29 January 2024

Companies Announcements Office
ASX Limited
10th Floor, 20 Bridge Street
SYDNEY NSW 2000

DECEMBER 2023 QUARTER ("QUARTER") OPERATIONS REPORT

Clean Hydrogen Technologies

On 2 August 2022 BPH announced that, following its shareholders' meeting on 21 June 2022 at which shareholders voted unanimously to approve an investment in hydrogen technology company Clean Hydrogen Technologies Corporation ("Clean Hydrogen" or "Vendor" or "Borrower"), BPH and its investee Advent Energy Ltd ("Advent" or "Lender"), together the "Purchasers", settled for the acquisition of a 10% interest in Clean Hydrogen for US$1,000,000 ("Cash Consideration") (8% BPH and 2 % Advent.

The Purchasers had a first right of refusal to invest further in Clean Hydrogen to a maximum of a further US$1,000,000 for an additional 10% interest. The Purchasers loaned a further US$950,000 ("Additional Cash Consideration") under this agreement and the Purchasers and Clean Hydrogen will execute a Loan Conversion Agreement which will enable the conversion of the US$950,000 loan into the relevant Subscription Shares Tranche 2, representing the Purchasers further 9.5% interest in Clean Hydrogen. BPH now has an interest of 15.6% and Advent has an interest of 3.9% interest in Clean Hydrogen. Clean Hydrogen will issue 760 share options to BPH and 190 share options to Advent, with an exercise price of USD$3,000 each, exercisable immediately, with the option to convert into shares in Clean Hydrogen expiring ten years from the date of issue.

The parties acknowledge and agree that the Cash Consideration and Additional Cash Consideration shall be used by Clean Hydrogen to design, build, produce and test a reactor that can produce a minimum of 3.2kgs and as high as 15kgs of hydrogen per hour and to submit at least 2 new patents in an agreed geography, relevant to the production of hydrogen from proprietary technology.

Clean Hydrogen has developed and tested its processing capabilities which have successfully produced hydrogen, with no CO2 emissions, achieving on average above 90% cracking efficiency. Cracking efficiency refers to the percentage of hydrocarbons broken into solid carbon and hydrogen per hour. This high level of cracking efficiency has been consistently achieved across proof-of-concept tests undertaken by Clean Hydrogen in 2022 and 2023.

Clean Hydrogen have tested the performance of a number of catalysts in the period between April 2022 and September 2022 and have determined that several of the catalysts have given methane cracking conversion rate (efficiency) more than 90%, for several hours. To achieve these results, Clean Hydrogen currently uses methane as its feedstock however, in the future, plans to use natural gas as its feedstock through the pyrolysis method (explained further below).

Clean Hydrogen's development activities and testing have shown that, by pyrolysis processing (not burning) methane gas using its catalyst in a modified fluidised bed reactor, it can produce hydrogen with no CO2 emissions. This is referred to as Turquoise Hydrogen, which is hydrogen that is produced using a process called pyrolysis, where the feedstock is natural gas (specifically the hydrocarbons such as acetylene, methane, butane, propane, and others). Pyrolysis is defined as the method of heating solids, liquids, or gases in the absence of oxygen[1]. The pyrolysis process is not

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new and has been used by the oil industry for many years. What is new, is Clean Hydrogen's success in the efficiency of its cracking the methane into Turquoise Hydrogen with non-CO2 emissions and the quality of the carbon black produced, being majority Carbon Nano-Tubes (CNTs), which are highly conductive and used in battery manufacturing.

In Clean Carbon's testing, the majority of the carbon formed (over 80%) from cracking hydrocarbons to date are CNTs. This type of carbon was determined using Scanning Electron Microscopy (SEM) analysis, which enables the high-resolution imaging of single nanoparticles with sizes well below 1 nm or micron, as is the case for CNTs. The Clean Hydrogen process is more specifically called a thermos-catalytic pyrolysis, which uses 800- 900 degrees heat centigrade in the reactor in the absence of oxygen.

The Company confirms that there are no non-CO2 greenhouse gas emissions that are produced or released as a result of Clean Hydrogen's production process.

Steam Methane Reforming vs Clean Carbon pyrolysis process

Over 80% of the world's hydrogen is produced using a process called Steam Methane Reforming (SMR)[2]. The Clean Hydrogen process requires similar energy needs as SMR and at scale, Clean Hydrogen is of the view that it can be produced at a similar price.

Clean Hydrogen's Chief Science Officer, Dr Vivek Nair (PhD material science engineering) has examined research undertaken by Nuria Sánchez-Bastardo, Robert Schlögl, and Holger Ruland published in Industrial & Engineering Chemistry Research 2021 60 (32), 11855-11881[3], which shows that the electrical energy required to produce 1kg of hydrogen from SMR is 8.81 kwh, 39.69kwh for electrolysis and 5.24kwh for pyrolysis at the reaction level. As such, the pyrolysis process requires less energy than SMR to achieve cracking and uses the same feedstock, natural gas. This energy analysis is conducted without considering the benefits from the use of a catalyst in the pyrolysis process, such as Clean Hydrogen's catalyst, which implies that pyrolysis at scale can be cheaper than SMR. Further, as the process creates two products, which are hydrogen and CNTs, the combined income source provides a means to produce hydrogen at a cheaper net cost.

Clean Hydrogen

The Clean Hydrogen solution is being built with flexibility to work downstream at heavy transport fuelling hubs currently in use in the USA, mid-stream at steel plants replacing coking coal and upstream where the natural gas is processed into hydrogen, a much higher energy source which can be piped for all uses including the production of electricity. As such the technology being developed by Clean Hydrogen's solution requires very little change and impact to existing infrastructures and supply chains, unlike other solutions.

Clean Hydrogen has produced hydrogen beyond lab scale tests at the CoE and is now planning to scale up to a commercial production in 2024. There are three (3) stages to Clean Hydrogen scaling to commercial production:

Stage 1 Completed Stage:

Clean Hydrogen has completed work in 2022 / 2023 on how to scale the catalyst production at the CoE. They have also scaled the reactor to 1/3 of the internal diameter of the full scale commercial system reactors planned for use in Stage 3, explained below.

1 'Methane Pyrolysis: hydrogen without CO2 Emissions' www.tno.nl/en/technology-science/technologies/methane-pyrolysis/
2 Nuria Sánchez-Bastardo, Robert Schlögl, and Holger Ruland Industrial & Engineering Chemistry Research 2021 60 (32), 11855-11881https://pubs.acs.org/doi/10.1021/acs.iecr.1c01679
3 https://pubs.acs.org/doi/10.1021/acs.iecr.1c01679

Stage 2 Current Commercial Stage:

Before moving to Stage 3, Clean Hydrogen plans to demonstrate the commercial viability of its two (2) products; Turquoise Hydrogen and solid carbon. This will be performed using a reactor half the internal diameter of the Stage 3 reactor. It will also require Clean Hydrogen to build the end to end process for separating out the hydrogen from the uncracked hydrocarbons and then compressing it into hydrogen bottle storage. Clean Hydrogen will demonstrate the commercial viability of its products by selling a carbon product called carbon composite made from majority based CNTs and Alumina and bottled hydrogen of 99%+ purity. Clean Hydrogen is currently in the final stages of the assembly of the end to end systems for this.

Stage 3 Scale and Commercial:

The Stage 3 system is planned to have two (2) reactors working together, illustrating that Clean Hydrogen can scale several reactors together. Clean Hydrogen's final customer systems are planned to have a network of several reactors working together. Stage 3 is planned for completion in 2024.

Capital

During the period:

- the remaining 4,450,000 shares (representing $89,000 of the $1.9 million Share Placement announced in the September 2023 Quarter) were issued, together with 1,483,333 associated Broker Options with an exercise price of $0.03 per option and an expiry date of 30 September 2024.
- 47,500,000 free listed share options with an exercise price of $0.03 per option and an expiry date of 30 September 2024 attaching to the September Placement were issued subsequent to shareholder approval at the Company's November 2023 Annual General Meeting
- 687,449 shares options with an exercise price of $0.03 per option were exercised
- 4,000 Cleansing Shares and 4,000 Cleansing Options were issued
- the award of 58,000,000 Performance Rights to Director David Breeze were approved at the Company's November 2023 Annual General Meeting. The Performance Rights shall vest upon approval by the Commonwealth - New South Wales Offshore Petroleum Joint Authority (Joint Authority) of the PEP11 Permit extension application (Milestone). If the Milestone has not been achieved prior to 30 November 2028, the Performance Rights will automatically lapse and will not be converted into shares.
- 5,250,000 Incentive Options were issued to staff and consultants with an exercise price of $0.05 per option and an expiry date of 7 December 2028.

Significant activities by the Company's investees' during the December 2023 quarter were as follows:

Advent Energy Limited ("Advent") (BPH 35.8% direct interest)

PEP 11 Permit

Advent Energy Limited's (BPH 35.8% direct interest) 100% subsidiary Asset Energy Pty Ltd is a participant in the PEP11 Joint Venture with partner Bounty Oil and Gas NL (ASX:BUY). PEP 11 interests are:

Advent Energy 85 % / Bounty Oil and Gas 15%

Asset Energy continues to progress the joint venture's applications for the variation and suspension of work program conditions and related extension of PEP-11. This application follows from the fact that in February 2023 a decision by the previous Commonwealth-NSW Joint Authority to refuse the application was quashed by the Federal Court of Australia. Asset has provided additional updated information to the Commonwealth-NSW Joint Authority and the National Offshore Petroleum Titles Administrator ("NOPTA") in relation to its applications.

On 22 November 2023, the NSW Legislative Committee on Environment and Planning tabled its report into the Minerals Legislation Amendment (Offshore Drilling and Associated Infrastructure

Prohibition) Bill 2023, which was referred to the Committee on 29 June 2023. The Bill sought to amend three Acts to prohibit offshore activities in NSW including drilling for petroleum. The inquiry investigated a range of issues, particularly whether the Bill raises any potential constitutional issues and unintended consequences, and its report sets out its findings and proposed recommendations. The relevant link is set out below:

https://www.parliament.nsw.gov.au/committees/inquiries/Pages/inquiry-details.aspx?pk=2977#tab-reportsandgovernmentresponses

The Committee heard from legal experts and has found that aspects of the proposed legislation may be constitutionally invalid and have unintended consequences. The report makes 10 findings and 2 recommendations. The Committee has accordingly recommended that the Bill not pass.

On 9 October 2023 NOPTA updated their website whereby the NEATS Public Portal Application Tracking has been updated to show Asset Energy's applications' status is now 'Under Assessment'. The Company understands that the next step in the application process is for the Joint Authority to make its decision on Asset Energy's applications.

While the applications for the variation and suspension of work program conditions and related extension of PEP-11 are being considered by NOPTA, Asset is investigating the availability of a mobile offshore drilling unit to drill the proposed Seablue-1 well on the Baleen prospect which would take approximately thirty-five days to complete. Asset is in communication with drilling contractors and other operators who have recently contracted rigs for work in the Australian offshore beginning in the first half of 2024.

PEP-11 continues in force and the Joint Venture is in compliance with the contractual terms of PEP11 with respect to such matters as reporting, payment of rents and the various provisions of the Offshore Petroleum and Greenhouse Gas Storage Act 2006 (Cth).

Cortical Dynamics Limited ("Cortical") (BPH 16.4% direct interest)

Investee Cortical Dynamics Limited is an Australian based medical device neurotechnology company that is developing BARM™, an industry leading EEG (electrical activity) brain function monitor. BARM™ is being developed to better detect the effect of anaesthetic agents on brain activity under a general operation, aiding anaesthetists in keeping patients optimally anaesthetised, and complemented by CORDYAN™ (Cortical Dynamics Analytics), a proprietary deep learning system/App focusing on anaesthesiology.

The Australian manufactured and designed, electroencephalographically based (EEG-based), BARM™ system is configured to efficiently image and display complex information related to the clinically relevant state of the brain. When commercialized the BARM™ system will be offered on a stand-alone basis or integrated into leading brand operating room monitors as "plug and play" option.

Cortical raised $10,000 during the quarter from the issue of 50,000 shares at $0.20 and issued 1,150,000 shares to a director and staff as part of remuneration.

Item 1 and 2 details of payments to / receipts from related parties (Appendix 4C)

Line 6.1 outflow of $46,000: $19,470 paid to directors as remuneration and net $26,268 fees paid to Grandbridge Limited.

Line 6.2 outflow of $785,000: Loans to the following companies:

Advent Energy Limited $710,000
Cortical Dynamics Limited $60,000
Molecular Discovery Systems Limited $15,000

Authorised by

David Breeze
Chairman

Appendix 4C

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

Name of entity

BPH ENERGY LIMITED

ABN	**Quarter ended ("current quarter")**
41 095 912 002	DECEMBER 2023

Consolidated statement of cash flows		**Current quarter $A'000**	**Year to date (6 months) $A'000**
1.	**Cash flows from operating activities**		
1.1	Receipts from customers		
1.2	Payments for		
	(a) research and development		
	(b) product manufacturing and operating costs		
	(c) advertising and marketing	(102)	(248)
	(d) leased assets		
	(e) staff costs and director fees	(19)	(75)
	(f) administration and corporate costs	(76)	(257)
1.3	Dividends received (see note 3)		
1.4	Interest received	28	56
1.5	Interest and other costs of finance paid		
1.6	Income taxes paid		
1.7	Government grants and tax incentives		
1.8	Other (settlement of ex-directors' fees)		
1.9	**Net cash from / (used in) operating activities**	**(169)**	**(524)**

2.	**Cash flows from investing activities**		
2.1	Payments to acquire or for:		
	(a) entities		
	(b) businesses		
	(c) property, plant and equipment		
	(d) investments		
	(e) intellectual property		
	(f) other non-current assets		

Consolidated statement of cash flows		Current quarter $A'000	Year to date (6 months) $A'000
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	(785)	(1,730)
2.4	Dividends received (see note 3)		
2.5	Other (provide details if material)		
2.6	**Net cash from / (used in) investing activities**	**(785)**	**(1,730)**

3.	**Cash flows from financing activities**		
3.1	Proceeds from issues of equity securities (excluding convertible debt securities)	89	1,900
3.2	Proceeds from issue of convertible debt securities		
3.3	Proceeds from exercise of options	20	21
3.4	Transaction costs related to issues of equity securities or convertible debt securities	(37)	(175)
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	Proceeds from equity securities not issued		
3.10	**Net cash from / (used in) financing activities**	**72**	**1,746**

4.	**Net increase / (decrease) in cash and cash equivalents for the period**		
4.1	Cash and cash equivalents at beginning of period	5,988	5,614
4.2	Net cash from / (used in) operating activities (item 1.9 above)	(169)	(524)
4.3	Net cash from / (used in) investing activities (item 2.6 above)	(785)	(1,730)

Consolidated statement of cash flows		Current quarter $A'000	Year to date (6 months) $A'000
4.4	Net cash from / (used in) financing activities (item 3.10 above)	72	1,746
4.5	Effect of movement in exchange rates on cash held		
4.6	**Cash and cash equivalents at end of period**	**5,106**	**5,106**

5.	Reconciliation of cash and cash equivalents at the end of the quarter (as shown in the consolidated statement of cash flows) to the related items in the accounts	Current quarter $A'000	Previous quarter $A'000
5.1	Bank balances	5,106	5,988
5.2	Call deposits		
5.3	Bank overdrafts		
5.4	Other (provide details)		
5.5	**Cash and cash equivalents at end of quarter (should equal item 4.6 above)**	**5,106**	**5,988**

6.	Payments to related parties of the entity and their associates	Current quarter $A'000
6.1	Aggregate amount of (payments to) related parties and their associates included in item 1	(46)
6.2	Aggregate amount of (payments to) related parties and their associates included in item 2	(785)

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.

7.	**Financing facilities** *Note: the term "facility' includes all forms of financing arrangements available to the entity.* *Add notes as necessary for an understanding of the sources of finance available to the entity.*	**Total facility amount at quarter end $A'000**	**Amount drawn at quarter end $A'000**
7.1	Loan facilities	88	88
7.2	Credit standby arrangements		
7.3	Other (please specify)		
7.4	**Total financing facilities**	88	88

7.5	**Unused financing facilities available at quarter end**	-
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.	

The facilities shown above are owing to Grandbridge Limited by a BPH subsidiary. The balance is unsecured and interest free.

8.	**Estimated cash available for future operating activities**	**$A'000**
8.1	Net cash from / (used in) operating activities (item 1.9)	(169)
8.2	Cash and cash equivalents at quarter end (item 4.6)	5,106
8.3	Unused finance facilities available at quarter end (item 7.5)	-
8.4	Total available funding (item 8.2 + item 8.3)	5,106
8.5	**Estimated quarters of funding available (item 8.4 divided by item 8.1)**	30.4

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.

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:

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.

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.

Date: 29 January 2024

Authorised by: David Breeze (Director)
(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.