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ASX Announcement

04 September 2024

SIGNIFICANT BRINE TECHNOLOGY BREAKTHROUGH FOR CSG INDUSTRY

Highlights

- Development of highly innovative brine processing technology, based on "salt splitting".
- Technology successfully demonstrated to be effective in processing CSG derived brines.
- First production of mineral acid from wastewater (industrial brine) in Australia.

MELBOURNE, Australia – Parkway Corporate Limited ("**Parkway**" or the "**Company**") (ASX: PWN, FSE: 4IP) is pleased to announce a significant brine technology breakthrough, which has led to the first production of hydrochloric acid (HCl) from CSG derived brines, in Australia (refer *Figure 1*).

Figure 1: Industrial Chemical Product Samples Produced Through Innovative Electrochemical Process

1a: Raw CSG brine samples x2 (L). **1b:** Sodium hydroxide (NaOH) sample (C). **1c:** Hydrochloric acid (HCl) sample (R).

THE TECHNOLOGY

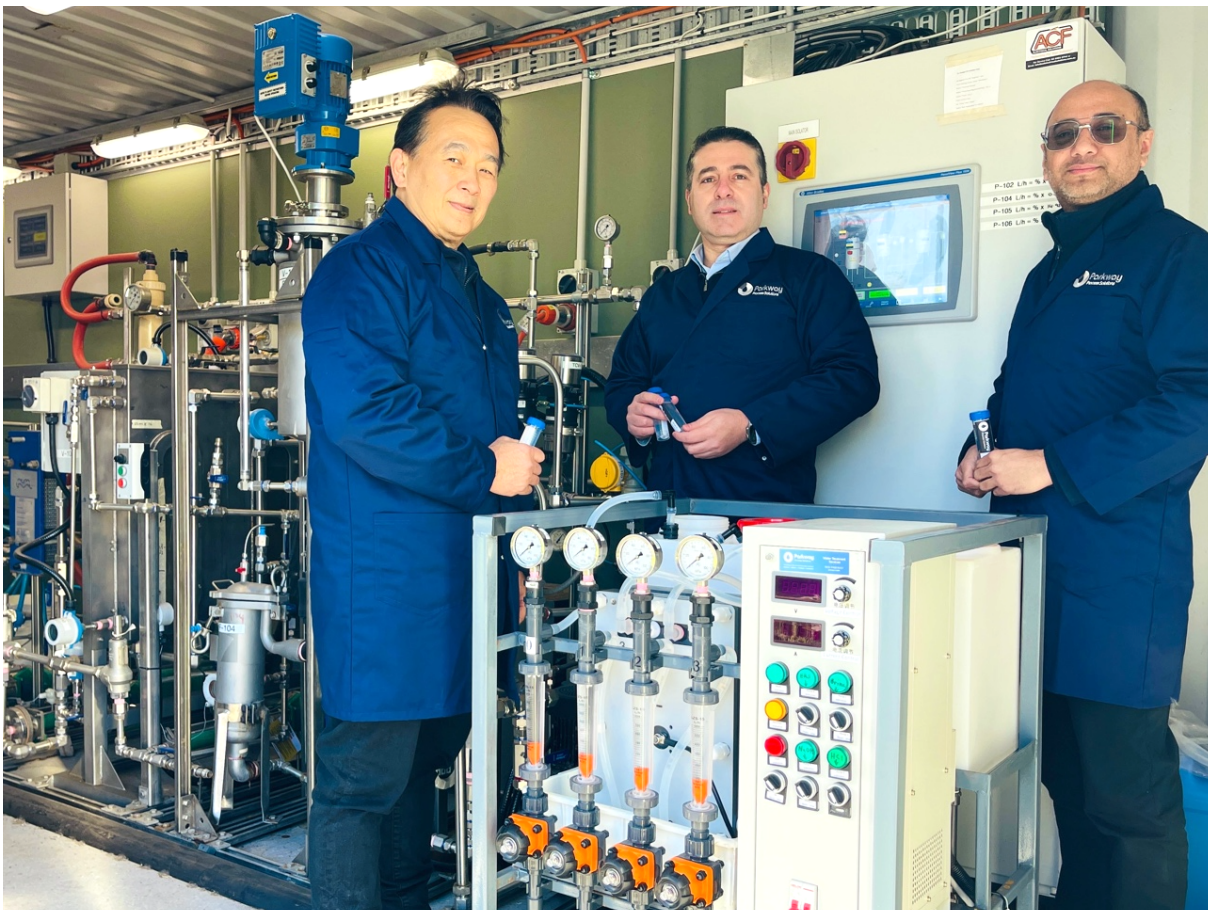
Building on Parkway's extensive portfolio of proprietary process technologies, including innovative brine processing technologies, a key area of interest since the release of Parkway's Master Plan[1] on 22 June 2023, has been the valorisation of sodium chloride rich brines. Due to the highly complex nature of many industrial brines, including coal seam gas (CSG) derived brines, the production of clean brine and salt streams suitable for further downstream processing, is generally considered by industry to be difficult to achieve. In this regard, including as outlined in Master Plan, Parkway has developed extensive inhouse expertise which has led to the development of several proprietary flowsheets, incorporating various innovative technologies, which assist in addressing these processing challenges.

Following the production of clean salt streams (including sodium chloride rich brine streams), Parkway has been evaluating various process routes to convert these streams into valuable industrial chemical products. A key area of recent research has been the integration of various electrochemical processes, to achieve controlled "salt splitting" and the efficient synthesis of various industrial chemical products.

In recent months, several CSG derived brine samples have been pre-treated and undergone further downstream processing through a proprietary flowsheet, which incorporated an innovative pilot scale electrochemical salt splitting technology (refer *Figure 2*). Recent analysis has confirmed that these piloting activities have successfully converted all the clean salt (NaCl) stream into caustic soda (NaOH), as well as hydrochloric acid (HCl), both widely used industrial chemical products. Parkway believes these groundbreaking results represent the first production of a mineral acid from an Australian waste brine resource, marking another significant milestone for Parkway's pioneering research efforts.

Importantly, this downstream salt-splitting brine process technology package has significant potential applications beyond Master Plan, with the production of mineral acids and caustic soda presenting significant opportunities in the mining, downstream mineral processing and refining industries, globally.

Figure 2: Parkway Pilot Plant Incorporating Innovative Electrochemical Brine Processing Technology



2a: Parkway electrochemical pilot plant in the foreground (R). **2b:** Parkway brine processing pilot plant in the background (L).

[1] *Queensland Brine Solutions (QBS) Master Plan Concept*, as released on the ASX on 22 June 2023 and available at the ASX website at: https://cdn-api.markitdigital.com/apiman-gateway/ASX/asx-research/1.0/file/2924-02678399-6A1155028&v=fc9bdb61fe50ea61f8225e24ce041a0e155a9400

KEY APPLICATIONS

As outlined above, the production and processing of clean brine and salt streams through Parkway's proprietary process flowsheets, enables further downstream processing, including through the integration of Parkway's innovative electrochemical processes.

The potential applications for salt splitting technologies are diverse across a range of industries, however, given the specific energy intensity of the electrochemical processes, Parkway is focused on high value industrial applications, particularly in the downstream energy and mining sectors, where concentrated brine streams can be highly problematic.

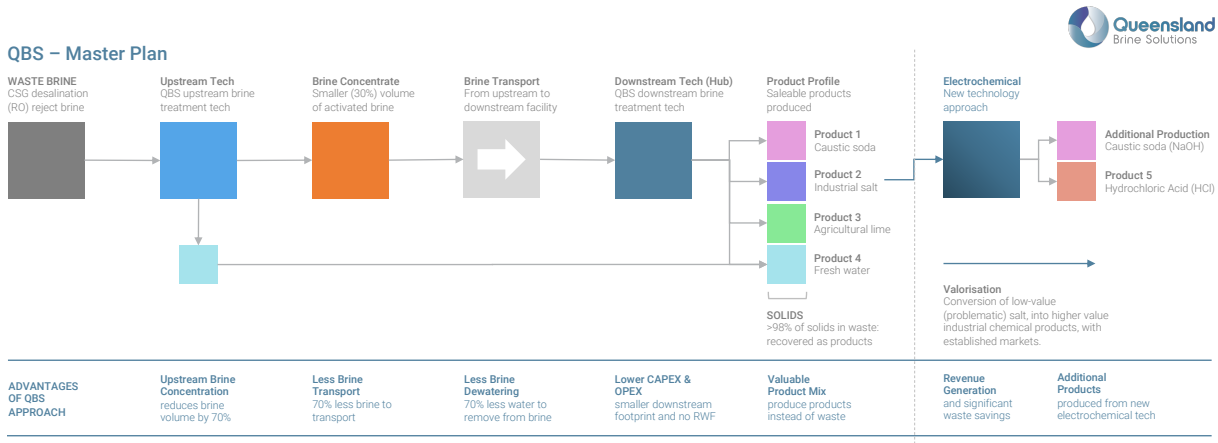
Potential future applications include processing of seawater reverse osmosis (SWRO) derived brines; however, this is considered a large-scale but relatively low-value opportunity in the near term.

Queensland CSG industry

The Master Plan released by Queensland Brine Solutions (QBS, a wholly owned subsidiary of Parkway) outlined an innovative technology-based solution to address the significant industry-wide waste brine and salt challenges facing the Queensland CSG industry. Parkway believes the Master Plan developed by QBS, provides the only viable long-term solution for processing waste brine and salts produced by the CSG industry and therefore, expects this approach will progressively be adopted as the best available technology (BAT), by industry.

Notwithstanding the significant advantages of the QBS approach, Parkway has continued to further improve the proposed flowsheet, through the option to integrate the innovative electrochemical process (refer *Figure 3*), to further convert the clean industrial salt (NaCl, product 2) into additional caustic soda (NaOH) and hydrochloric acid (HCl, product 5). Given the caustic soda is the most valuable product in the product matrix, additional production will further improve project economics, whilst also producing a new product (HCl), through a highly effective valorisation process. Further details regarding the commercial implications of this approach are outlined in the *Go-To-Market Strategy* section, below.

Figure 3: Electrochemical Enhancement of QBS Master Plan (refer right-hand side of graphic)



Acid Demand in Queensland

In July 2024, the Queensland Government released a Queensland acid supply study[2] outlining the significant forecast shortfall in the supply of acid in Queensland, particularly sulphuric acid. The study is timely, given the pending closure of Glencore's Mount Isa Mines Copper Smelter (which produces 47% of Queensland's sulphuric acid supply) in late 2025. According to the study, demand for sulphuric acid in Queensland is forecast to more than double (potentially triple) in the next decade, driven by several existing and emerging industries, including a growing pipeline of critical minerals projects.

Whilst Parkway's salt splitting technology is also suitable for the production of sulphuric acid (provided sulphate ions are present in the feed brine), the Queensland Government acid supply study identified hydrochloric acid as a potential substitute for sulphuric acid, in certain critical minerals applications.

[2] *Sulphuric Acid Supply Study*, report prepared for the Queensland Government (DSDI), by CRU Consulting and Core Resources, published 01 July 2024.

Additional Applications

Parkway is also evaluating the application of the innovative electrochemical processes (as part of various integrated flowsheets) to a broader range of waste brines, which are expected to produce similarly encouraging results. Importantly, several of these waste brine streams contain large concentrations of sulphate (SO_4) ions, which will result in the production of sulphuric acid (H_2SO_4) instead of hydrochloric acid (HCl), whilst still producing significant quantities of sodium hydroxide (NaOH).

GO-TO-MARKET STRATEGY

As outlined above, although the innovative electrochemical process technologies disclosed today have valuable applications in a diverse range of industries, Parkway is most immediately focused on large-scale applications in the CSG industry, particularly in Queensland.

Strategic Market

The QBS Master Plan outlined how the Queensland CSG industry is facing significant long-term brine and salt disposal related challenges, which based on the existing regulatory framework, requires processing in accordance with the waste management hierarchy. According to the waste management hierarchy, CSG derived brines in Queensland must be reused, recycled and/or recovered (in decreasing priority), in preference to considering disposal options, which is currently the general default position of the CSG industry. More specifically, according to the *Coal Seam Gas Water Management Policy 2012*[3], the first priority (Priority 1) for managing saline waste is for "Brine or salt residues are treated to create usable products wherever feasible". The same CSG policy further stipulates that the second priority (Priority 2) as follows, "After assessing the feasibility of treating the brine or solid salt residues to create usable and saleable products, disposing of the brine and salt residues in accordance with strict standards that protect the environment".

On this basis, based on the industry roadmap outlined in Master Plan and subsequent announcements, Parkway believes it is uniquely well-placed to provide BAT to the CSG industry in Queensland, an opportunity assessed to potentially be in excess of $15 billion over the life of existing CSG projects.

In addition to existing (operating) CSG projects, the industry continues to expand, with several significant additional investments into the Queensland CSG industry in recent months, including:

- On 26 June 2024, Senex Energy (owned by POSCO International and Hancock Prospecting) announced[4] it is moving ahead with a more than $1 billion expansion of its Atlas and Roma North natural gas developments in Queensland's Surat Basin.
- On 12 August 2024, Arrow Energy (Shell and PetroChina JV) announced[5] it was committing to a multibillion dollar phase 2 expansion of the Surat Gas Project, also in Queensland.

The announcement today that Parkway can further improve the product matrix for each CSG project through the innovative electrochemical processes, provides additional advantages for the innovative technology based approach proposed by Parkway.

Strategic Project Locations

Parkway is currently evaluating several strategically located project sites in Queensland in collaboration with existing and prospective clients as well as strategic partners. Potential sites under review include sites proximal to both upstream and downstream CSG operations, as well as locations close to key markets for the products anticipated to be produced through Master Plan related installations.

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[3] Coal Seam Gas Water Management Policy 2012, Department of Environment, Science and Innovation (DESI), Queensland Government: https://www.des.qld.gov.au/policies?a=272936:policy_registry/rs-po-csg-water-management-policy.pdf

[4] *Green light for Senex's $1 billion investment to boost domestic gas supply*, published 26 June 2024, available at: https://senexenergy.com.au/news/green-light-for-senexs-1-billion-investment-to-boost-domestic-gas-supply/

[5] *Arrow Energy Surat Gas Project North expansion to start in late 2024*, published 12 August 2024, available at: https://www.arrowenergy.com.au/media/media-releases/current-releases/arrow-energy-surat-gas-project-north-expansion-to-start-in-late-2024

Strategic Alignment

In addition to discussions with various CSG industry participants including project owners and/or operators, Parkway continues to engage with a wide range of industry stakeholders. During these discussions, Parkway has received interest from several potential partners and/or strategic investors interested in aligning themselves with various Master Plan related initiatives.

In order to ensure Parkway continues to build critical-mass and achieve strong alignment with key stakeholders, Parkway intends to launch a formal partnering process for QBS in coming months. Since the release of Master Plan, the extent of inbound interest has been very encouraging and highlights the strong alignment with both industry and the regulatory environment.

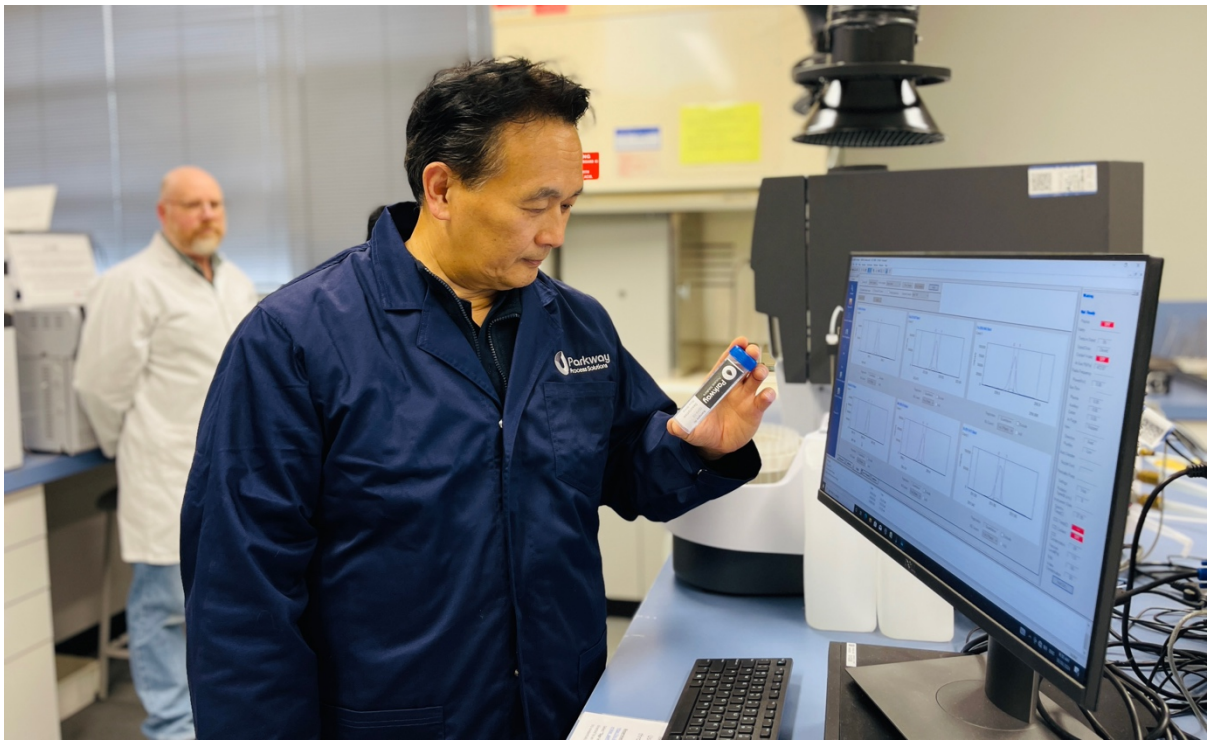
Strategic Inhouse Capabilities

Given the significant market opportunity for innovative brine processing technologies, in recent years, Parkway has systematically built an inhouse integrated technology platform suitable for the industrial-scale commercialisation of Parkway's portfolio of proprietary brine processing technologies.

This integrated technology platform is well placed to also support the commercialisation of the recently disclosed innovative electrochemical processes through a range of important capabilities, including the following:

- Process simulations – based on proprietary process simulation models developed inhouse.
- Piloting activities – performed at Parkway Centre for Brine Technologies and Victoria University.
- Scale-up – inhouse capabilities to support efficient scale-up of key unit operations.
- Design and engineer – inhouse process team ensures reliable performance & constructability.
- Fabrication – Tankweld Engineering[6] subsidiary provides experienced fabrication capabilities.
- Installation – Tankweld Installations[6] subsidiary provides Parkway with an experienced project installation and integrated project delivery capability.

Figure 4: Parkway Process Engineer Performing Sample Analysis – Victoria University Laboratory



[6] Tankweld Group, consisting of Tankweld Engineering Service Pty Ltd and Tankweld Installations Pty Ltd, was acquired by Parkway on 13 March 2024. https://cdn-api.markitdigital.com/apiman-gateway/ASX/asx-research/1.0/file/2924-02784107-6A1197958&v=fc9bdb61fe50ea61f8225e24ce041a0e155a9400

In summary, Parkway has assembled a fully integrated inhouse project delivery capability (refer *Figure 5*), including for the innovative process technologies being developed and commercialised by Parkway.

Figure 5: Platform of Integrated Water Treatment Related Capabilities

Additional details about Parkway's Integrated Water Treatment Solutions are available at the following location:

- https://pwnps.com/collections/integrated-water-treatment-solutions

COMMENTS FROM GROUP MANAGING DIRECTOR & CEO

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

"These exciting results from our latest electrochemical related R&D activities represent a major technology breakthrough for Parkway, with significant implications for industrial brine treatment. Despite the groundbreaking approach of our Master Plan released in June last year, the news we announce today highlights our relentless approach to pushing boundaries to develop the most efficient, effective and valuable process solutions, for industry.

In addition to being supported by our colleagues at Victoria University, our R&D efforts are underpinned by our inhouse process engineering team which includes highly experienced engineers that have held senior roles in leading global electrochemical technology companies, including chlor-alkali OEMs.

As an industrial technology company, we continue to invest heavily in R&D to ensure we remain at the cutting-edge of innovative brine processing technologies. In terms of investment, when taking contributions from our partners, grants funds, incuding from the Australian Research Council (ARC) as well as in-kind contributions into account, the value of our R&D activities performed in FY24 was in the order of $2 million. Whilst we achieve excellent financial leverage for our R&D investments, this is nonetheless a significant investment relative to the size of our market capitalisation and highlights our commitment to advancing our portfolio of innovative technologies. As part of our financial reporting obligations, we have recently finalised our research & development tax incentive (R&DTI) submission for FY24, which we expect to result in a $0.68 million refund later this month. We acknowledge and thank the Australian Government for continuing to support innovative Australian R&D through the R&DTI scheme.

Whilst Parkway has grown significantly in recent years, particularly following the recent acquisition of Tankweld, as the news announced today highlights, at our core, Parkway is an industrial process technology company. Development and commercialisation of innovative process technologies are our source of sustained competitive advantage and is where we create significant long-term value. As our core process technologies approach key commercialisation milestones, we expect to capture significant value from these technologies.

In parallel to our ongoing technology development activities, we are also making excellent progress in both our technology delivery related capabilities, as well as in relation to our broader go-to-market priorities. We are currently in discussions with several parties which we expect to be pivotal to the long-term success of our technology business, including in relation to our Master Plan related objectives.

We look forward to providing further updates regarding our continued progress."

The release of this announcement has been approved by Parkway's Group Managing Director & CEO, Bahay Ozcakmak, on behalf of the board of directors of the Company.

ADDITIONAL INFORMATION

For further information or investor enquiries, please contact:

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PARKWAY INVESTOR HUB

To stay up to date with the latest news, access additional investor related resources including research reports and interact with Parkway by posting questions and feedback through a Q&A function, we encourage investors to sign-up to the Parkway Investor Hub.

How to sign-up to the Parkway Investor Hub

1. navigate to https://investorhub.pwnps.com/welcome
2. follow the prompts to sign up for an Investor Hub account.
3. complete your account profile.

or Scan QR Code to visit the Parkway Investor Hub.

ABOUT PARKWAY CORPORATE LIMITED

Parkway is a leading Australian water & wastewater treatment and process technology company. Parkway is focused on the commercialisation of a portfolio of innovative process technologies in key industrial markets, as Parkway believes this is an important and effective strategy for addressing various global water related sustainability challenges.

In recent years, Parkway has made significant investments in groundbreaking research and development (R&D) related activities, including in the acquisition, development, validation and optimisation of a comprehensive portfolio of cutting-edge industrial water treatment related process technologies.

In support of Parkway's accelerated technology commercialisation strategy, Parkway primarily operates through two strategically integrated capacities:

- **Industrial Operations** business division is focused on the provision of conventional water and wastewater treatment related products & services, including fabrication as well as project delivery related services including installation, for a broad range of predominantly commercial, municipal and industrial clients.
- **Industrial Technology** business division is primarily focused on innovative process technology related R&D, including process screening, evaluation, optimisation and piloting, as well as a range of technology commercialisation related activities.

Integrated Capabilities

Parkway has assembled a fully integrated inhouse project delivery capability, including for the innovative process technologies being developed and commercialised by Parkway.

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

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.