backup.html

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