



30 April 2024

ASX:14D

## March 2024 Quarterly Activity Report

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### 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

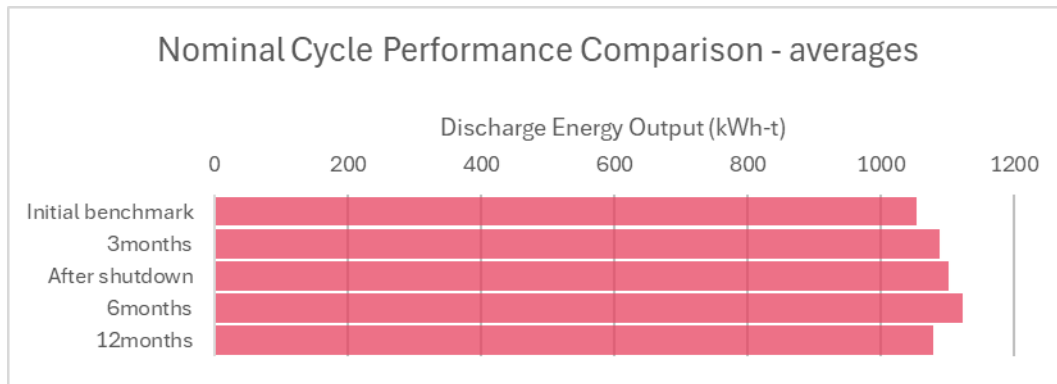
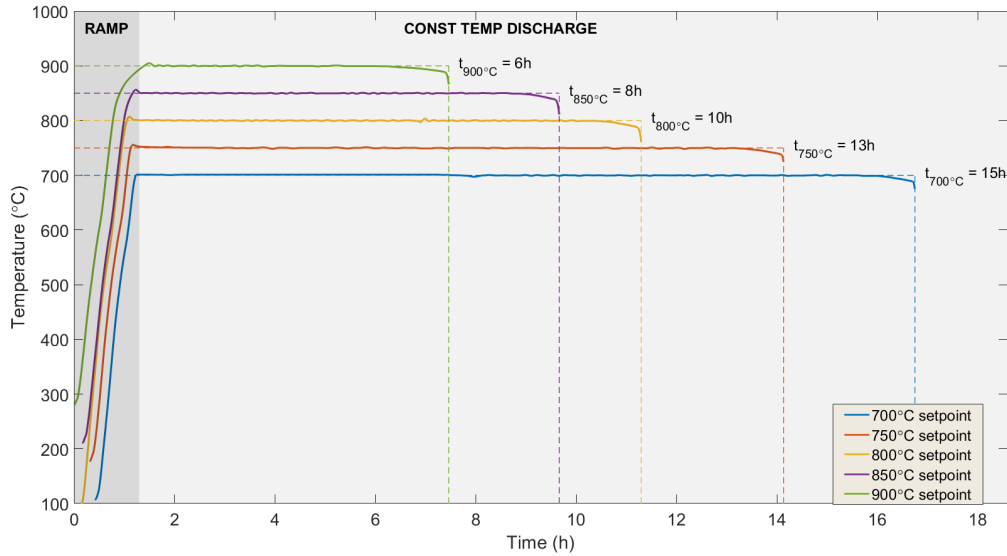


Figure 2. SDM energy discharge showing stable performance for 12 months

**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](mailto: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](http://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](http://www.1414degrees.com.au)

## Appendix 4C

### Quarterly cash flow report for entities subject to Listing Rule 4.7B

**Name of entity**

1414 Degrees Limited

**ABN**

57 138 803 620

**Quarter ended ("current quarter")**

31 March 2024

<b>Consolidated statement of cash flows</b>	<b>Current quarter \$A'000</b>	<b>Year to date (9 months) \$A'000</b>
<b>1. Cash flows from operating activities</b>		
1.1 Receipts from customers	-	-
1.2 Payments for		
(a) research and development	(454)	(1,607)
(b) product manufacturing and operating costs		
(c) advertising and marketing	(30)	(109)
(d) leased assets	(2)	(3)
(e) staff costs	(61)	(155)
(f) administration and corporate costs	(272)	(966)
1.3 Dividends received (see note 3)	-	-
1.4 Interest received	1	14
1.5 Interest and other costs of finance paid	-	-
1.6 Income taxes paid	-	-
1.7 Government grants and tax incentives	1,468	1,468
1.8 Other (provide details if material)		
- Partner project contributions	350	900
- GST	(5)	3
<b>1.9 Net cash from / (used in) operating activities</b>	<b>995</b>	<b>(455)</b>
<b>2. Cash flows from investing activities</b>		
2.1 Payments to acquire or for:		
(a) entities	-	-
(b) businesses	-	-
(c) property, plant and equipment	(57)	(58)



Consolidated statement of cash flows	Current quarter \$A'000	Year to date (9 months) \$A'000
(d) investments	-	-
(e) intellectual property	-	-
(f) other non-current assets	-	-
2.2 Proceeds from disposal of:		
(a) entities	-	-
(b) businesses	-	-
(c) property, plant and equipment	-	-
(d) investments	-	-
(e) intellectual property	-	-
(f) other non-current assets	-	-
2.3 Cash flows from loans to other entities	39	(310)
2.4 Dividends received (see note 3)	-	-
2.5 Other (provide details if material)	-	-
<b>2.6 Net cash from / (used in) investing activities</b>	<b>(18)</b>	<b>(368)</b>

<b>3. Cash flows from financing activities</b>		
3.1 Proceeds from issues of equity securities (excluding convertible debt securities)	-	1,471
3.2 Proceeds from issue of convertible debt securities	-	-
3.3 Proceeds from exercise of options	-	-
3.4 Transaction costs related to issues of equity securities or convertible debt securities	(1)	(163)
3.5 Proceeds from borrowings	-	-
3.6 Repayment of borrowings	-	-
3.7 Transaction costs related to loans and borrowings	-	-
3.8 Dividends paid	-	-
3.9 Other (provide details if material)	(95)	(111)
<b>3.10 Net cash from / (used in) financing activities</b>	<b>(96)</b>	<b>1,197</b>

<b>Consolidated statement of cash flows</b>		<b>Current quarter \$A'000</b>	<b>Year to date (9 months) \$A'000</b>
<b>4.</b>	<b>Net increase / (decrease) in cash and cash equivalents for the period</b>		
4.1	Cash and cash equivalents at beginning of period	1,442	1,949
4.2	Net cash from / (used in) operating activities (item 1.9 above)	995	(455)
4.3	Net cash from / (used in) investing activities (item 2.6 above)	(18)	(368)
4.4	Net cash from / (used in) financing activities (item 3.10 above)	(96)	1,197
4.5	Effect of movement in exchange rates on cash held	-	-
<b>4.6</b>	<b>Cash and cash equivalents at end of period</b>	<b>2,323</b>	<b>2,323</b>

<b>5. Reconciliation of cash and cash equivalents</b> at the end of the quarter (as shown in the consolidated statement of cash flows) to the related items in the accounts	<b>Current quarter \$A'000</b>	<b>Previous quarter \$A'000</b>
5.1 Bank balances	2,323	1,442
5.2 Call deposits	-	-
5.3 Bank overdrafts	-	-
5.4 Other (provide details)		
<b>5.5 Cash and cash equivalents at end of quarter (should equal item 4.6 above)</b>	<b>2,323</b>	<b>1,442</b>

<b>6. Payments to related parties of the entity and their associates</b>	<b>Current quarter \$A'000</b>
6.1 Aggregate amount of payments to related parties and their associates included in item 1	76
6.2 Aggregate amount of payments to related parties and their associates included in item 2	-
<i>Note: if any amounts are shown in items 6.1 or 6.2, your quarterly activity report must include a description of, and an explanation for, such payments.</i>	

## Quarterly cash flow report for entities subject to Listing Rule 4.7B

<b>7. Financing facilities</b>	<b>Total facility amount at quarter end \$A'000</b>	<b>Amount drawn at quarter end \$A'000</b>
<i>Note: the term "facility" includes all forms of financing arrangements available to the entity.</i>		
<i>Add notes as necessary for an understanding of the sources of finance available to the entity.</i>		
7.1 Loan facilities	-	-
7.2 Credit standby arrangements	-	-
7.3 Other (please specify)	-	-
<b>7.4 Total financing facilities</b>	-	-
<b>7.5 Unused financing facilities available at quarter end</b>		-
7.6 Include in the box below a description of each facility above, including the lender, interest rate, maturity date and whether it is secured or unsecured. If any additional financing facilities have been entered into or are proposed to be entered into after quarter end, include a note providing details of those facilities as well.		

<b>8. Estimated cash available for future operating activities</b>	<b>\$A'000</b>
8.1 Net cash from / (used in) operating activities (item 1.9)	995
8.2 Cash and cash equivalents at quarter end (item 4.6)	2,323
8.3 Unused finance facilities available at quarter end (item 7.5)	-
<b>8.4 Total available funding (item 8.2 + item 8.3)</b>	<b>2,323</b>
<b>8.5 Estimated quarters of funding available (item 8.4 divided by item 8.1)</b>	N/A
<i>Note: if the entity has reported positive net operating cash flows in item 1.9, answer item 8.5 as "N/A". Otherwise, a figure for the estimated quarters of funding available must be included in item 8.5.</i>	
8.6 If item 8.5 is less than 2 quarters, please provide answers to the following questions:	
8.6.1 Does the entity expect that it will continue to have the current level of net operating cash flows for the time being and, if not, why not?	
Answer:	
8.6.2 Has the entity taken any steps, or does it propose to take any steps, to raise further cash to fund its operations and, if so, what are those steps and how likely does it believe that they will be successful?	
Answer:	
8.6.3 Does the entity expect to be able to continue its operations and to meet its business objectives and, if so, on what basis?	
Answer:	
<i>Note: where item 8.5 is less than 2 quarters, all of questions 8.6.1, 8.6.2 and 8.6.3 above must be answered.</i>	

## Compliance statement

- 1 This statement has been prepared in accordance with accounting standards and policies which comply with Listing Rule 19.11A.
- 2 This statement gives a true and fair view of the matters disclosed.

30 April 2024

Date: .....

The Chairman of the Board

Authorised by: .....  
(Name of body or officer authorising release – see note 4)

## Notes

1. This quarterly cash flow report and the accompanying activity report provide a basis for informing the market about the entity's activities for the past quarter, how they have been financed and the effect this has had on its cash position. An entity that wishes to disclose additional information over and above the minimum required under the Listing Rules is encouraged to do so.
2. If this quarterly cash flow report has been prepared in accordance with Australian Accounting Standards, the definitions in, and provisions of, *AASB 107: Statement of Cash Flows* apply to this report. If this quarterly cash flow report has been prepared in accordance with other accounting standards agreed by ASX pursuant to Listing Rule 19.11A, the corresponding equivalent standard applies to this report.
3. Dividends received may be classified either as cash flows from operating activities or cash flows from investing activities, depending on the accounting policy of the entity.
4. If this report has been authorised for release to the market by your board of directors, you can insert here: "By the board". If it has been authorised for release to the market by a committee of your board of directors, you can insert here: "By the [name of board committee – eg Audit and Risk Committee]". If it has been authorised for release to the market by a disclosure committee, you can insert here: "By the Disclosure Committee".
5. If this report has been authorised for release to the market by your board of directors and you wish to hold yourself out as complying with recommendation 4.2 of the ASX Corporate Governance Council's *Corporate Governance Principles and Recommendations*, the board should have received a declaration from its CEO and CFO that, in their opinion, the financial records of the entity have been properly maintained, that this report complies with the appropriate accounting standards and gives a true and fair view of the cash flows of the entity, and that their opinion has been formed on the basis of a sound system of risk management and internal control which is operating effectively.