



30 April 2024

ASX:14D

March 2024 Quarterly Activity Report

Highlights:

- Acquisition of exclusive licence for dual column pyrolysis process for hydrogen production
- \$2.5m grant awarded for new hydrogen technology SiPHyR
- \$7m SiBox evaluation program successfully concluded
- Commercialisation strategy underway
- Progress toward Aurora Energy Precinct transmission line access

1414 Degrees Ltd (ASX: 14D) ("1414 Degrees" or the "Company") is pleased to release its Quarterly Report for the period ending 31 March 2024.

Chairman's Letter

The recent quarter has been productive for the Company and for shareholders, who have seen a substantial revaluation of the Company. There are several drivers of value, in particular the conclusion of the SiBox evaluation program which increased its technical readiness level (TRL) to 7, while our Aurora renewable energy precinct has progressed with the signing of a term sheet on a process for connecting to the 275kV transmission line (announced post quarter). We expect a further revaluation from the Aurora projects when this concludes.

The Quarter also saw our Company awarded a \$2.5 million grant to commercialise SiPHyR - our new hydrogen generation technology using SiBrick in partnership with the University of Adelaide, Woodside Energy Technologies Ltd and the Royal Melbourne Institute of Technology.

SiBox technology is key to 1414 Degrees' commercial future. It offers stable energy output, high energy density for tight spaces, and decoupled charging/discharging for energy cost savings.

This quarter we showed that the SiBox charging system can provide frequency control ancillary services as well as demand response to further reduce the cost of energy for the industrial user without effect on heat output.

We are taking SiBox to the next stage of its commercial journey - building a much larger installation in a commercial setting to increase its TRL to 9. In 2019, we purchased the Aurora solar energy project (near Port Augusta) through a full acquisition of Solar Reserve Australia Pty Ltd, and obtained regulatory approval for grid scale thermal energy storage. The expected connection to the national grid will open the way for the Company to build a large SiBox system for electricity storage and generation in the National Electricity Market.

During the quarter we engaged Dr Jason Chaffey to prepare a go to market strategy for our silicon technology. The Company now has two market ready products for decarbonising high temperature industrial processing and power, and we are developing two more products for other market segments. As reported

previously, industrial decarbonisation of high temperature heat will be inhibited where electricity is more expensive energy than natural gas but there are sites where electrifying heat is now economic and we are assessing opportunities in this market over the coming months.

We envisage a key role for our silicon energy storage to make hydrogen in industries that already use gas for process heat and electric energy is uncompetitive, and have moved to acquire the appropriate technology.

During the quarter, we revealed SiPHyR - a new technology incorporating our silicon knowhow to create low emission hydrogen from methane, requiring less than 25% of the electricity needed to produce hydrogen using electrolysis. This method is expected to be more cost effective than current methods and could be used directly in factories to substantially reduce emissions without needing a massive increase in electricity supply.

Our team will be working to accelerate the \$5.2m SiPHyR development to give 1414 Degrees a significant competitive advantage in the energy transition while building a major captive market for mass produced SiBrick products.

These and other developments, including moving our premises to the Tonsley Innovation District are described in more detail in this report. We remain closely focused on our core silicon energy storage brick products as they are the key to the performance of our applications like SiBox and SiPHyR, and have a potential mass market in other technologies. I look forward to reporting progress to mass production in the near future.



Dr Kevin Moriarty
Executive Chairman

Commercialisation Report

The Company has been notified that it is eligible for up to \$5m in assistance from the Australian Government's Industry Growth Fund (IGF) for commercialisation of its SiBox and SiBrick technology. Dr Jason Chaffey was engaged by the Company to lead this commercial strategy for the IGF.

A comprehensive strategy to advance the commercialisation of 1414 Degrees' s technology and enhance its value proposition is underway. The strategic plan comprises three key aspects:

1. Deployment of a >10MWhr SiBox module showcasing the SiBrick and SiBox at a larger scale, integrated with energy systems.
2. Leading the SiPHyR program to develop a SiBrick integrated methane pyrolysis prototype, mitigating risks and accelerating commercialisation.
3. Conducting extensive market research to inform strategic decisions and product development.

SiBox®

SiBox is a novel technology to store electricity from intermittent renewable sources in the form of latent heat from the phase change of silicon and recover as clean heat for industrial applications.

The SiBox Demonstration Module (SDM) project was completed during the quarter. This successfully tested the technology and advanced it to a more commercially ready stage, from Technology Readiness Level) from 4 to 7. This paves the way for larger-scale SiBox applications that can provide clean heat for industry and significantly reduce emissions.

The SDM contains a single modular arrangement of SiBrick with a heating system and energy recovery to provide optimal energy density and charge/discharge rates. Multiples of these modules can be installed inside a single insulated container for maximum efficiency.

As announced during the quarter, the SDM successfully completed a 12 month testing phase with the following milestones:

- Delivered stable and continuous hot air at output temperature set points ranging from 650°C to 900°C (Figure 1 below)
- Maintained 24/7 stable heat output while varying its charging to take advantage of available renewable energy and low-cost grid electricity
- Provided flexible heat output rates with consistent temperature, meeting a variety of industrial requirements
- Validated its ability to bolster electricity grids with frequency control services
- Demonstrated its durability and operational efficiency by cycling more than 230 times, consistently delivering heat at critical temperatures up to 900°C
- After 230 cycles, showed no significant variation in performance (Figure 2 below). SiBrick material analysis showed no degradation in the material properties after 6 months. After 230 cycles, a final material sample was removed and sent for analysis.
- The test campaign collected significant data across a range of sensors including temperature, pressure and flow rate to quantify the performance under variable operating conditions simulating a variety of

process requirements. This data validates the engineering design tools and de-risks future SiBox implementations.

Figure 1 SDM performance showing stable heat supply at various set point temperatures

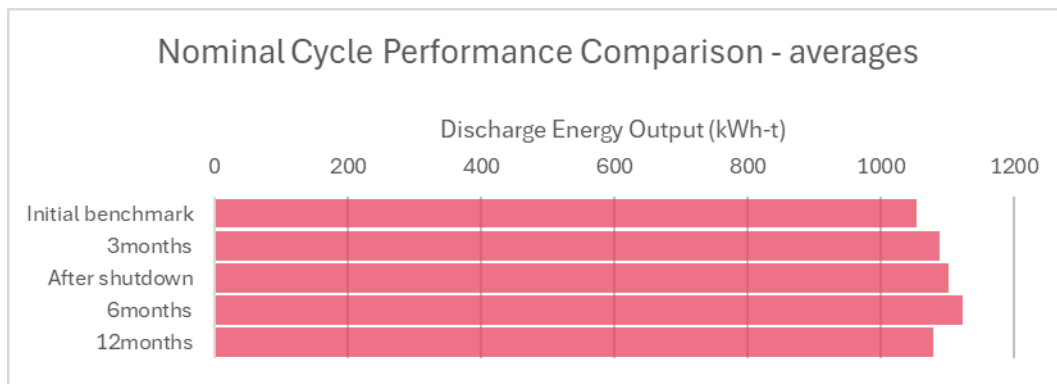
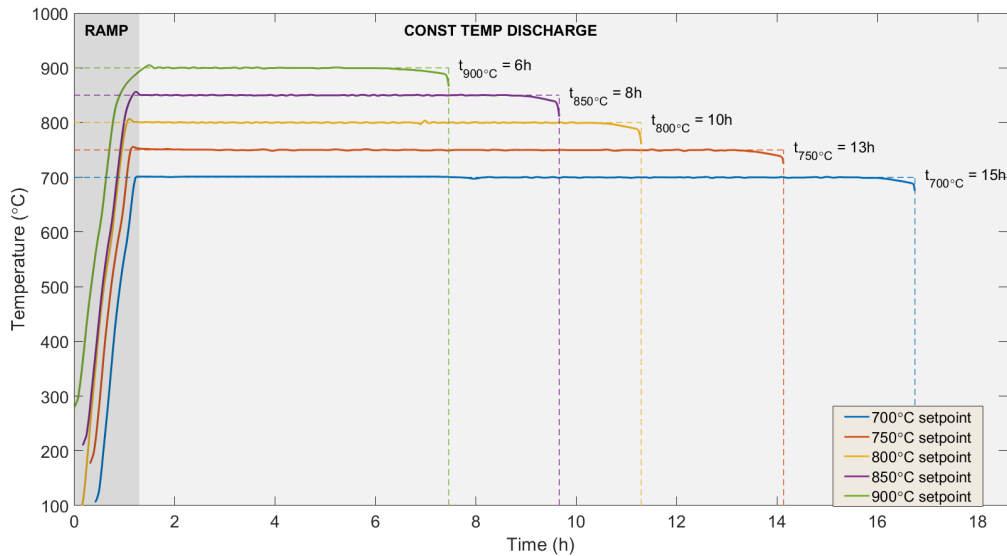


Figure 2. SDM energy discharge showing stable performance for 12 months

SiBrick®

The Company is preparing a large-scale manufacturing strategy for its silicon thermal storage media SiBrick® to service future installations of SiBox® and SiPhyR. To date, development and thermal cycling of SiBrick has demonstrated its functionality for heat storage and discharge and the next step is to scale up for mass production and verify its performance in a larger pilot SiBox in a commercial setting. Making SiBrick commercially viable involves ongoing maintenance of production quality, material supplies, production planning, and SiBrick recycling.

A 5-year cost reduction pathway has been estimated, based on lower cost materials and economies of scale to make it competitive with conventional natural gas heating.



The Company continued to work with Refratechnik Steel GMBH to advance a mass manufacturable SiBrick product, with testing to commence in the current quarter after the move to 1414 Degrees new R&D facility in the Tonsley Innovation District of Adelaide.

SiPHyR™

Pyrolysis of methane provides a pathway for low-emissions hydrogen production with significant advantages over hydrogen produced using electrolysis or steam reforming.

SiPHyR will improve the heat delivery and management in current bubble-column pyrolysis reactors using an innovative, patent-pending technology developed by the University of Adelaide. Integrating 1414 Degrees SiBrick thermal energy storage material will decrease the cost of energy and facilitate use of intermittent renewable electricity generation.

1414 Degrees has assembled a team of experts, from UoA, RMIT, Woodside and Kanthal to further develop, demonstrate and commercialise through a \$5.2M project (\$2.5M co-funding from Australian Government's CRC-P scheme) which will progress the SiPHyR technology to TRL 5.

1414 Degrees has entered into an exclusive license agreement with UoA which grants exclusive licenses to two patents, one a reactor design for the novel dual-interconnected bubble column, and the second a process for high efficiency hydrogen generation using methane pyrolysis. The Company has an option for outright acquisition of the patent rights in future.

Aurora Energy Precinct

The transmission connection application to connect the big battery energy storage system (140MW/280MWh BESS) to the power grid is moving forward. The joint venture company SiliconAurora Pty Ltd continues to work with the network utility to convert the 275kV private power line to a public Designated Network Asset, executing a termsheet for an agreement between the various parties who own and use the line.

To ensure seamless integration with the existing grid, the parties have commissioned two additional expert studies to analyse the potential impact of the BESS and Aurora's renewable energy projects on other users of the power line. These studies are anticipated to confirm positive effects on both grid stability and capacity.

The parties will finalise commercial terms for the conversion, with the full agreement currently scheduled for signing in the third quarter. The Company expects transmission connection approval for the BESS in mid-year. Following this approval, the Company will re-assess the feasibility of implementing a large-scale SiBox system on the same site. The development approval for this system was secured in 2020.

Corporate and Financial

During the quarter the Company was awarded \$2.5m from the Australian Government to commercialise its SiPHyR hydrogen technology. This will be supplemented by contributions from partners to design and build the prototype reactor.



The Company received \$1.47m R&D rebate in the March quarter. It was also notified that it was eligible for up to \$5m in assistance from the Australian Government's Industry Growth Fund (IGF) for commercialisation of its SiBox and SiBrick technology. Consultant Dr Jason Chaffey was engaged by the Company to lead this commercial strategy for the IGF.

Our SiBox development team is completing a final report for a successful grant awarded by the Federal Government's Modern Manufacturing Initiative (MMI). The Company is expecting to be paid \$550,000 to conclude the \$2.2m project in the current quarter.

Our joint venture on the Aurora Renewable Energy Precinct, continues to make progress. Vast Solar Pty Ltd have initiated an application to connect their solar generation and storage project (VS1) to the grid. Once this application is approved, Vast Solar will be required to pay \$1.5 million to 1414 Degrees to complete their purchase of a 50% stake in the joint venture company SiliconAurora Pty Ltd. This is expected to complete in the September quarter.

Investment bank Hannam & Partners continued their research reporting and to advise on divestment of the Aurora BESS interest. The BESS project is attracting global interest from infrastructure funds, indicating that a sale could potentially significantly boost the Company's liquidity. H&P have also introduced parties interested in funding future large scale SiBox deployments for decarbonising industry.

Your Company ended the quarter with \$2.32 million in cash, an increase of \$881,000 from the previous quarter. As required by ASX Listing Rule 4.7C3, the Company notes that \$76,000 was paid to related parties during the quarter. These payments were Directors Fees.

AUTHORISED BY:

Dr Kevin Moriarty, Executive Chairman on behalf of the Board of Directors

For investor enquiries or further information, please contact:

info@1414degrees.com.au or +61 8 8357 8273

ABOUT 1414 DEGREES LIMITED

1414 Degrees is an innovative clean energy company specialising in thermal energy storage solutions to decarbonise high temperature industry and power generation. 1414 Degrees' SiBrick® is a mass manufacturable silicon thermal storage which harnesses silicon's extremely high energy density. The SiBox® latent heat battery, one of several applications for SiBrick, provides consistent, carbon-free heat at high temperatures from renewable sources.

In 2019 the Company made the strategic purchase of the Aurora Energy Precinct (AEP) located near Port Augusta, South Australia. AEP is a long-term renewable energy initiative to deliver reliable electricity to the region and National Electricity Market. The precinct has approval for 14D to pilot and demonstrate a large commercial scale version of the SiBox technology.

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



Forward-looking statements

This announcement includes forward-looking statements which may be identified by words such as 'anticipates', 'believes', 'expects', 'intends', 'may', 'will', 'could', or 'should' and other similar words that involve risks and uncertainties. These forward-looking statements are based on the 1414 Degrees' expectations and beliefs concerning future events as at the date of this announcement. Forward-looking statements are necessarily subject to risks, uncertainties and other factors, many of which are outside the control of 1414 Degrees, which could cause actual results to differ materially from such statements. 1414 Degrees makes no undertaking to update or revise the forward-looking statements made in this announcement to reflect any change in circumstances or events after the date of this announcement.

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