

ASX Announcement

07 APRIL 2022

PARKWAY DEVELOPING TRANSFORMATIONAL WASTE BRINE PROCESSING SOLUTION FOR CSG INDUSTRY

Parkway Corporate Limited (“**Parkway**” or the “**Company**”) (ASX: PWN) is pleased to advise that the Company continues to make significant progress towards commercialising a range of industrial water treatment related technologies (including, amongst others, its iBC[®] technology).

The Company has been interested in providing solutions for the Australian coal seam gas (“**CSG**”) industry for a number of years, as the multi-billion dollar industry is responsible for generating in excess of 55,000 megalitres of associated water, annually. Since acquiring the patented iBC[®] technology in May 2020, the Company has performed a range of evaluations and piloting activities, to assess the potential for the iBC[®] technology to treat wastewaters generated by the CSG industry. Additionally, Parkway has recently commenced the construction of a larger and more sophisticated iBC[®] pilot plant (“**New iBC[®] Pilot Plant**”), to further advance the commercialisation of the iBC[®] technology.

On the basis of our highly successful piloting activities and industry collaboration (including with Worley, through our recently expanded Strategic Partnership Agreement) to date, we believe that the Company is well positioned to continue progressing the commercialisation of the iBC[®] technology.

Key Milestones

The Company has been successful in systematically progressing the development and commercialisation of the iBC[®] technology, with several key milestones outlined below (dates refer to relevant ASX announcement):

- [15 May 2020](#) Announced acquisition of iBC[®] technology (anticipated market size, \$20 - 50M/yr¹).
- [09 Jul 2020](#) Completed acquisition and transfer of IP and secured innovation related grant funds.
- [07 Oct 2020](#) Demonstrated iBC[®] technology had broader applications than originally anticipated.
- [During 2021](#) Extensive technical and iBC[®] pilot studies performed on CSG derived wastewaters. Demonstrated very high recoveries and pathway to zero liquid discharge solution. Range of studies confirm the operational, financial and sustainability advantages.
- [16 Dec 2021](#) Disclosed procurement for long lead items for new larger iBC[®] pilot plant.
- [10 Feb 2022](#) Expanded global strategic partnership with Worley to encompass iBC[®] technology.
- [07 Apr 2022](#) Construction of New iBC[®] Pilot Plant and indicative completion date announced. Updated evaluation identifies potential market opportunity of \$307 million/yr, or up to \$9.2 billion² over the life of existing CSG projects operating in Queensland, Australia.

¹ Internal estimate made by the Company at the time of the acquisition, as announced on 15 May 2020.

² Estimates based on evaluations performed by the Company, incorporating information from a range of public and internal sources. These estimates are provided for illustrative purposes only and should not be relied on for any investment related purposes. All estimates are subject to review, and may be revised or withdrawn, without notice.

New iBC® Pilot Plant

Given the highly encouraging results from testwork performed throughout 2021, as well as positive industry feedback, the Company recently finalised the design for a scaled-up iBC® pilot plant and procured long-lead items (as shown in *Figure 1*). The Company has recently commenced construction of the New iBC® Pilot Plant, which is scheduled for mechanical completion in May 2022. The New iBC® Pilot Plant will assist the Company perform larger scale testwork and produce product samples, for industry evaluation. The New iBC® Pilot Plant will also support a range of ongoing commercial discussions with a range of key stakeholders, including prospective clients and partners.



Figure 1: Specialty process vessels for the New iBC® pilot plant, at PPS-Melbourne facility.

Potential Market Opportunity

Based on combined CSG operator forecasts, the CSG industry in Queensland is currently producing in the order of 55 GL of associated water per year, which over the life of these projects, accounting for natural decline, is likely to reach total production of 1,700 GL. Following the application of a range of existing water treatment processes, these volumes are reduced to a smaller volume of more concentrated wastewater, or brine. These residual brine streams, contain in the order of 194,000 tonnes of dissolved salts annually, which rises to an estimated 5,500,000 tonnes of dissolved salts³, over the life of the existing operational CSG projects.

By converting the associated water volumes to brine, and then to more concentrated brine, using indicative industry conversion factors, including benchmarked costs, has enabled the Company to estimate the cost of treating and ultimately disposing of the brine and/or salt waste streams.

The Company has also performed a range of techno-economic evaluations based on the potential application of the iBC® technology for several CSG based applications. On the basis of testwork performed to date, which we continue to improve and optimise (including through the New iBC® Pilot Plant), we expect that the application of the iBC® technology will offer a number of valuable and complementary benefits for CSG operators, including:

- enabling relevant CSG operator/s to avoid otherwise inevitable brine processing costs, dewatering costs and salt disposal costs (including, a regulated waste levy (\$125 - \$175 per tonne)⁴ which is payable to the Queensland Government); and

³ Estimates of associated water and salt production have been taken from, *Coal seam gas associated water production in Queensland: Actual vs predicted*, Journal of Natural Gas Science and Engineering, J.R. Underschultz, S. Vink, A. Garnett.

⁴ As per the 2022-23 levy rates for Categories 1 and 2 of "Regulated Waste", as published by the Queensland Government's Department of Environment, Land and Water.

- generate revenues through the sale of recovered products (primarily industrial grade caustic soda) from the iBC[®] plant, which are expected to be sufficient to cover the cost of building and operating the iBC[®] plant.

In effect, the complementary benefits outlined above, are expected to result in a potentially self-funding brine treatment plant incorporating iBC[®] technology, which would also enable a CSG operator to achieve additional significant annual cost savings. At an industry level (CSG projects located in Queensland), these annual cost savings are estimated to be in the order of \$307 million, assuming the CSG operators are appropriately processing and disposing of waste brine and salt products at present.

In this context, the Company considers that the brine processing and disposal related liabilities accruing to Queensland's major CSG operators (estimated to be up to \$9.2 billion for the currently operating CSG projects⁵), represents a directly addressable market for the iBC[®] technology, with no viable alternative pathway identified by industry to date.

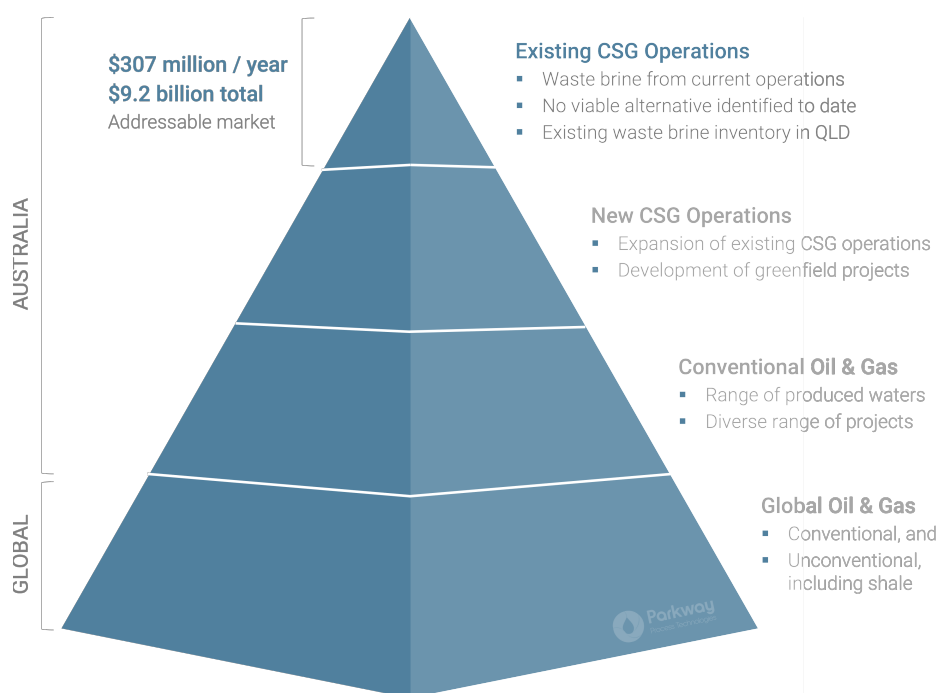


Figure 2: Market Opportunities for the iBC[®] Technology in the Oil & Gas Sector⁵.

Background Information⁶

To produce CSG, wells are drilled into underground coal seams, bringing water (“**CSG water**”) from the seams to the surface. This process reduces pressure in the seams which allows CSG to be released. The quality of CSG water quality varies greatly, however it is generally rich in salts and other minerals.

Australian CSG production is largely concentrated in Queensland. To operate a CSG project in Queensland, a CSG operator must hold an environmental authority (“**EA**”) under the *Environmental Protection Act 1994* (Qld) (“**EP Act**”), before any work can take place on the relevant tenure. Additionally, as part of an EA application under the EP Act, a CSG operator must demonstrate how their CSG water will be managed in accordance with the *Coal Seam Gas Water Management Policy 2012-ESR/2016/2381* (formerly EM738) (the “**Water Management Policy**”), which is administered by the *Queensland Government – Department of Environment & Science*, (the “**Department**”).

Importantly, the Water Management Policy outlines the following rules in relation to the treatment and disposal of CSG water:

⁵ Estimates based on evaluations performed by the Company, incorporating information from a range of public and internal sources. These estimates are provided for illustrative purposes only and should not be relied on for any investment related purposes. All estimates are subject to review, and may be revised or withdrawn, without notice.

⁶ Adapted from the *Coal seam gas water* page, as presented on the *Queensland Government – Department of Environment and Science* website, in March 2022.

“The treatment of CSG water using desalination technologies results in brine and, ultimately, salt residues that must be appropriately managed. The concentration and composition of salts depends on the characteristics of the CSG water and the treatment process.

In resolving the management of brine and salt as part of the management of CSG water, operators must demonstrate that priority 1, outlined below, has been fully considered and determined not to be feasible prior to considering priority 2.

Priority 1 - Brine or salt residues are treated to create useable products wherever feasible.

Priority 2 - After assessing the feasibility of treating the brine or solid salt residues to create useable and saleable products, disposing of the brine and salt residues in accordance with strict standards that protect the environment.”⁷

The Department has been consulting with key stakeholders to develop an industry-wide, long-term management approach for the treatment of CSG water.

The treatment of CSG water results in significant volumes of water being available for a range of uses and smaller quantities of highly saline wastewater (brine). Brine must be appropriately managed as it is unsuitable for release to the environment. Brine is currently stored on an interim basis in dedicated storage ponds until a long-term management approach is adopted.

Additional information about CSG water can be reviewed at the Queensland Government – Department of Environment and Science website:

<https://environment.des.qld.gov.au/management/activities/non-mining/water/csg-water>

Implications for Parkway

Based on an analysis of industry estimates, the CSG water (incorporating a range of concentrated brine streams) being produced by the existing CSG industry in Queensland, contains in the order of 194,000 tonnes of salt on an annual basis, rising to 5,500,000 tonnes over the life of these projects.

Despite the substantial scale of the challenge, the strong regulatory environment requiring the beneficial treatment of the brine (where feasible) which is encapsulated in the “Priorities” outlined in the Water Management Policy, and in excess of \$100 million invested by the industry over more than a decade to identify a long-term solution, no viable pathway has been identified to date.

Against this backdrop, by collaborating with various major CSG operators, Parkway has recently made significant progress in validating the advantages and performance of the patented iBC[®] technology. Importantly, extensive testwork performed to date provides encouragement that the iBC[®] technology is effective in converting the entirety of the problematic brine streams, into a range of solid and liquid product streams, as well as freshwater. The zero liquid discharge (ZLD) processing route envisaged for CSG projects, represents a highly valuable industrial application for the iBC[®] technology.

Through our ongoing investigations (including through our New iBC[®] Pilot Plant), we plan to further reinforce our belief that our iBC[®] technology represents a commercially viable solution, by which CSG operators may achieve the “Priority 1” objectives, referred to in the Water Management Policy.

⁷ Section 1.1, page 1 of the *Water Management Policy*.

COMMENTS FROM GROUP MANAGING DIRECTOR & CEO

Parkway's Group Managing Director & CEO, Bahay Ozcakmak, makes the following comments:



“As part of our ongoing technology commercialisation efforts, throughout 2021, we performed extensive iBC[®] related piloting activities on a range of CSG derived wastewater samples. To date, our piloting activities have been highly successful, confirming our view that the iBC[®] technology is capable of producing valuable products from otherwise problematic wastewaters, including concentrated brines. Based on our findings to date, we expect that through the application of our iBC[®] technology:

- *relevant wastewater streams could potentially be processed through to a highly desirable zero liquid discharge (ZLD) level of treatment; and*
- *a client could both avoid substantial wastewater treatment and disposal costs, whilst simultaneously generating a potentially material revenue stream from their wastewater.*

Through our ongoing investigation (including through our New iBC[®] Pilot Plant), we plan to establish that our iBC[®] technology represents a commercially viable solution for CSG project operators to, i) permanently treat complex brines, and ii) achieve substantial savings compared to a conventional salt disposal pathway. As the supplier of an iBC[®] process technology package, for a prospective brine treatment plant incorporating iBC[®] technology, we expect that Parkway would be well positioned to capture a material share of the savings accruing to a CSG project operator. At an industry wide level (CSG operations in Queensland), we believe these savings to be as high as \$307 million annually, based on existing CSG operations. As the majority of existing CSG operations have been operating for several years, without brine concentration systems in place, the actual annualised costs to treat and dispose of concentrated brines (inclusive of salt products) moving forward, is likely to be significantly larger, given the significant accumulation of legacy waste streams.

Our engineering team has recently taken possession of all major long lead items, including imported pressure vessels, which has enabled us to commence the construction of our New iBC[®] Pilot Plant. The new pilot plant will assist us perform larger scale test work, optimise our process designs, as well as produce product samples, for industry evaluation. The New iBC[®] Pilot Plant will also support a range of ongoing commercial discussions with a range of key stakeholders, including prospective clients and partners.

The continued growth in both our internal capabilities (particularly with the growth of PPS) as well as partnered capabilities (including our recent expansion of our relationship with Worley), is positioning Parkway very strongly, to be able to harness the full potential of our technology portfolio, including our iBC[®] technology.

Our ability to acquire, improve, scale-up and validate the performance of the iBC[®] technology, in a relatively short period of time and on a very modest budget, is an impressive achievement by industry standards. Through our systematic approach, incorporating our in-house techno-economic evaluations, we are now very confident that the market potential for the iBC[®] technology is more significant than what we had assessed at the time of acquisition. The next stages for the commercialisation of the technology are well-advanced. We look forward to providing more details as further milestones are achieved.”

The release of this announcement has been approved by Parkway's Group Managing Director & CEO, Bahay Ozcakmak.

ADDITIONAL INFORMATION

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FORWARD-LOOKING STATEMENTS

This announcement may contain certain “forward-looking statements”. The words “continue”, “expect”, “forecast”, “potential” and other similar expressions are intended to identify “forward-looking statements”. Indications of (and any guidance on) future earnings, financial position, capex requirements and performance are also “forward-looking statements”, as are statements regarding internal management estimates and assessments of market outlook.

Where Parkway expresses or implies an expectation or belief as to future events or results, such expectation or belief is expressed in good faith and believed to have a reasonable basis. However, “forward-looking statements” are not guarantees of future performance and involve known and unknown risks, uncertainties and other factors, many of which are beyond the control of Parkway, its officers, employees, agents and advisors, that may cause actual results to differ materially from those expressed or implied in such statements. There can be no assurance that actual outcomes will not differ materially from these statements. There are usually differences between forecast and actual results, because events and actual circumstances frequently do not occur as forecast and their differences may be material.

Parkway does not undertake any obligation to publicly release any revisions to any “forward-looking statements” to reflect events or circumstances after the date of this announcement, or to reflect the occurrence of unanticipated events, except as may be required under the applicable securities laws.

ABOUT PARKWAY CORPORATE LIMITED

Parkway Corporate Limited is an Australian cleantech company focused on developing and implementing, industrial-scale innovative water treatment solutions. Parkway is listed on the Australian Securities Exchange (ASX: PWN) and is emerging as an innovative player in water related sustainability solutions. With significant inhouse technical expertise and established partnerships, Parkway is well-placed to deliver the next generation of wastewater treatment plants, incorporating the company’s portfolio of world-class technologies.

Parkway operates through three (3) core business units, comprising:

- Parkway Process Solutions (PPS) – Parkway’s primary operating division and an emerging provider of industrial water treatment products, services, solutions and associated technology to customers throughout Australia. PPS has recently established commercial relationships with key water industry participants, including globally recognised OEMs;
- Parkway Process Technologies (PPT) – Parkway’s technology development, acquisition, and commercialisation division. PPT owns a portfolio of industrial wastewater treatment technologies, including the patented aMES® and iBC® process technologies. PPT has global aspirations and is supported by a network of strategic partners, including global engineering company Worley; and
- Parkway Ventures (PV) – holds a portfolio of project equity and royalty interests, including interests relating to Parkway’s Karinga Lakes Potash Project in the Northern Territory of Australia.

Additional information regarding Parkway, including an overview of the corporate structure of Parkway and the companies in its corporate group, can be found at: www.pwnps.com/pages/about-us.

SOCIAL MEDIA & EMAIL ALERTS

Parkway is committed to communicating with the investment community through all available channels. Whilst the ASX announcements platform remains the most appropriate channel for market-sensitive news about Parkway, investors and other interested parties are also encouraged to:

- follow Parkway on LinkedIn, Twitter, Facebook and YouTube; and
- subscribe for our email alert service, Parkway News Alerts, on our website (www.pwnps.com).