



# ASX Announcement

01 December 2020

ASX: PWN  
FSE: 4IP

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## PARKWAY MINERALS UPDATED CORPORATE PRESENTATION

Parkway Minerals NL (ASX: **PWN**) (“**Parkway Minerals**” or the “**Company**”) is pleased to provide an updated Corporate Presentation outlining recent achievements, the growing opportunity for innovative process technologies, and further details about the corporate strategy of the Company.

On behalf of Parkway Minerals NL.

**Bahay Ozcakmak**

Managing Director

**This announcement has been authorised for release by Bahay Ozcakmak (MD) on behalf of the Board of Parkway Minerals NL.**

### Additional Information

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## aMES™ Technology

The *activated Mineral Extraction System*, or **aMES™** is an innovative process technology that enables the treatment of concentrated brine solutions to recover a range of valuable compounds, reagents and fresh water. The technology utilises a proprietary multi-staged process incorporating novel membrane technology and is based on proprietary IP, incorporating patents, expertise and know-how acquired over more than a decade of intense process development.

### **Advantages of the aMES™ technology include:**

- improvements in mineral recovery and product quality,
- opportunity for substantial project capex & opex savings,
- efficient use of energy and produces pure water as a by-product, and
- improved project footprint and environmental sustainability.

Ongoing collaboration with a number of brine project developers and operators has confirmed there are many applications where the aMES™ technology has the potential to deliver substantial value by enhancing existing flowsheets, in order to improve overall project performance.

### **Additional Information**

[www.parkwayminerals.com.au/ames-technology](http://www.parkwayminerals.com.au/ames-technology)

## iBC™ Technology

The *integrated Brine Causticization*, or **iBC™** is a patented process technology that simultaneously removes common impurities from waste brine streams and converts sodium carbonates and bicarbonates commonly found in coal seam gas (CSG) brines, into more soluble sodium hydroxide.

As a result of the causticization step, the iBC™ technology produces a purified brine suitable for downstream processing, including with the aMES™ technology, for the production of various salt products and industrial-grade sodium hydroxide.

### **Additional Information**

<https://www.parkwayminerals.com.au/ibc-technology>

## aMES™ Brine Processing Technology

### **Key Industries (Applications)**

- Mining natural brine (salt lakes)
- Solution mining brine (potash)
- Refinery & industrial waste brine
- Wastewater treatment brine

### **Target Products (Produced)**

- Potash (MOP/SOP/KMS)
- Lithium and magnesium salts
- Range of byproducts (B, Br, Ca, Co, Cu, I, Na, Ni, REE, Si, Sr)
- Reagents
- Water

## iBC™ Brine Pre-Treatment Technology

### **Key Industries (Applications)**

- Oil & gas waste brine (CSG)
- Wastewater treatment brine

### **Target Products (Produced)**

- Sodium hydroxide concentrate
- Sodium chloride
- Byproducts (Ca, Mg, Si)

## About Parkway Minerals

In October 2019, Parkway Minerals (ASX: PWN) completed a transformational transaction by acquiring an Australian unlisted public company, Consolidated Potash Corporation (CPC). Through CPC, Parkway Minerals acquired a minority interest in the Karinga Lakes Potash Project (KLPP) in NT Australia. The CPC transaction, also resulted in Parkway Minerals acquiring the innovative aMES™ technology, which has been developed to process a range of challenging brine streams from the mining industry, in order to recover valuable minerals, reagents as well as produce fresh water.

Given the significant market opportunities, Parkway Minerals is focused on commercialising a world-class technology portfolio to provide long-term sustainable solutions for processing complex brines, in the energy, mining and wastewater industries. In order to achieve this objective, Parkway Minerals is partnering with leading industry participants to provide, BPaaS – Brine Processing as a Solution™.

### Strategic Investment

Parkway Minerals holds a strategic investment in Davenport Resources (ASX: DAV), which has successfully delineated a globally significant in-situ potash resource (in excess of 550 million tonnes of contained potash), at its South Harz project in Central Germany. Recently completed scoping studies have delivered excellent technical and economic results and provide Davenport Resources with an attractive opportunity to create and unlock substantial value.

Parkway Minerals is commercialising a world-class technology portfolio to provide long-term sustainable solutions for processing complex brines, in the energy, mining and wastewater industries.

Our mission is to collaborate with leading strategic partners to deliver:

**BPaaS – Brine Processing as a Solution™**

### Forward-Looking Statements

This ASX Release may contain certain “forward-looking statements” which may be based on forward-looking information that are subject to a number of known and unknown risks, uncertainties, and other factors that may cause actual results to differ materially from those presented here. Where the Company 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. Forward-looking information includes exchange rates; proposed or projected project or transaction timelines; uncertainties and risks associated with the advantages and/or performance of the Company’s projects and/or technologies; uncertainties and risks regarding the estimated capital and operating costs; uncertainties and risks regarding any envisaged timelines in relations to any results, milestones, partnerships, including but not limited to any milestones which may require obtaining approvals from third parties.

For a more detailed discussion of such risks and other factors, see the Company’s other ASX Releases. Readers should not place undue reliance on forward-looking information. The Company does not undertake any obligation to release publicly any revisions to any forward-looking statement to reflect events or circumstances after the date of this ASX Release, or to reflect the occurrence of unanticipated events, except as may be required under applicable securities laws.



1 DECEMBER 2020

# CORPORATE Presentation

ASX: PWN

Brine Processing  
as a  
Solution

[parkwayminerals.com.au](http://parkwayminerals.com.au)

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All securities transactions involve risks which include, among others, the risk of adverse or unanticipated market, financial or political developments.

Certain statements contained in this presentation, including information as to the future financial, technical, commercial or operating performance of Parkway Minerals NL ('Parkway Minerals' or 'the Company') and its projects and technologies, are forward-looking statements. Such forward-looking statements are necessarily based upon a number of estimates and assumptions that, while considered reasonable by Parkway Minerals, are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies, involve known and unknown risks and uncertainties that could cause actual events or results to differ materially from estimated or anticipated events or results reflected in such forward-looking statements, and may include, among other things, statements regarding targets, estimates and assumptions in respect of proposed or projected project or transaction timelines, uncertainties and risks associated with the advantages and/or performance of the Company's projects and/or technologies, commodity and product production rates and prices, operating costs and results, capital expenditures, ore reserves and mineral resources and anticipated grades and recovery rates, and are or may be based on assumptions and estimates related to future technical, economic, market, political, social and other conditions including the satisfactory performance of certain technologies developed and/or acquired by Parkway Minerals, and uncertainties and risks regarding any envisaged timelines in relation to any results, milestones, partnerships, including but not limited to any milestones which may require obtaining approvals from third parties. Parkway Minerals disclaims any intent or obligation to update publicly any forward-looking statements, whether as a result of new information, future events or results or otherwise. The words 'believe', 'expect', 'anticipate', 'indicate', 'contemplate', 'target', 'plan', 'intends', 'continue', 'budget', 'estimate', 'may', 'will', 'schedule' and other, similar expressions identify forward-looking statements. All forward-looking statements made in this presentation are qualified by the foregoing cautionary statements. Investors are cautioned that forward-looking statements are not guarantees of future performance and, accordingly, investors are cautioned not to place undue reliance on forward-looking statements due to the inherent uncertainty therein. Many known and unknown factors could cause actual events or results to differ materially from estimated or anticipated events or results reflected in such forward-looking statements. Such factors include but are not limited to: competition; mineral prices; ability to meet additional funding requirements; exploration, development and operating risks; new technology development and commercialisation related risks; uninsurable risks; uncertainties inherent in ore reserve and resource estimates; dependence on third-party infrastructure facilities; factors associated with foreign operations and related regulatory risks; environmental regulation and liability; currency risks; effects of inflation on results of operations; factors relating to title to properties; native title and Aboriginal heritage related issues; dependence on key personnel, and share price volatility. They also include unanticipated and unusual events, many of which it is beyond the Company's ability to control or predict.

## **KARINGA LAKES POTASH PROJECT (KLPP) – MINERAL RESOURCES**

### COMPETENT PERSONS STATEMENT

The information in this announcement that relates to Exploration Results and Mineral Resources for the Karinga Lakes Potash Project is based on, and fairly represents, information compiled by Mr Ben Jeuken, who is a member of the Australian Institute of Mining and Metallurgy and a member of the International Association of Hydrogeologists. Mr Jeuken is employed by Groundwater Science Pty Ltd, an independent consulting company. Mr Jeuken has sufficient experience, which is relevant to the style of mineralisation and type of deposit under consideration and to the activity, which they are undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Jeuken consents to the inclusion in the report of the matters based on his information in the form and context in which it appears.

Parkway Minerals confirms that it is not aware of any new information or data that materially affects the information included in the original market announcement dated [5 November 2020](#). Parkway Minerals confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from the original market announcement.



# Overview

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# About Us

## About us

- We are an experienced industrial process technology team, focused on addressing high concentration feedstock and wastewater related challenges, in the energy, mining and wastewater industries.

## What problems are we solving?

- Recovery of minerals and reagents from concentrated feedstocks and wastewater streams, to achieve **improved financial & sustainability outcomes**.

## What we do?

- We are commercialising a world-class technology portfolio to provide long-term sustainable solutions for processing complex brines, in the energy, mining and wastewater industries.

## What are our technologies?

- aMES<sup>™</sup> - brine processing technology
- iBC<sup>™</sup> - brine pre-treatment technology
- undisclosed – synergistic technologies (developed and acquired)
- undisclosed – synergistic technologies (various, under evaluation)

## Where are we on the commercialisation journey?

- Advanced commercialisation, with R&D substantially complete, approaching key deployment phases, refer to Technology Readiness Level graphic.

## How do we make money?

- Short-term – cost-recovery from piloting, engineering and feasibility studies.
- Medium-longer term – upfront licensing fees, ongoing royalties & services.



*Industrial process technology team*



*Economic processing of wastewater*



*Commercialising world-class technology*



*Portfolio of valuable proprietary technologies*

*Technology Readiness Levels (TRL's)*



*Capture material share of value creation*

# Corporate Snapshot

As of 30 November 2020

Capital Structure	Current
Ordinary Shares (PWN) on issue	1,900,753,983
12-month Trading Range	\$0.003 - \$0.015
<b>Market Capitalisation (at \$0.010)</b>	<b>\$19 million</b>
Partly Paid Shares (PWNCA, \$0.019 unpaid)	246,600,643
Unlisted Options (\$0.02, 16 Dec 2022)	303,166,664

Major Shareholders	%
Lions Bay Capital (LIC)	11.7%
Holdings associated with MD	11.5%
Other T20 Shareholders	~28%
<b>Top 20</b>	<b>~51%</b>

Funding	\$
Debt	nil
Cash (at 30 Sep 2020)	\$1.55 million
<b>Unaudited – Cash (at 29 Nov 2020)</b>	<b>\$2.78 million</b>

Strategic Investment	Value (\$A)
34,267,700 units ASX: DAV @ \$0.052	\$1.78 million
7,142,850 units ASX: DAVO \$0.004	\$0.07 million
<b>Marketable Securities - Total</b>	<b>~\$1.85 million</b>

## EXPERIENCED AND MOTIVATED TEAM

### 1) Experienced Team

- Strong industry and **technology commercialisation experience**.
- Track-record of licensing technologies and completing value accretive transactions.

### 2) Strong Alignment

- Board, management and engineering team **are aligned with shareholders**, given share/option ownership.
- Insiders and associates control significant proportion of share register.
- Company is operated with an “owner’s mindset”, with tight cost control and reluctance to dilute shareholders unless linked to significant value accretive initiative/s.

### 3) Generating Corporate & Strategic Traction

- Being approached by prospective partners and clients, as well as credible sophisticated and **institutional investors** that have experienced success in the innovation, junior tech, water-tech space, interested in exploring strategic opportunities.

### Directors & Management

**Adrian Griffin** – NE Chairman

**Bahay Ozcakmak** – MD

**Richard Beresford** – NED

**Patrick Power** – NED

**Robert van der Laan** – CFO

**Amanda Wilton-Heald** – CoSec.

### Stock Symbols



ASX:  
**PWN**



Frankfurt:  
**4IP**

Join us on our journey, by following us on [LinkedIn](#).



# What is ESG?

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**Environmental, social and governance (ESG) criteria are a set of standards for a company's operations that socially conscious investors use to screen potential investments:**

- Environmental criteria consider how a company performs as a steward of nature.
- Social criteria examine how it manages relationships with employees, suppliers, customers, and the communities where it operates.
- Governance deals with a company's leadership, executive pay, audits, internal controls, and shareholder rights.

In recent years, as **investors are increasingly eager to invest their money in line with their values**, the ESG investment universe, has grown significantly.

**ESG is increasingly recognised as one of the most significant forces shaping investment decisions, a trend that is anticipated to accelerate in coming years.**

# Water – A Growing ESG Challenge

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“Whilst momentum to address climate change has undoubtedly accelerated in recent times, **the challenges associated with access to freshwater and disposal of wastewater, arguably, represent a more significant near-term threat to society.**”

“Once the broader investment community comes to grips with this macro thematic, particularly in the context of ESG investing, I expect we will see **enormous interest in the water technology sector**, not dissimilar to what is happening with EV’s, hydrogen and other promising technologies.”

“At Parkway Minerals, we are positioning ourselves, to ensure we are a **major beneficiary of what we consider to be an inevitable outcome**, in terms of increased interest in next-generation technologies, to address what many consider to be an existential challenge.”



**Bahay Ozcakmak**

MANAGING DIRECTOR  
PARKWAY MINERALS

# Water – A Growing ESG Challenge

## Overview

- Increasing demand for freshwater, and reduced tolerance for wastewater generation and storage, is creating opportunities for new wastewater processing technologies.

### i) Water Crisis

Global population growth and rapid economic development is putting pressure on limited freshwater resources with:

- ~1.1 billion people worldwide lacking access to water.
- ~2.7 billion find water scarce for at least one month of the year.

### ii) Competing Uses for Water

- The agriculture, energy and mining sectors are amongst the largest consumers of water, globally.
- Access to freshwater is becoming increasingly challenging.

### iii) Need for Improved Sustainability

- It is estimated that, **less than 5%** of liquid wastes from the **mining industry** undergo any form of processing to **recover freshwater**.
- Permitting new mines (and operation of existing mines) that require freshwater is increasingly complex and challenged.

### iv) Desalination Plants

- Rapidly growing market to meet major global water challenges.
- The ~16,000 operating desalination plants produce more than **140 million cubic metres (m<sup>3</sup>) of waste brine, daily**.



## The Basis of Water Sustainability

- Reduce** – use of water efficiency technologies
- Reuse** – requires capturing waste streams
- Recycle** – requires processing of wastewater

## Recycling Water

- Water recycling provides the greatest opportunity to concurrently:
  - Reduce wastewater storage, and;
  - Recover freshwater
  - Converting a liability into an asset**

## Total Dissolved Solids (TDS, salts) in Feedwater & Wastewaters

- Low TDS - feedstocks are generally readily recycled with conventional desalination technologies, primarily reverse osmosis (RO).
- High TDS – feedstocks, from industrial operations, including in the energy, mining and fast-growing desalination sector produce over **250,000,000m<sup>3</sup> of concentrated brine, daily**.
  - Conventional technologies for processing these high-TDS brine streams are inefficient and costly.

## Innovative Processing Technology

- Opportunity to process high TDS brine streams.

# 2020 The World Has Changed

## We Are Living at a time of Major Global Upheaval

- Globalisation, has underpinned economic growth, but is now being challenged.
- Technological disruption, is providing unprecedented economic opportunities.
- The world has changed - The pandemic is also creating opportunities & challenges.
- Changes leading to increased inequality, with impacts accelerated by the Covid-19.



## Implications

- Whilst there are various interpretations (even conspiracies) on what “build back better” means, regardless, there is an increased focus on ESG principles.
- Parkway Minerals is well placed to respond to some of the environmental sustainability related challenges, through next-generation technologies.

## Impact on Investment Allocations

- The majority of post-pandemic initiatives to support economic development, are focused on ESG-centric themes in order to “build back better”.
- Professional investments are also increasingly ESG focused, as non-compliance is seen as a risk.

### ESG-mandated assets could make up half of all managed assets in the United States by 2025

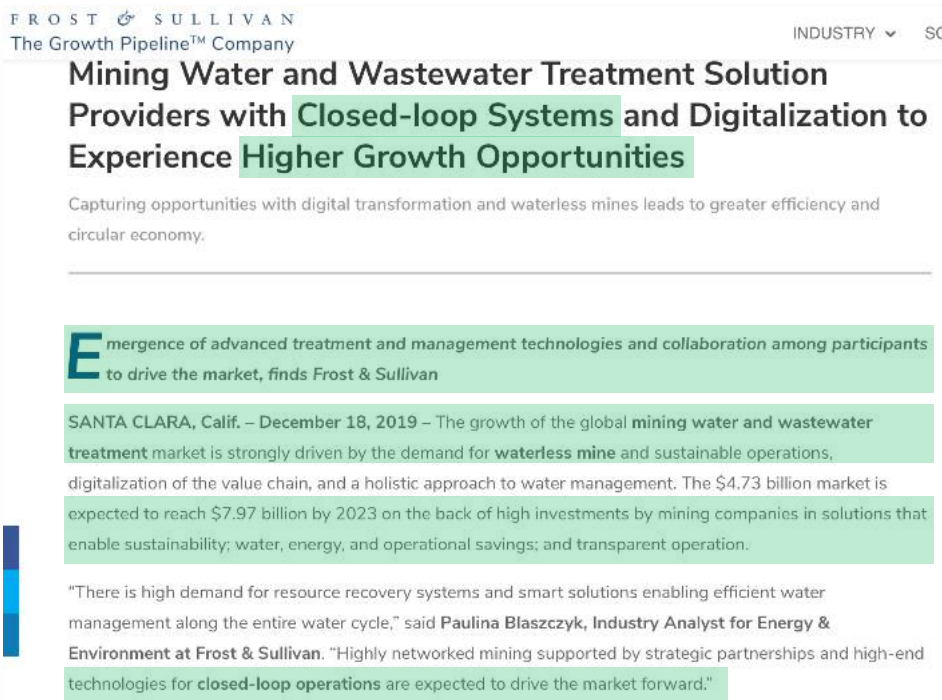


Source: US SIF Foundation data through 2018; Deloitte Center for Financial Services analysis through 2025.  
Deloitte Insights | deloitte.com/insights

# Emerging Challenges – Creating Opportunity

## Before Covid-19 (the “old” world)

- As outlined in a recent Frost & Sullivan report (Dec 2019), significant efforts to improve the efficiency of water use, including the concept of a “waterless mine” were underway, well before the emergence of the Covid-19 pandemic.



FROST & SULLIVAN  
The Growth Pipeline™ Company

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### Mining Water and Wastewater Treatment Solution Providers with Closed-loop Systems and Digitalization to Experience Higher Growth Opportunities

Capturing opportunities with digital transformation and waterless mines leads to greater efficiency and circular economy.

**E**mergence of advanced treatment and management technologies and collaboration among participants to drive the market, finds Frost & Sullivan

SANTA CLARA, Calif. – December 18, 2019 – The growth of the global mining water and wastewater treatment market is strongly driven by the demand for waterless mine and sustainable operations, digitalization of the value chain, and a holistic approach to water management. The \$4.73 billion market is expected to reach \$7.97 billion by 2023 on the back of high investments by mining companies in solutions that enable sustainability; water, energy, and operational savings; and transparent operation.

“There is high demand for resource recovery systems and smart solutions enabling efficient water management along the entire water cycle,” said Paulina Blaszczyk, Industry Analyst for Energy & Environment at Frost & Sullivan. “Highly networked mining supported by strategic partnerships and high-end technologies for closed-loop operations are expected to drive the market forward.”

## Rapidly Growing Market

- Expected to reach US\$8 billion a year by 2023.
- High-end (emerging) technologies for “closed-loop” operations.

## After Covid-19 (the “new” world)

- The impacts of Covid-19 include the **acceleration of a number of existing transformation trends**, particularly trends relating to the adoption of ESG principles.
- Many of the “industry best practices” from the “old world”, are now no longer acceptable in the “new world”.

## Capital - as a “force for good”

- Global momentum is shifting towards “net zero emissions” and other major sustainability commitments.
- Institutional investors are recognising that poor ESG performance represents a material long-term risk, and are reallocating capital, accordingly.
- Providers of capital (investors) are demanding ESG improvements.
- CEO of Worley, describes these changes as follows:

### FINANCIAL REVIEW

Jenny Wiggins  
Infrastructure reporter  
Oct 9, 2020 - 12:00am

## 'Capital is getting a conscience': Worley CEO's new approach

The global engineering group used to focus on oil and gas, but new chief executive Chris Ashton says its future lies in 'delivering a more sustainable world'.



Worley CEO Chris Ashton in his home office in Houston.



# The Mining Industry at a Crossroads

## Exclusive: Germany's Volkswagen and Daimler push for more 'sustainable' Chile lithium

Dave Sherwood



SANTIAGO (Reuters) - German automakers Volkswagen (VOWG\_p.DE) and Daimler (DAIGn.DE) have launched a study to push for more "sustainable" lithium mining in Chile, according to lobbyist filings reviewed by Reuters, a sign of growing supply chain concerns ahead of an expected electric vehicle boom.



"Tesla will give you a giant contract for a long period of time if you mine nickel efficiently and in an environmentally sensitive way."  
Elon Musk, 22<sup>nd</sup> July 2020



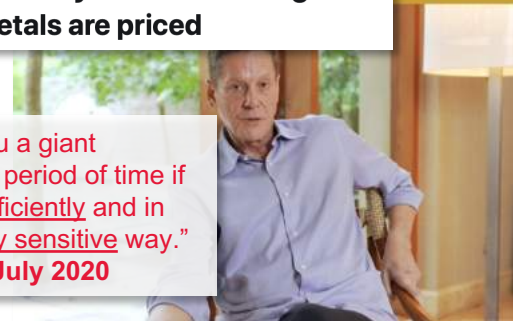
**Minjing Journal**  
Edition ▾  
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### Friedland: Carbon footprint will be priced into copper

Robert Friedland, executive co-chair of Ivanhoe Mines, says the carbon footprint of copper production will eventually be priced into copper, enabling buyers to better evaluate how much the metal contributes to the environmental impact of

miningnews.net

## Friedland says ESG will change the way metals are priced



## Emerging Challenges

- Mining operations are increasingly accountable for their "externalities" such as:
  - Depletion and/or contamination of **water resources**, and
  - Carbon footprint and even downstream implications, of mineral utilisation.
- Mining activities, subject to adopting **sustainable resource exploitation strategies**.



**ELSEVIER**

The Extractive Industries and Society  
Volume 7, Issue 2, April 2020, Pages 263-266

Viewpoint

## Mining needs new business models

W. Scott Dunbar <sup>a</sup>, Jocelyn Fraser <sup>a, b</sup>, Andy Reynolds <sup>c</sup>, Nadja C. Kunz <sup>a, b</sup>

Show more ▾

<https://doi.org/10.1016/j.exis.2019.07.007> [Get rights and content](#)

## Highlights

- A growing population and a desire for decarbonisation is driving mineral demand.
- At the same time, mining is confronted with technical and social challenges.
- Current business models are not suited to this social and technical complexity.
- New business models are needed to deliver value to mining and society.

## Implications

- Mining companies will have to share benefits and **pay the "true cost" of their operations, including for water**.
- UBC Journal publication can be accessed at: <https://doi.org/10.1016/j.exis.2019.07.007>



# The Mining Industry & Water Challenges

## Fitch Ratings

NON-RATING ACTION COMMENTARY

### Water Scarcity Is Greatest Risk to Metals and Mining

Wed 08 Jul, 2020 - 5:21 am ET

**Related Fitch Ratings Content:** [Increasing Water Risks in Metals and Mining - Low-Carbon Technology Supply Chains Face Growing Constraints](#)

Fitch Ratings-London-08 July 2020: The 2020 metals and mining survey, 'Emerging ESG Risks in the Metals and Mining Value Chain' - a collaboration between Fitch Ratings and CRU - highlighted water scarcity as the greatest emerging risk to the metals and mining sector, according to investors. Pressures such as localised water shortages and competition for water are likely to increase in the coming decades, causing increasing challenges for battery and low-carbon technology production.

Mining often faces operational risks with regard to water supply, and is one of the most water-intensive industries. Although efforts have been made to increase the efficiency with which the industry uses water, more and worse droughts and greater competition for water resources are posing growing challenges. The industrial utilisation of water is often constrained before the water demands of other sectors, such as agriculture.

Overall demand is forecast to rise by as much as fivefold for some metals by 2025, according to CRU, driven by increased applications in batteries, renewable energy and other green technologies. However, there are growing social and environmental constraints on production that threaten to make many projects unviable in the coming years. These may begin to disrupt dependent supply chains and products - a particular concern given the time and costs required to develop large-scale solutions such as desalination and wastewater recycling.

A major emerging concern for the sector is the management of mine tailings and its storage in tailings dams. A number of high-profile mine disasters from tailings dams highlight the need for the

### Key Points

- Overall **water demand is forecast to rise by as much as 500%** for some metals by 2025, driven by increased applications in batteries, renewable energy and other green technologies.
- However **growing ESG constraints** on production that threaten to make many projects unviable in coming years.
- Water scarcity is the **greatest emerging risk** to the metals and mining sector.
- Compounding water challenges, **wastewater storage** in tailings dams is accounting for a **growing portion of total operating costs**.

When a major credit ratings agency outlines material risks to a sector, it's worth paying attention.



Failure to act, will increase funding costs and eventually render certain assets/companies un-investable, particularly for institutional investors.

### The Only Viable Solution



Is to ensure the more efficient use of water, which requires the development and adoption of **fit-for-purpose technologies** which:

1. Enable more water efficient operations / mineral processing, and
2. Recycling of wastewater from operations.

OUR

parkway  
MINERALS

FOCUS

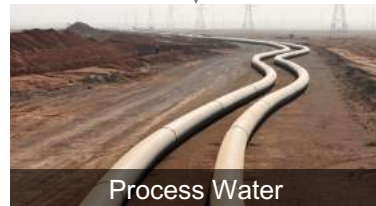
For more information:

<https://www.fitchratings.com/research/infrastructure-project-finance/water-scarcity-is-greatest-risk-to-metals-mining-08-07-2020>

# Mining Sector Wastewater Treatment Opportunities



**Waste Brine**  
- chemicals  
- salt  
- water



**Brine Feedstock**  
- minerals  
- salt  
- water



**Waste Stream**  
- minerals  
- reagents  
- water

## Desalination Waste Brine\*

- For every litre of freshwater output, desalination plants produce on average 1.5 litres of brine.
- World's ~16,000 desalination plants discharge **142 million m<sup>3</sup>/day of brine daily**.
- Brine management can represent up to 33% of a desalination plant's cost and ranks among the biggest constraints to more widespread development.
- Almost 22 million m<sup>3</sup>/day of brine is produced at a distance of greater than 50km from the nearest coastline. Despite the large volume of brine produced in these areas, **very few economically viable and environmentally sound brine management options exist**.

## Brine Mining Feedstock

- Primary brine projects include playa hosted brines to produce predominantly potash and lithium.
- Solution mining (ISL/ISR) techniques are also utilised to produce potash and other valuable mineral products.

## Tailings Waste Streams

- Typically have a large footprint and represent substantial environmental risks including community concerns.
- Tailings storage facility (TSF) construction, operation and maintenance represent significant costs and risks.
- Treatment of tailings solutions is a high growth sector.

\* Adapted from: "UN Warns of Rising Levels of Toxic Brine as Desalination Plants Meet Growing Water Needs", UNU-INWEH Study (14 Jan 2019).

# The Go To Market Plan – To Capture Opportunities

## Strategic Foundations

- **Recent Achievements - Technology**
  - Established high-calibre process engineering team.
  - Broadened and deepened technology portfolio:
    - Advanced aMES<sup>TM</sup> technology
    - Acquired iBC<sup>TM</sup> technology
    - Developing/acquiring synergistic technology
  - Advanced technology portfolio:
    - Completed KLPP-PFS
    - Pre-commissioning of aMES<sup>TM</sup> pilot plant underway
- **Recent Achievements – Project Delivery Capability**
  - Global Strategic Cooperation Agreement with Worley
  - Other strategic relationships/partners/OEM's

## Well Funded

- Strong balance sheet, with near-term funding of >\$5 million consisting of \$2.8M cash, \$1.9m marketable securities as well as additional funding from R&D refund and grant funds.
- Access to additional “growth-capital”, for accretive initiative/s.

## Legacy Assets

- Strategically important assets in the near-term, however, likely to be divested in the medium-term:
  - Karinga Lakes Potash Project (equity interest)
  - Davenport Resources (strategic investment)



## Our Mission

- To be recognised as a **technology solution provider of choice**, in relation to addressing high concentration feedstock and wastewater related challenges, in the energy, mining and wastewater industries.

## Near-Term Goals

- Advancing Brine Processing as a Solution (BPaaS<sup>TM</sup>) platform:
  - Ongoing pilot plant studies supporting active business development.
  - Presenting initial proposals for concept and/or feasibility studies.
- Acquire and/or build small-scale, high ROI, project delivery capability, based on conventional processes.

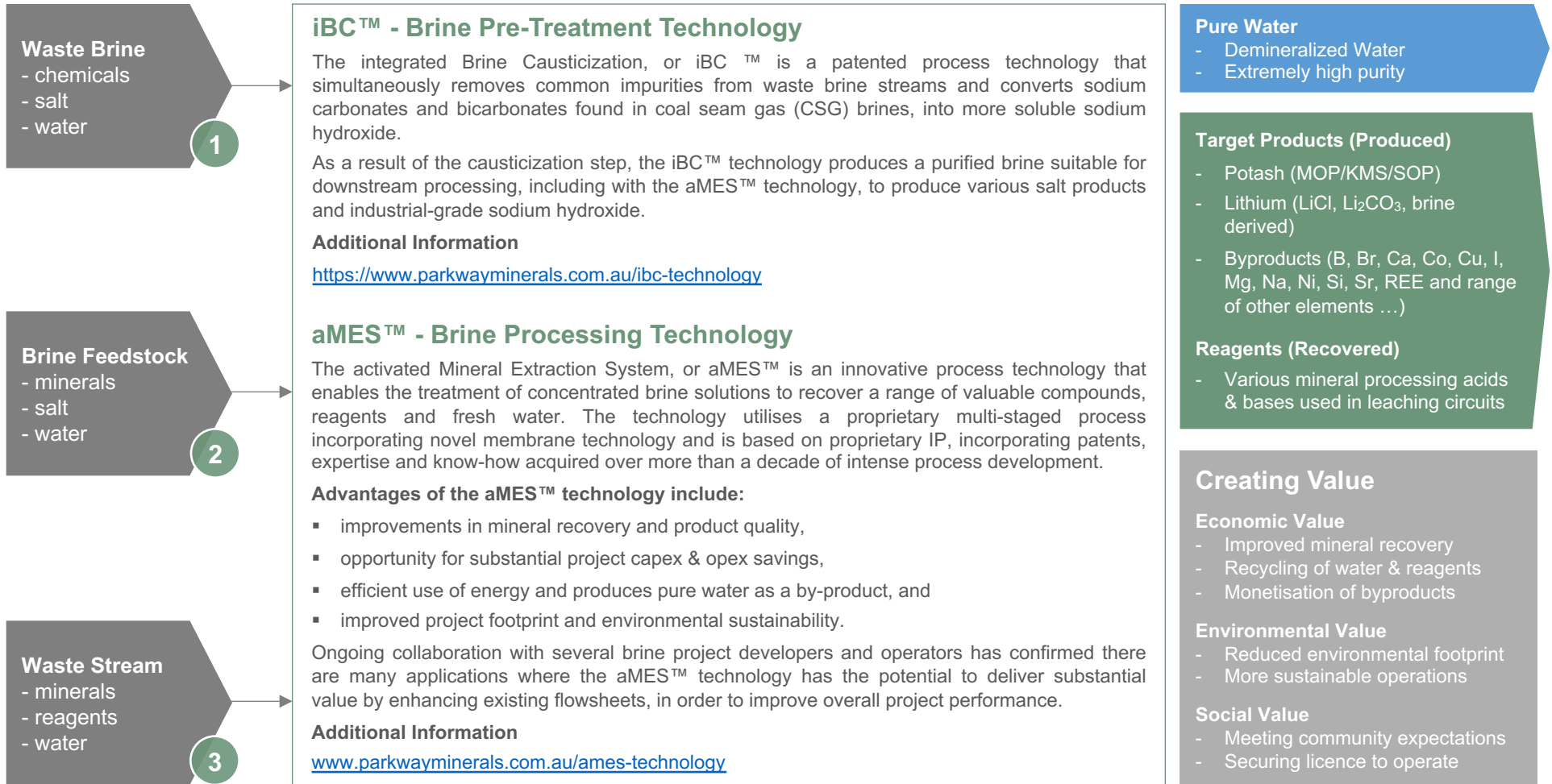
## Medium-Term Goals

- Generate revenue from:
  - Feasibility & piloting studies, licensing & royalty fees from technology portfolio.
  - Project delivery and professional services.
- Divest legacy assets and redeploy capital for growth.

## Long-Term Goals

- To provide technology & support for a portfolio of (non-owned) next-generation wastewater processing plants.
- Generate cash flow to enable payment of dividends.

# Creating Value Through Brine Processing Technologies



# Developing Next Generation Technologies

## Overview

- Whilst mining is essential for the clean-energy transition, society is demanding more sustainable sources of mined materials.
- Leading supply chain participants are demanding increasing transparency including through industry stewardship schemes such as IRMA.
- As miners seek to improve the sustainability of water use across operations, **Parkway Minerals well placed to be part of the solution.**
- The Parkway Minerals technology portfolio builds on more than a decade of cutting-edge research & development.



ARC RESEARCH HUB  
ENERGY-EFFICIENT SEPARATION



Australian Government  
Australian Research Council



## ARC-EESep – Energy Efficient Separation (ARC Hub)

- Activated Water Technologies (AWT), a wholly-owned subsidiary of Parkway Minerals, is a founding member of the ARC-EESep hub.
- The aim of the ARC hub is to develop more energy-efficient, cost-competitive and environmentally sustainable separation technologies.
- MD of Parkway Minerals, serves on the industry advisory panel.
- The hub consists of a world-class team incorporating 8 leading Australian universities, 3 international universities, and 20 industry partners including:



## IRMA – Initiative for Responsible Mining Assurance

- Parkway Minerals is a member of IRMA, the Initiative for Responsible Mining Assurance. We support the vision of a world where the mining industry respects the human rights and aspirations of affected communities, provides safe, healthy and supportive workplaces, minimizes harm to the environment, and leaves positive legacies.
- Parkway Minerals is featured on the Responsible Mining Map developed by IRMA.
- IRMA has developed a comprehensive global standard, supported by major mining industry stakeholders, including:

BMW  
GROUP



ArcelorMittal

Microsoft

AngloAmerican



# Innovative Process Technology Delivery Platform

High Value – Brine/Feedstock Processing Opportunities

## High Value Applications



- Very large addressable markets
- Well placed to be part of the **long-term solution** for processing **complex brines**
- Existing industry relationships
- Ongoing business development – both in-house and through partners

## Unique Technology Portfolio



- Portfolio of proprietary process technologies include:
  - iBC<sup>TM</sup>
  - aMES<sup>TM</sup>
  - ongoing R&D
- Technologies provide a **clear value proposition**, where mature low-cost alternatives do not exist

## Proprietary Process Solutions



- In-house process engineering team
- State-of-the-art process design and simulation capabilities
- Technoeconomic models to support **business-case development**
- In-house scoping studies support project evaluation

## Technology Solution Validation



- Capacity to rapidly **validate process performance** at a range of scales from benchtop through to larger **pilot plants**
- Process piloting supports feasibility studies
- Pilot plants installed at Victoria University

## Project Feasibility & Delivery



- Strong EPC support from **global engineering company**, underpins commercialisation of aMES<sup>TM</sup> technology
- Capacity to deliver tier-1 feasibility studies & EPC/M
- innovative revenue sharing model

### STRATEGIC PARTNERSHIPS



Strategic Collaboration Agreement to develop, optimise and commercialise brine technology

### Technology Optimisation

### Established Relationships

Strong relationships with key equipment (OEM) vendors and other partners important in successful project development and technology delivery

### Technology Commercialisation



Global Strategic Cooperation Agreement to commercialise aMES<sup>TM</sup> technology

## BPaaS - Brine Processing as a Solution<sup>TM</sup>



Parkway Provides  
Process Technology Package

Partners Deliver  
Integrated Process Technology Solution

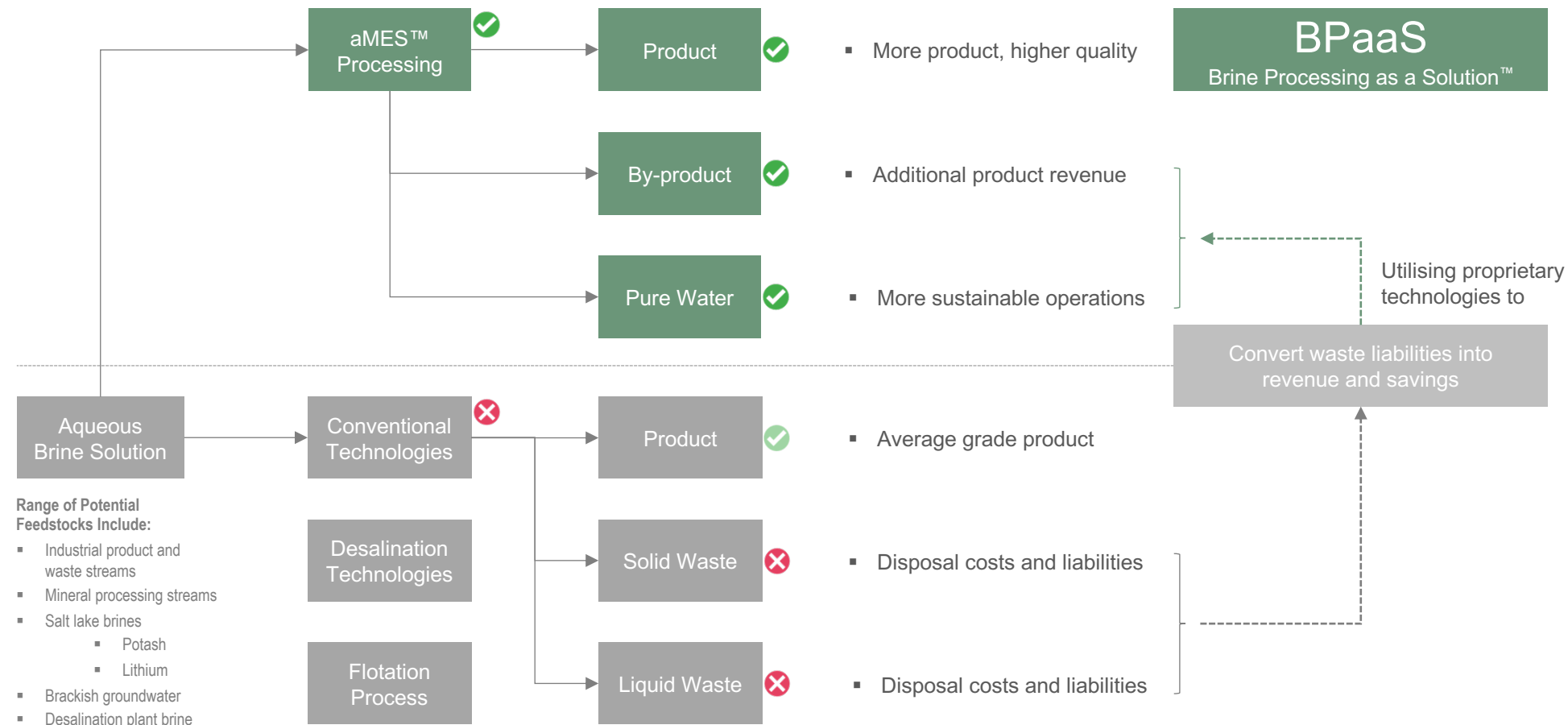
Innovative Business Model



# Advantages of Brine Processing as a Solution

## In Simple Terms

- The BPaaS technology offering, enables the conversion (processing) of otherwise waste brine and salt streams, into additional product (**by-product revenue**) and improved environmental sustainability (**savings from disposal related costs**). A more detailed explanation is provided in *Appendix 1B*.



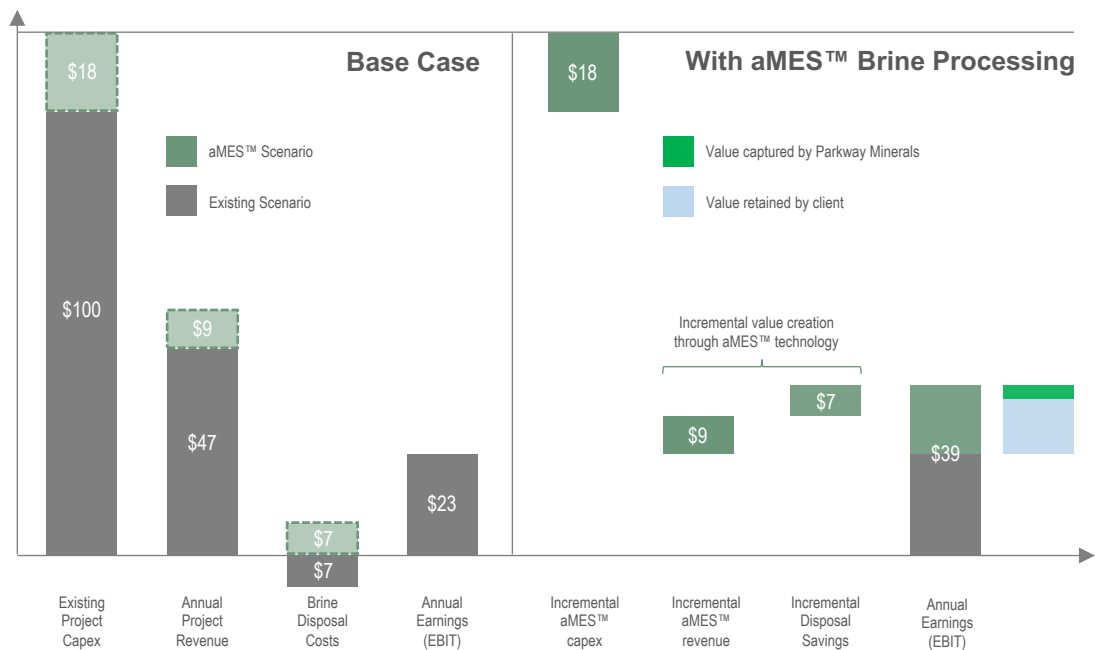
# Innovative Business Model – Leveraging Technology

## Leveraging Technology

- Through the innovative process technology delivery platform, Parkway Minerals is in the process of establishing itself as a leading **brine technology solution provider**.
- Enabling Parkway Minerals, together with its strategic partners, to offer:
  - BPaaS** – Brine Processing as a Solution™.

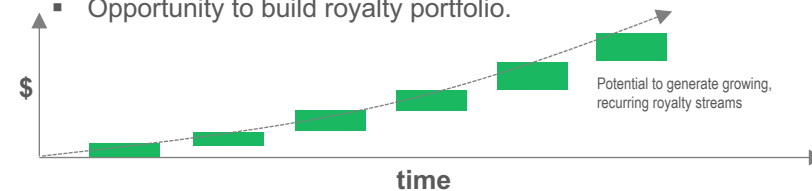
## Creating Sustainable Value

- Focus on large, high-value, brownfield opportunities, requiring process improvement.
- Clear value proposition based on processing concentrated waste brine streams.
- Processing reduces waste disposal costs, generates revenue and improves ESG.



## Illustrative Case-Study – Conceptual

- Incremental capex for aMES™ plant has short payback (<3yr).
- Significant return on invested capital (ROIC), particularly for incremental capex, enables a **modest royalty (5-20%)** to be justified, given the client is sharing incremental value creation.
- Feasibility study related costs and project capex to be incurred by the client, with the aim of Parkway Minerals recovering all business development and evaluation related costs.
- Upfront and **recurring royalties are highly value accretive** to Parkway Minerals, given significant investment is not required.
- Opportunity to build royalty portfolio.

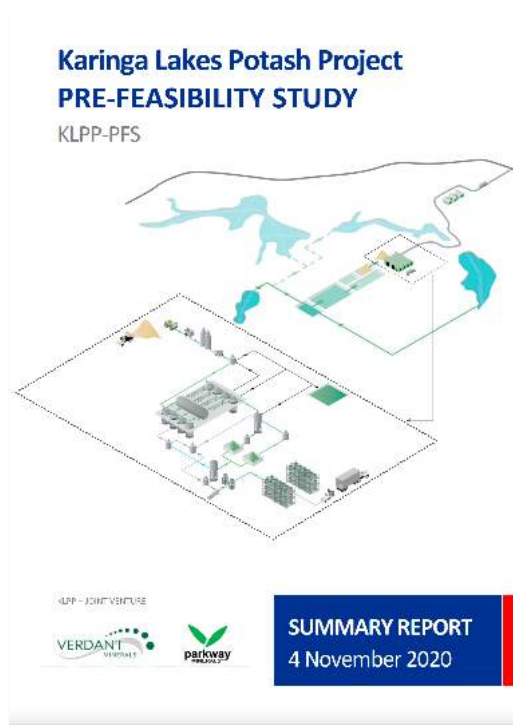


IMPORTANT NOTE: The descriptions, graphics and numbers outlined on this slide are conceptual in nature and do not relate to specific projects and/or opportunities, do not represent any form of financial forecast by the Company whatsoever, and should not be relied on for any purpose. Refer to the Disclaimer slide (page 2) for further information.

# Karinga Lakes Pre-Feasibility Study (KLPP-PFS)

## Introduction

- Parkway Minerals owns 15% (acquiring 40%) of the Karinga Lakes Potash Project (KLPP) in the Northern Territory, Australia.
- A recent Pre-Feasibility Study (KLPP-PFS) demonstrated the significant advantages of developing the sulphate of potash (SOP) brine project, with the aMES™ technology.



KLPP-PFS Project supported by:



## Completion of KLPP-PFS - announced on 5 Nov 2020

- Innovative aMES™ based flow sheet demonstrates the **significant advantages of the aMES™ technology**, over conventional technologies.

## Key Advantages

- LESS WATER requires half as much as peer group (potentially, as low as quarter)
- LOWER CAPEX significantly lower compared to prior scoping study
- LOWER OPEX lower than scoping study; scope to improve further
- VERSATILE flexible flow sheet capable of producing range of by-products
- NO REAGENTS does not require reagents – thereby improving sustainability
- HIGHER PURITY higher purity products and recoveries generates more revenue

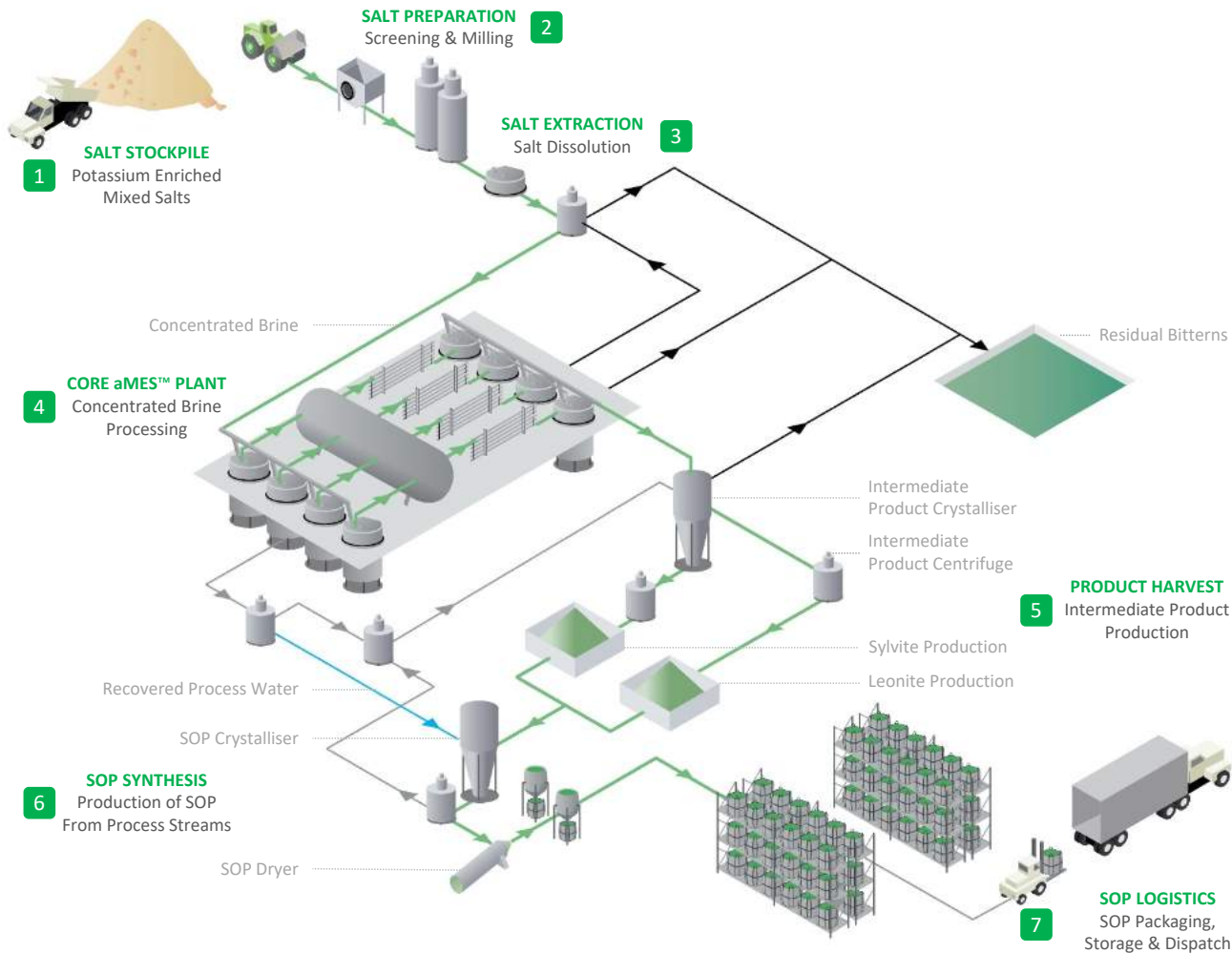
## Implications

- Successful demonstration of **technoeconomic advantages of aMES™**
- Forms basis for evaluating larger & more advanced projects
- Very strong capability development through KLPP-PFS
- Key milestone in commercialising the aMES™ technology

## Additional Information

- For more details about the [KLPP](#) (at Parkway Minerals website)
- For more details about the [KLPP-PFS](#) (to download summary report)

# Karinga Lake Pre-Feasibility Study (KLPP-PFS)



## Pre-Feasibility Study

- The KLPP-PFS confirms the KLPP as a potentially attractive producer of high-quality, soluble grade, sulphate of potash (SOP).
- Innovative aMES™ based flow sheet demonstrates potential (major improvement over scoping study), even for a relatively small-scale operation targeting annual SOP production of 40,000 tonnes, over an initial mine life of 20 years.
- aMES™ based development concept demonstrates highly efficient use of water.

## KEY FINANCIAL METRICS

- Initial capital cost (CAPEX) of \$80.0 million, inclusive of all non-process infrastructure and indirect costs (which includes a contingency of \$6.7 million).
- Production cost (OPEX) of \$293/tonne of SOP, ex-mine gate.
- Strong cash generation potential, with estimated EBITDA margin of 54.4%, resulting in annual EBITDA of \$18.6 million.
- Ungearing development of the KLPP would result in:
  - Project payback in approximately 5.5 years from first SOP production.
  - Post-Tax NPV<sub>8%</sub> of \$80.15 million with an IRR of 20.4%.

# State-of-the-Art aMES™ Pilot Plant

## Overview

- The new, large-scale aMES™ pilot plant provides important process demonstration and optimisation capabilities.

## Status

- Mechanical installation of the new aMES™ pilot plant was recently completed, with pre-commissioning related activities currently underway, as announced on [16 Nov 2020](#).

## Forward Plan

- The aMES™ pilot plant will commence staged commissioning process, shortly, as part of a broader process piloting campaign.
- Commissioning will commence with a potassium enriched mixed salt from the Karinga Lakes Potash Project (KLPP).
- Subsequent testwork involving the aMES™ pilot plant, will include feedstock from third-party projects, providing Parkway Minerals with an important process demonstration, optimisation and validation capability, **an essential requirement for successful commercialisation.**





# Indicative Profile of Potential Project Solutions

## Overview

- Targeting large projects with highly problematic liquid waste streams. A selection of projects currently under evaluation, are outlined below.

### Project A

- Owner:** major global mining company
- Asset:** mine and refinery
- Region:** APAC
- Problems:** large wastewater footprint
  - limits project expansion
  - long-term liabilities
- Piloting:** yes, initially small-scale
- Tech:** aMES™

### Indicative Findings

- Indicative flow sheet developed
- Volume reduction of >90% anticipated
- Recovery of target components from waste
- Indicative annual net benefit of ~\$100 million
- Indicative project payback, ~2 years

### Next Steps

- Perform concept study (proposal issued)

## Summary

- These are long-term problems, facing very large operations. Any viable solution, will take considerable time to evaluate, before commitment to ultimate solution.
- The “annual net benefit” described above is based on internal preliminary technoeconomic assessments (revenues + savings – costs), is indicative only, will change materially as subsequent evaluations are progressed and should not be relied upon for any purpose. These amounts do not reflect any form of guidance.

### Project B

- Owner:** major mining company
- Asset:** mine and refinery
- Region:** EU
- Problems:** large wastewater footprint
  - limits project operations
  - long-term liabilities
- Piloting:** yes, initially small-scale
- Tech:** aMES™

### Indicative Findings

- Indicative flow sheet developed
- Volume reduction of ~90% anticipated
- Recovery of target components from waste
- Indicative annual net benefit of \$35 million
- Indicative project payback, ~3.5 years

### Next Steps

- Perform concept study (proposal issued)

### Project C

- Owner:** major energy company
- Asset:** upstream production
- Region:** APAC
- Problems:** large wastewater footprint
  - limits project expansion
  - long-term liabilities
- Piloting:** yes, iBC™ only
- Tech:** iBC™ & aMES™

### Indicative Findings

- Indicative flow sheet developed
- Volume reduction of >90% anticipated
- Recovery of target components from waste
- Indicative annual net benefit of >\$5 million
- Indicative project payback, ~3 years

### Next Steps

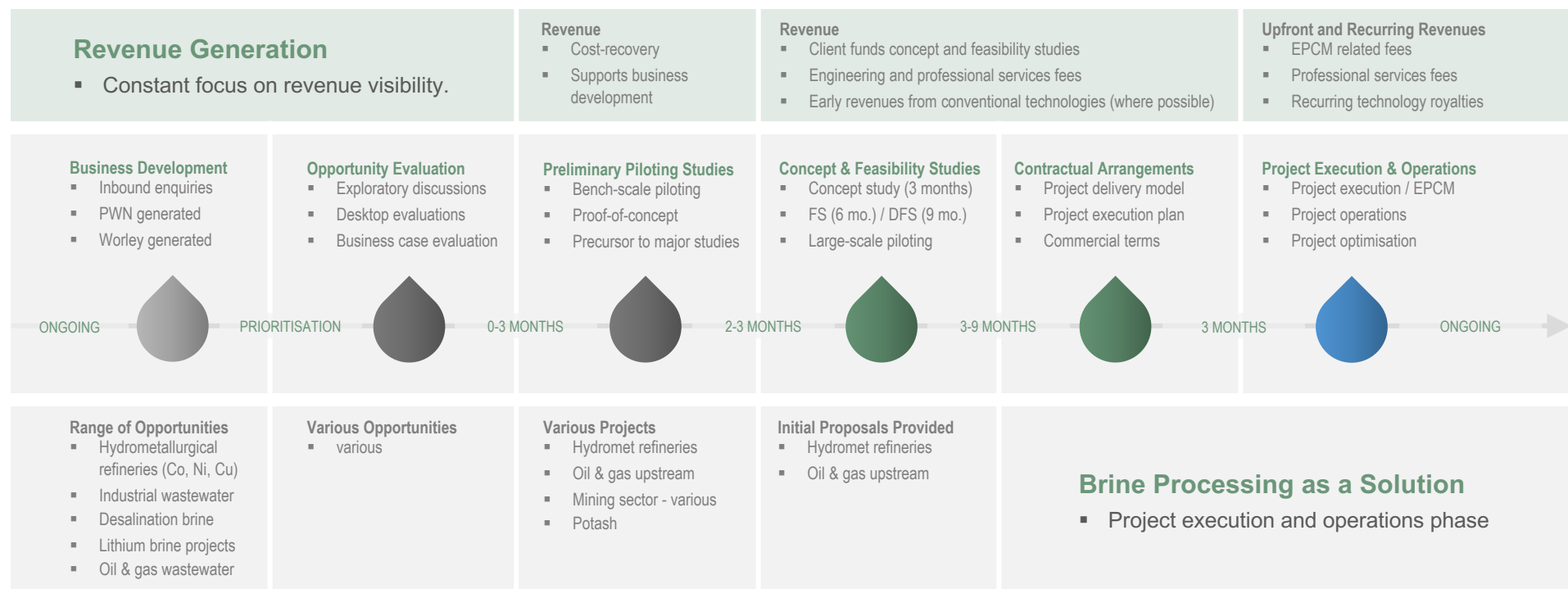
- Perform concept study (proposal preparation)



# Indicative Business Development Cycle

## Overview

- Given the nature of target projects (large, complex and long-life operations), the business development cycle is similarly sophisticated with many stakeholders.
- Currently advancing pipeline of projects through key business development stages, with a specific focus on high value applications.
- Indicative timelines associated with the business development cycle are outlined below. The trajectory of each project will vary depending on specific factors.



## Strategic Opportunities

- In parallel to new technologies, seek to opportunistically identify and capture opportunities for near-term revenue generation through conventional technologies.

# Investment Case

## BUILDING AN ATTRACTIVE BUSINESS

### 1) Unique Technology Portfolio

- Proprietary aMES™ technology platform – patented IP & knowhow
- Acquisition of patented iBC™ technology – undergoing optimisation studies
- Building **world-class brine processing technology portfolio**

### 2) Very Large Addressable Markets

- Global Mining, Energy, Desalination & Industrial waste brine streams
- All represent **multi-billion dollar opportunities** for the right technologies
- Strong economic, regulatory and ESG drivers supporting change

### 3) Focus on High Value Applications

- High margin opportunities where a mature low-cost alternative doesn't exist

### 4) Working with Leading Strategic Partners

- Partnering with **tier-1 EPC (engineering)** and OEM (equipment) partners

### 5) Highly Attractive Business Model

- **Capital-light business model** enables rapid roll-out and FCF generation
- **Recurring revenues** based on technology licensing related fees
- High barriers to entry enable **significant value capture** without ownership

### 6) Attracting Interest of Major Industry Players

- Performing pilot studies and in discussions with **prospective tier-1 clients**

## WATER TECHNOLOGIES TO ADDRESS ESG CHALLENGES



# BPaaS

Brine Processing as a Solution™

# Appendices

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- 28      **Appendix 1A** – Processing Brine with Proprietary Technology
- 29      **Appendix 1B** – Advantages of Brine Processing as a Solution
- 30      **Appendix 1C** – iBC Technology™ – The CSG Opportunity
- 31      **Appendix 1D** – Global Strategic Cooperation Agreement – Worley
- 32      **Appendix 1E** – Davenport Resources (ASX: DAV)

# Processing Brine with Proprietary Technology

## Processing Range of Brines and Salts

- Globally, more than **250,000,000m<sup>3</sup>** of **concentrated brine is produced daily**, more than half of the brine is produced by **desalination plants**.
- Large amounts of primary and waste brines are also produced from **mining** (potash, lithium), **energy** (oil, gas, power generation) and other major industries.
- Processing and disposal of these brines is often complex, problematic and expensive. Processing **costs can exceed \$10/m<sup>3</sup>**, providing an attractive opportunity.

## Brine Processing Technology Platform



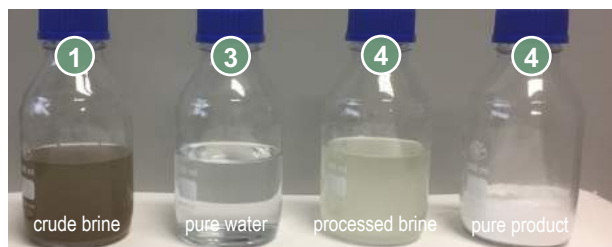
### BPaaS™ - Brine Processing as a Solution

As a brine processing technology company, Parkway Minerals is focused on recovering valuable minerals from complex brines, whilst reducing waste volumes.

### Our Goal

To be recognised as a **technology solution provider of choice**, in relation to addressing high concentration feedstock and wastewater related challenges, in the energy, mining and wastewater industries.

## Processing Range of Brines



### Simplified Brine Processing Process:

- 1) Take waste (crude) brine streams (feedstock).
- 2) Process the brine with proprietary brine processing technology including [aMES™](#) and/or [iBC™](#).
- 3) Recover very pure fresh water, thereby reducing waste volumes, and
- 4) Produce range of **high-purity minerals** including potash, lithium, nickel, cobalt, copper & other salts.

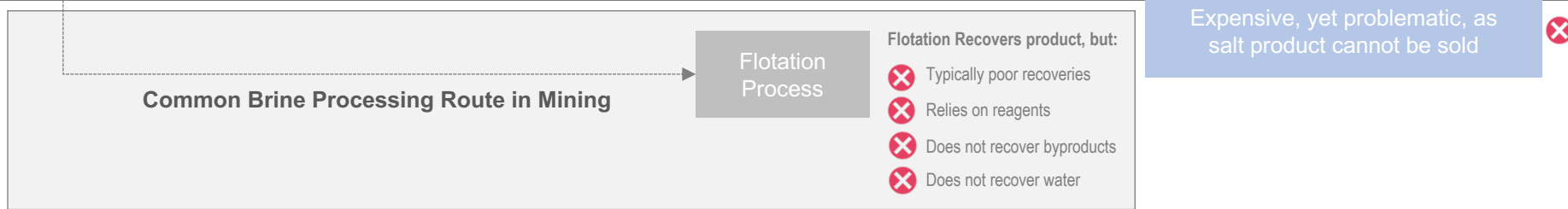
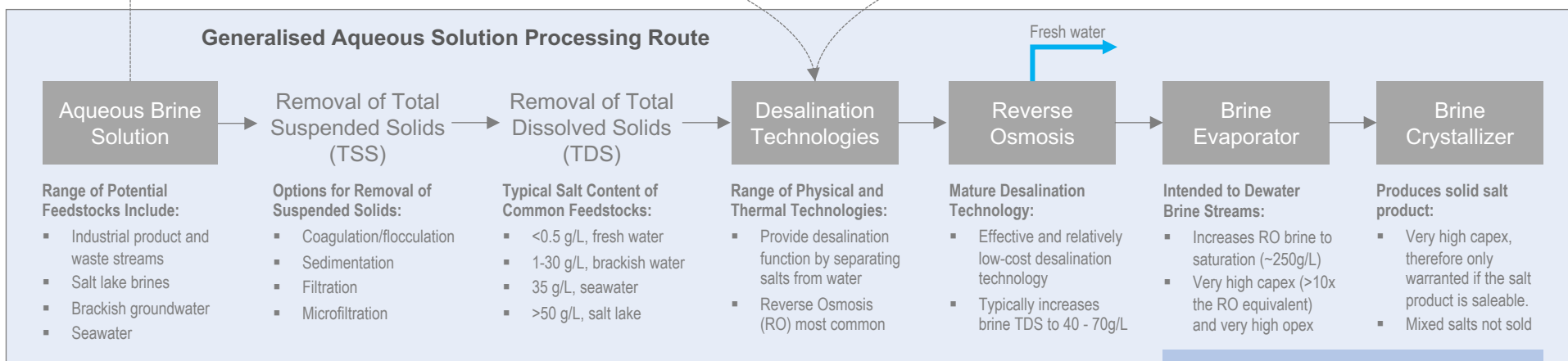
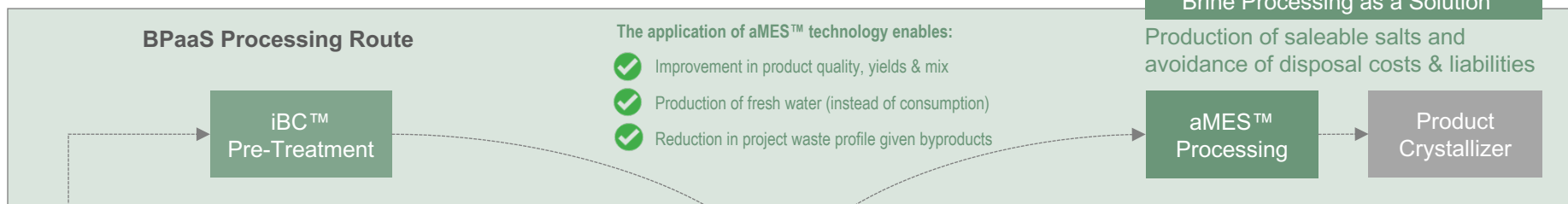
# Advantages of Brine Processing as a Solution

## In More Detail

- Conventional technologies for processing aqueous solutions are mature, and increasingly, **no longer fit-for-purpose**, particularly in terms of process performance (product recoveries, purity and environmental credentials).

**BPaaS**  
Brine Processing as a Solution™ ✔

Production of saleable salts and avoidance of disposal costs & liabilities

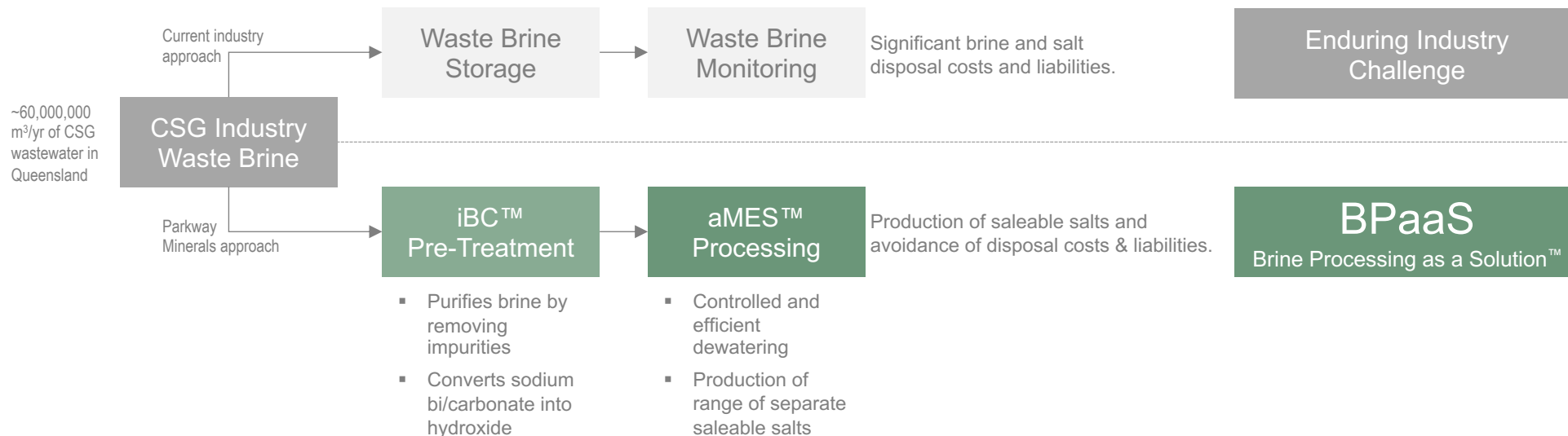


Expensive, yet problematic, as salt product cannot be sold ✘

# iBC Technology™ – The CSG Opportunity

## Overview

- Significant associated water is produced by the Coal Seam Gas (CSG) industry in Australia. It's estimated 60 GL of associated water containing almost 200,000 tonnes of salts is produced in Queensland, annually. With the recent news (April 2020), that Arrow Energy was proceeding with the development of a \$10 billion CSG project in the Surat Basin in Queensland, the scale of the problem in processing waste brines, is anticipated to increase further.
- On [15 May 2020](#), Parkway Minerals announced it had acquired the integrated Brine Causticization (iBC™) technology.
- The acquisition includes the process patent, associated knowhow and a pilot plant based on the iBC™ technology.
- The iBC™ technology purifies typical CSG industry brines and effectively integrates with the aMES™ technology, enabling the subsequent production of saleable products from these pre-treated waste brine streams, which would otherwise require storage and disposal.



## Next Steps

- Parkway has been approached by several CSG industry participants, including operators, to explore options, as conventional approaches are inadequate.
- As part of the acquisition of the iBC™ technology, a pilot plant has been relocated to Victoria University, where a **technology optimisation and integration program is underway** to support ongoing business development activities in the CSG industry and assist in the commercialisation of the technology.



# Global Strategic Cooperation Agreement – Worley

## Overview

- Alignment with an experienced **global engineering company** has been a key priority for building the next stage of the aMES™ Technology Platform.
- On [8 May 2020](#), Parkway Minerals entered into a Global Strategic Cooperation Agreement to enable provision of engineering, procurement and construction (EPC) support to contracts executed under the agreement.
- The Global Strategic Cooperation Agreement provides Parkway Minerals with **EPC support, underpinning ongoing efforts to commercialise the aMES™ technology platform.**
- The agreement incorporates an innovative revenue sharing model and mutual exclusivities, ensuring **strong alignment between both parties.**

## Key Terms of Agreement

- The other party to the agreement is with a subsidiary of the **Worley Group.**
- **Joint Projects** – The parties will nominate joint projects envisaging use of the aMES™ technology (including projects the parties are already involved with) to each other, and once declared a joint project, will pursue such project exclusively with each other.
- **Exclusivities** – In addition to joint projects, the parties have agreed to certain exclusivities, non-compete and first right of refusal arrangements.
- **Revenue Sharing Model** – The parties have agreed to an innovative revenue sharing model, where Parkway Minerals retains all preliminary evaluation and upfront licensing fees, with recurring licensing fees, and other revenues/margins, shared by the parties on a predetermined formula.
- **Intellectual Property** – All intellectual property relating to the aMES™ technology platform, including any improvements, will remain the exclusive property of Parkway Minerals.
- **Term** – Initial term of 3 years.

## aMES™ Project Opportunities

### Parkway Minerals Project Portfolio

- Parkway Minerals has identified several potential aMES™ opportunities in its existing business development portfolio, that are likely to be assessed for suitability under this agreement.
- Parkway Minerals intends to put forward several advanced-stage third-party projects for evaluation. Several of these projects have undergone substantial process evaluation (including **successful aMES™ based piloting**) and are operated by **globally significant mining companies.**
- On [11 May 2020](#), Parkway Minerals announced it had commenced the Karinga Lakes Potash Project – Pre-Feasibility Study (KLPP-PFS). The **KLPP-PFS** is being delivered under the Global Strategic Cooperation Agreement (Worley acting as study manager) and is intended to form the basis for **joint capability development.**

### Worley Project Portfolio

- Significant depth of opportunities within Worley's global network, with several potential aMES™ opportunities identified.

### Global Opportunities

- Given the significant scale of addressable markets for the aMES™ technology, particularly in the energy and mining sectors, the parties have identified potential opportunities to deploy core capabilities.

## Additional Details

- The parties are evaluating various options for **joint marketing** including a Capability Statement, to provide further details about the collaboration and efforts in advancing the aMES™ technology platform.

# Strategic Investment - Davenport Resources

## Overview

- Davenport Resources (ASX: DAV) is a pure-play potash company with a globally significant potash resource inventory, in the established potash mining district of South Harz, in Central Germany.

## Recent Transformational Capital Raising

- On 26 November 2020, Davenport Resources announced a successful \$10 million capital raising, to enable the company achieve major milestones, including verification drilling of the existing mineral resource.

## Parkway Minerals Shareholding

Parkway Minerals is one of the largest shareholders in Davenport Resources, with a strategic shareholding of:

- 34.27 million shares (~17.4% issued capital, before above capital raising), and
- 7.14 million options (DAVO)
- Value of shareholding **\$1.85 million** (based on recent price of \$0.052/share)
- In time, as key milestones are achieved, Parkway Minerals expect to realise substantial value from strategic shareholding in Davenport Resources.

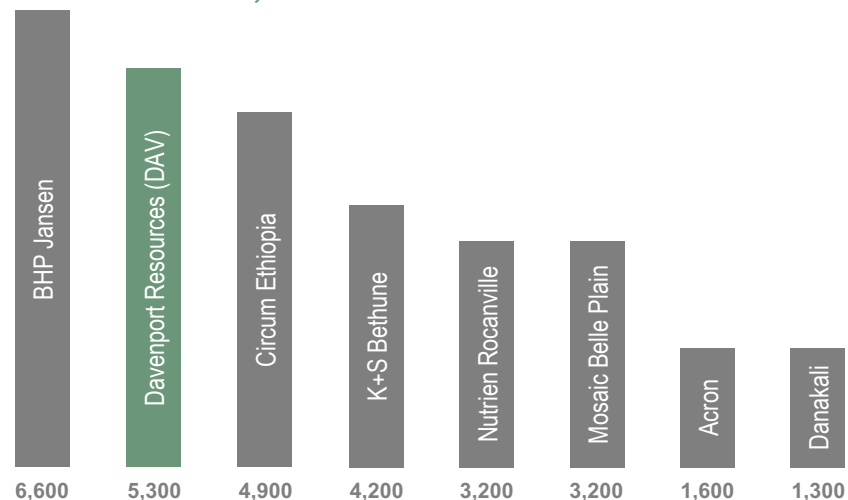
## Corporate Opportunities

- Parkway Minerals has previously performed testwork to demonstrate the suitability of the aMES™ technology to process primary and waste brine streams from similar potash projects.
- Major catalysts for Davenport Resources include upcoming drilling, feasibility studies and/or unlocking value in a corporate transaction, which may involve:
  - Introduction of JV partner/s and/or strategic investors, or
  - Sale of non-core project to raise funds for core projects, or
  - Dual-listing of the company on a major European exchange.

## Major Potash Inventory

- Davenport controls over 5.27 Billion tonnes (average grading 10.8% K<sub>2</sub>O) of JORC Inferred Resource from its portfolio of mining and exploration licences, including significant sylvinitic and carnallitic resources.
- In addition to being the largest known potash resource in Western Europe, Davenport Resources holds the world's second-largest untapped resource.

## Total resources, million tonnes



Source: Adapted from Davenport Resources Corporate Presentation, ASX Release, 27 November 2020.

## Resource Profile

- The Davenport Resources mineral resource, extends over 4 separate standalone project areas, targeting low capital and operating costs.
- Unique resource also contains sulphates, enabling attractively priced magnesium and potassium sulphate products to be produced.