

Wednesday 2 September 2020

ASX:14D

## Efficiency boost for 1414 Degrees TESS

- 14D planning an efficient and cost-effective alternative power plant using SiBox technology
- World-leading technology company supporting energy recovery system development

1414 Degrees (ASX:14D) is pleased to provide an update on the thermal energy efficiency of its SiBox thermal storage technology that will be used in the Silicon Power Plant proposed for its large Aurora Solar Energy Project in South Australia. It is engaging with multinational heat recovery specialist Nooter/Eriksen Inc (N/E) to maximise electricity generation from the SiBox.

SiBox, 14D's scalable silicon based thermal energy storage (TES) for its Thermal Energy Storage System (TESS), is designed to operate at very high efficiency for long periods when cycled daily, thereby providing the equivalent functionality of thermal energy from burning fossil fuel at over 90% efficiency (Figure 1). Nooter/Eriksen's involvement is to use SiBox energy to reliably supply steam generators and turbines, resulting in a heat-to-electric efficiency as in conventional fossil-fuel-fired steam turbines.

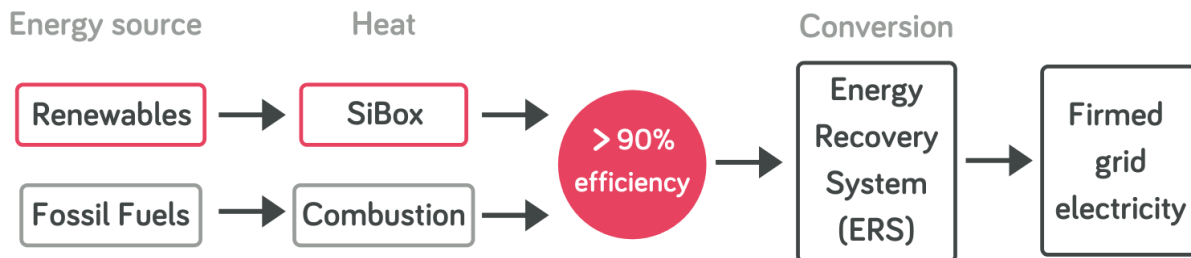


Figure 1: Key thermal power plant components for firming, synchronous generation based on steam (gas alternatives not shown).

The key advantage of our new SiBox technology is that it will enable the economies of scale necessary to provide effective long-duration storage services at low cost. Scale is also important because the electrical efficiency of turbines increases with size. We are planning to increase the scale of our technology progressively, demonstrating the performance and reliability of the SiBox and its energy conversion system at each level (Figure 2).

Additionally, there is a growing need for dispatchable synchronous generation as more fossil fuel plants are retired and the penetration of variable renewable energy generators increases. 14D’s TESS is aimed at providing a complete clean thermal technology with synchronous output for the electricity network, unlike current plans to build more gas generation.

The decreasing cost of solar PV, projected to drop to around US\$15/kW in coming years, makes SiBox competitive with fossil fuels as a source of synchronous electricity generation. This is an exciting development because the solar PV capacity of the Aurora Project can be increased as demand grows, allowing the Aurora project to expand incrementally and limit financial exposure. Hence, the benefits of the TESS technology as a value add service providing long-duration energy storage with synchronous output for grids and renewable energy farms can be progressively demonstrated at Aurora.

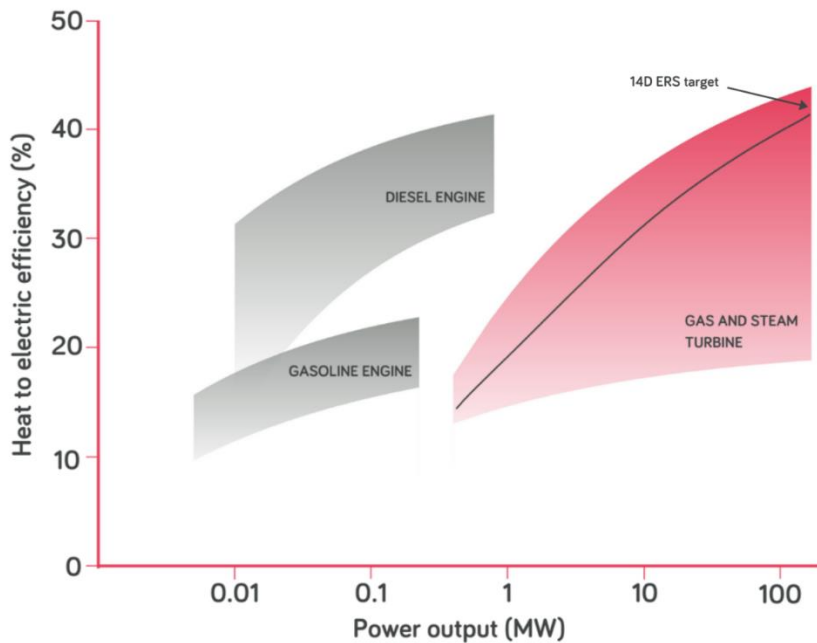


Figure 2: Comparison of efficiency at scale for different energy conversion technologies.

*About Nooter/Eriksen: N/E is the world’s leading supplier of Heat Recovery Steam Generators (HRSGs) for power generation and heat intensive industries. N/E has built and installed a full range of heat recovery systems, including many of the world’s largest natural circulation HRSGs, several producing over 580 tons/hr of steam. Complex heat recovery systems are Nooter/Eriksen’s speciality. All systems are designed for maximum reliability, efficiency and availability. The heat recovery systems for each specific application are custom designed to meet the customer’s requirements at the lowest possible cost without sacrificing quality or easier maintainability.*



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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 electrically charged TESS demonstrator, and commissioning of its pilot GAS-TESS at SA Water's Wastewater Treatment Plant, the Company is now in an early stage of product development and commercialisation.

For more information please visit [www.1414degrees.com.au](http://www.1414degrees.com.au)