CLEAN SCALABLE ENERGY STORAGE™

Tuesday 10 September 2019 ASX:14D

**NEGATIVE ELECTRICITY PRICES AND STORAGE**

- Intermittent negative electricity prices will not make energy storage economic
- Energy Security Board looking at market redesign to favour firming generation as supplied by TESS

After periods of negative electricity pricing in recent days some shareholders have asked why 1414 Degrees' thermal energy storage systems (TESSs) are not making money from these events like batteries are reputed to be doing. The Company will, in time, have that capability but, as explained below, proposed market changes would reduce these undesirable price swings by rewarding firming base load generation like that supplied by the TESS.

While the 1414 Degrees TESSs will take advantage of periods of negative electricity pricing, these events alone are insufficient to form an economic basis for investment in energy storage, including batteries and pumped hydro. These events are intermittent and disruptive so the market operators are openly looking at market changes to promote reliable firming supply.

The Energy Security Board called for submissions on market redesign on 2nd September. As mentioned in the Weekend Australian 'Call to rejig power prices to reward reliability' (7 Sept 2019), Australian Energy Market Operator (AEMO) CEO Audrey Zibelman commented, "What we're looking to do is work with the Energy Security Board, which includes all the market bodies to say 'let's talk about how we get this done as efficiently as possible'."

This acknowledges that batteries and renewable generators do not deliver the firming power supply that is provided by the spinning generators of fossil fuel power stations. Profiting from these destabilising price swings would be opportunistic and should therefore form only a marginal part of any business model for storage in the National Electricity Market (NEM).

A TESS provides the spinning inertia for electricity supply, just as the big power stations do, but with the added benefit of firming renewable sourced energy. While pumped hydro also provides firming electricity, the TESS can be built as small or large units distributed through all levels of the grid, delivering reliability irrespective of interconnector or transmission problems. Furthermore, the TESS can do this because it is designed to provide heat to industries as the base load for their stored energy, so the TESS has surplus electricity for the grid.

In summary, TESS has a much broader revenue base and can provide long-term reliable baseload electricity supply in the manner of the retiring fossil fuel stations. 1414 Degrees is currently rolling out its pilot installations to prove this in operating commercial sites.

The economic case for firming storage requires that the NEM be changed to reward the provision of firming baseload electricity supply. Instead of ensuring longer-term operation of fossil fuel power stations, the introduction of TESS would enable the transition to low or zero cost renewable supply and, remarkably, replace much of the fossil fuel used for heating, a market twice the size of electricity. Pumped hydro and batteries are useful for long term and short term supply, respectively, but are expensive and less versatile compared to TESS and cannot displace gas emissions used in the larger heat market.

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**ABOUT 1414 DEGREES LIMITED**
1414 Degrees believes in a sustainable energy future, where energy is available to all, at all times. Its clean energy storage is set to reduce energy costs by increasing the efficiency of renewable generation and stabilising grid supply. The 1414 Degrees thermal energy storage system (TESS) is unlike any other energy storage system in the world.

1414 Degrees' technology stores energy generated from electricity or gas and supplies both heat and electricity in the proportions required by consumers. It is unique in its combination of low cost, flexibility of location, scalability, and sustainability. Following the successful development of its commercial demonstrator, the Company is now in an early stage of product development and commercialisation.

For more information please visit www.1414degrees.com.au