



30 January 2019

ASX:14D

QUARTERLY SHAREHOLDER UPDATE

HIGHLIGHTS

- TESS can operate as baseload power station
- GAS-TESS competitive on functionality and operational costs
- Power generators seeking efficiency, lower costs and emissions reduction
- R&D focus on further cost reduction from increased scale
- TESS unit cost of energy decreases with scale
- Strong cash position
- Five new team members, including COO

1414 Degrees Limited (ASX:14D) is pleased to provide its December 2018 quarterly update.

Our first full quarter since the IPO and ASX listing has been very productive for the company. The funds from the IPO capital raising have enabled us to fast track the GAS-TESS commercial pilot at SA Water's Glenelg facility. This is our first installation in a working industrial plant where reliability and functionality are the key requirements. It is also our first opportunity to operate the TESS where both electricity and heat outputs can be used and measured. This is a further step up from the commissioning of the control systems for the TESS-IND and turbine that we reported recently. That was a very important step as it showed the systems could run for many hours with continuous electricity generation.

BASELOAD POWER

It is probably not fully appreciated that the TESS will be configured to run remotely and automatically. The TESS has the ability to store energy, then generate synchronous electricity with a turbine and heat for long periods. The GAS-TESS will burn biogas and qualifies as a baseload renewable power station while providing low cost grid scale storage.

There will be a staged process for commissioning and testing the GAS-TESS since this is the first time biogas burning in an oxygenated atmosphere has been used to charge the silicon-based heat store. It will begin with optimising the operation of the biogas burners as they charge the thermal store and power the turbine using sensible heat. Following this, the heat store will be charged in the latent heat range, making the metal molten. Both stages will provide commercial heat and power for the SA Water facility, the only difference being the density of the energy storage.

GAS-TESS EFFICIENCY VS FUNCTIONALITY AND OPERATIONAL COSTS

The GAS-TESS will be fully insulated and have all systems operational, including heat supply and integrated controls to the SA Water facility, so our engineers will be able to determine its effectiveness and efficiency under the site conditions. It should be noted that efficiency is not a prime requirement for the site or most of the industrial sites we have assessed. In many cases it is the functionality and low operational cost that is the primary consideration.

For example, the current alternative to the GAS-TESS is a reciprocating engine that is expensive to maintain, less efficient for the destruction of toxic components in the biogas and does not have built-in energy storage. Our expectation is that GAS-TESS will provide a unique and very competitive solution for waste management facilities including sewerage, landfill dumps and animal farming. This global market potential supports a high growth outlook for this product into the long term.

PROJECTS

During the quarter our engineers assessed the Abbe plant in Victoria and presented a pre-feasibility study for the consideration of management and we are awaiting their advice.

Pepe's Ducks has advised that they wish to proceed with the project after the Chinese New Year peak production period.

We continue to receive approaches from large industrial users of heat and electricity both in Australia and overseas. Power generation facilities are seeking ways to run their plants more efficiently so that they can lower costs and emissions. We have been working with them on solutions involving large grid-scale TESS delivering heat as hot air or steam, and electricity. In most cases a GWh scale TESS-GRID is required to meet site specifications.

Large consumers of gas have approached us, seeking to reduce consumption and therefore cost. It is perhaps not commonly appreciated that the refining of petroleum products, including gas, involves large amounts of heat. The CEO of Santos Ltd was recently quoted saying that their refining facilities in South Australia consume the equivalent of 5% of the gas supplied to the eastern seaboard. The continuing fall in the price of renewable generation creates an opportunity for TESS teamed with renewable generation to displace this gas, thereby significantly increasing gas availability without increasing emissions, while improving profits and preserving jobs that might otherwise be lost as industry relocates production to lower cost jurisdictions.

GRID SCALE - COST PER KWH OF STORAGE DIMINISHES WITH SCALE

The ability to scale silicon storage to large dimensions is one of the key attributes of 1414 Degrees' technology, making it highly competitive for network scale energy storage. The TESS' intrinsic design features result in increasingly lower unit costs as it scales up to GWh capacity, unlike batteries whose storage unit cost remains fairly constant with scale.

Put simply, the 1414 Degrees TESS products' cost per kWh of storage diminishes with scale.

Our plan is to build the first 40 MWh cell, charging and discharging from the electricity grid, to demonstrate its advantages while providing stability services to the National Electricity Market ('NEM'). A contract with a power wholesaler will allow us to arbitrage on the NEM, buying electricity at a low price and selling when prices are high. The device would also earn revenue from NEM fees for grid stability because its turbine has spinning inertia like a gas or coal power plant, and it could provide fast frequency response ('FFR') to grid variations by near instantaneous switching of its charging connection.

RESEARCH AND DEVELOPMENT

As we prepare to scale up our storage we are monitoring promising developments in the efficiency of gas turbines. Up to now, engineering companies have focused efficiency gains on very large turbines used in power stations. As the demand for these is falling precipitously, they are becoming more interested in producing smaller turbines that could be used in devices such as the TESS. At the same time, we are working to develop higher temperature heat exchangers to get more from our current turbines.

Our team continues to develop the technology to deliver even lower cost solutions. Once our workshop tests are complete, we intend to trial a small TESS at the Pepes Ducks hatchery focusing on heat output only. We are also designing and testing components for the much larger 40 MWh device to realise even lower build costs.

FINANCE

Our cash position remains strong. The actual expenditure on research and development was significantly less than forecast, and our cash was boosted by over \$2.5m in R&D tax refunds. We expect an increased spend in the next quarter to buy a new turbine and heat exchanger for the next TESS-IND and advance our key projects.

CORPORATE DEVELOPMENT

We have continued to strengthen the team, appointing five new staff this quarter in the areas of research, engineering and marketing. There have been some internal changes including the creation of a research group to focus the efforts of some talented engineers.

In particular, we welcome the appointment of Dr Jordan Parham as Chief Operating Officer. This is part of the strategy we announced in late 2017 to ensure a succession plan for Executive Chairman, Dr Kevin Moriarty to retire from executive management. The company now has several senior executives who are fast gaining corporate experience and becoming familiar with our innovative technology and its potential commercial applications. This strategy, to build a leadership team that understands the business, will ensure that your Company can build shareholder value from actual technological and marketing success, and decrease corporate risk.

Capital markets have been very subdued or negative during the quarter and this has affected your company along with many others. Notwithstanding, we have gained over a 1,000 new shareholders and most large original shareholdings are intact. We welcome our new shareholders and also thank existing shareholders for their support during this critical time for the company, as we build and install our first devices in sites where their full potential can be measured and realised. We expect we will make significant advances in the coming year and justify the continuing support of our shareholders.

FOR FURTHER INFORMATION PLEASE CONTACT:

Dr. Kevin Moriarty, Executive Chairman
+61 8 8357 8273

ABOUT 1414 DEGREES LIMITED

1414 Degrees is working to create 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 years of effort by the Company's engineering team and the successful development of its commercial demonstrator, the Company is commercialising its scaled up products.

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