Multiple existing water solutions identified for green hydrogen production eliminating a major capital cost

Frontier Energy Limited (ASX: FHE) (**Frontier** or the **Company**) is pleased to announce preliminary results from the Green Hydrogen Study have identified numerous existing water sources suitable for green hydrogen production near the Company's Bristol Springs Solar Project (the **BSS Project**).

Accessing an existing water solution means the development of a desalination plant is not required. This significantly reduces both the capital and operating costs as well as the development timeline.

HIGHLIGHTS

- **As part of the Green Hydrogen Study, preliminary results have identified multiple existing solutions for water sources suitable for use in the Southwest of Western Australia**
  - Without access to existing water sources, a desalination plant would be required, adding significant capital and operating costs
- **Water is an essential element for green hydrogen production through electrolysis, with 9 litres of suitable water (H_20) required for every kilogram of hydrogen (H_2) produced**
- **Existing water solutions identified surrounding the Project with both suitable water and sufficient capacity include the following:**
  - Bunbury Wastewater Treatment plant
  - Yarragadee freshwater aquifer; and
  - Accessing water from existing desalination facilities in Kwinana or Bunningup.
- **The Company is in discussions with key stakeholders from each of the above water sources regarding access for future green hydrogen production**
- **The Company remains on track to release both the Renewable Expansion and Green Hydrogen Study by mid-2022**

Managing Director Mike Young commented, *the importance of accessing suitable water for green hydrogen production is a critical aspect many appear to be overlooking regarding the development of a sustainable green hydrogen industry.*

Without access to a suitable existing water solution developing a desalination plant is required. Whilst this technology is well understood, it can add hundreds of millions of dollars to a project's initial capital cost (depending on its size) as well as increase the operating costs. The development of a desalination plant will also slow a project's development timeline given the stringent environmental and development conditions to be met.

The location of our Bristol Springs Project has again given Frontier a major advantage to others with multiple options throughout the region for existing water access. Being on the SWIS allows the Company to transfer our green electron's to the most suitably located hydrogen facility.

However, clearly being able to use treated wastewater is an excellent outcome for all stakeholders as this adds yet another element of ***GREEN*** *to the project".*

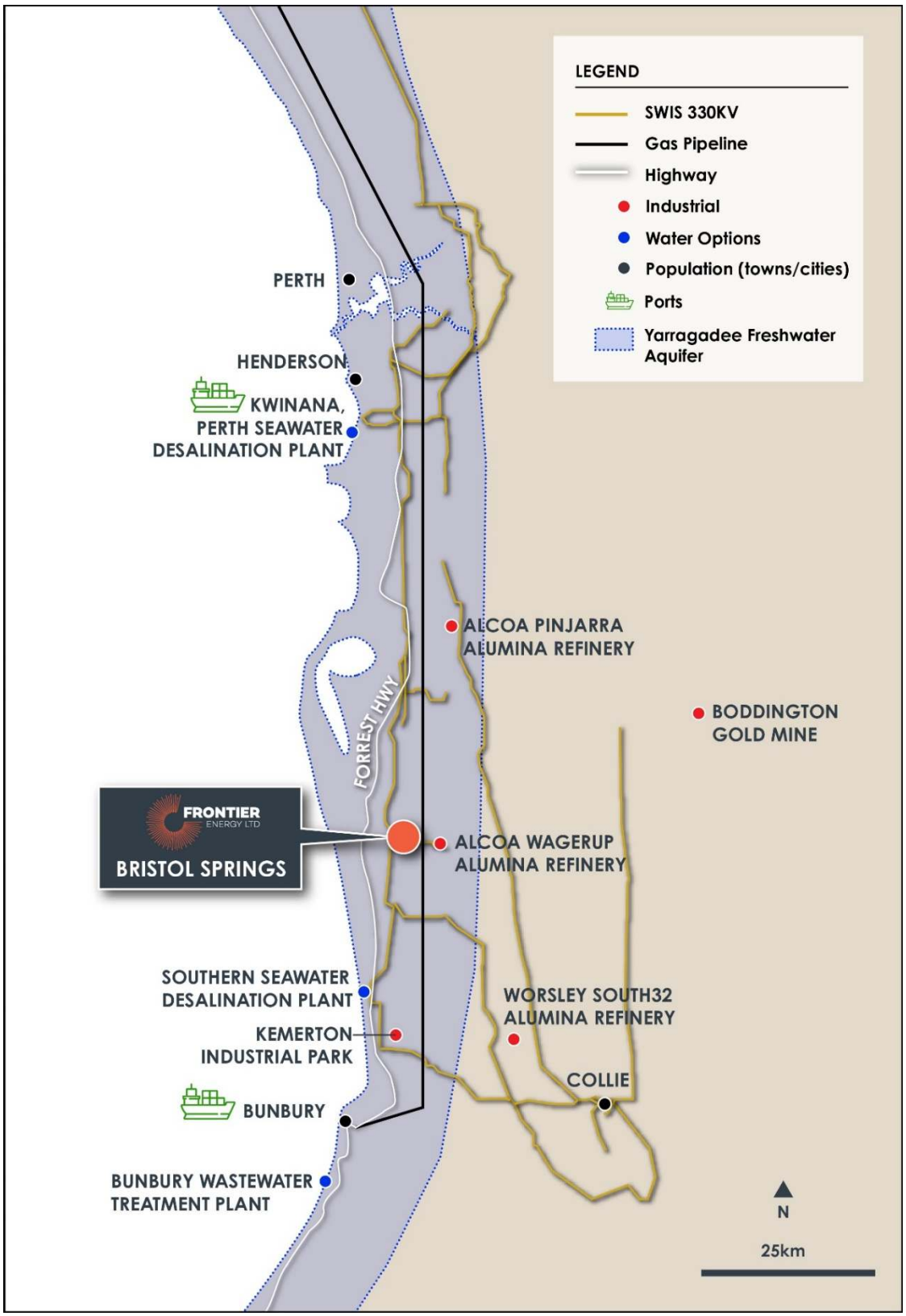


Image 1 – Location of critical elements for green hydrogen production in SW-WA

Multiple existing water solutions identified throughout Southwest WA for future green hydrogen production

As part of the Company's long-term strategy to become vertically integrated across the green hydrogen industry, the Company engaged leading global energy consultancy Xodus Group, to complete a Green Hydrogen Study (the "Study") (ASX Announcement 15 March 2022).

One of the key elements for green hydrogen production is access to purified water. Xodus performed a water related technology assessment across water import, treatment and disposal.

Given the Study assumes power will be sourced from the BSS Project and it is connected to the Southwest Interconnected System (SWIS), the electricity grid covering the southwest of Western Australia, there is the potential for the green electrons to be transferred anywhere across the region. This provides greater flexibility regarding a location for a future hydrogen facility.

Given this and the forecast water consumption of approximately 0.2GL, for the initial facility being considered, the following existing solutions were considered as offering both suitable water as well as sufficient capacity.

- Yarragadee freshwater aquifer
- Bunbury Wastewater Treatment plant
- Existing desalination in Kwinana and Bunningup

Bunbury Wastewater Treatment Plant

The Bunbury Wastewater Treatment plant ("BWWT") is located approximately 7 km south of Bunbury and currently treats an average volumetric flow of 13,000kL/day wastewater using the trickling filter system.

Xodus identified the potential to use the treated wastewater from the BWWT as feedstock and to further alleviate high pipeline costs due to extensive piping requirements. It is recommended that the hydrogen production facility physically extract the water from the nearby Yarragadee freshwater aquifer. This strategy entails a virtual pipeline model whereby the hydrogen electrolyser water usage can be offset by adopting ground water replenishment technology.

This will entail injecting drinking-water-quality treated wastewater into the Yarragadee aquifer at a location proximate to the BWWT and extracting freshwater from the aquifer at the hydrogen production plant location.

Australia's first full-scale Groundwater Replenishment Scheme is located in Perth's northern suburbs, Western Australia. It started recharging recycled water to Perth's deep aquifers in 2017.

At capacity, the Advanced Water Recycling Plant recharges the Leederville and Yarragadee Aquifers onsite, with the remaining volume of water being transferred to recharge bores drilled in Wanneroo and Neerabup.

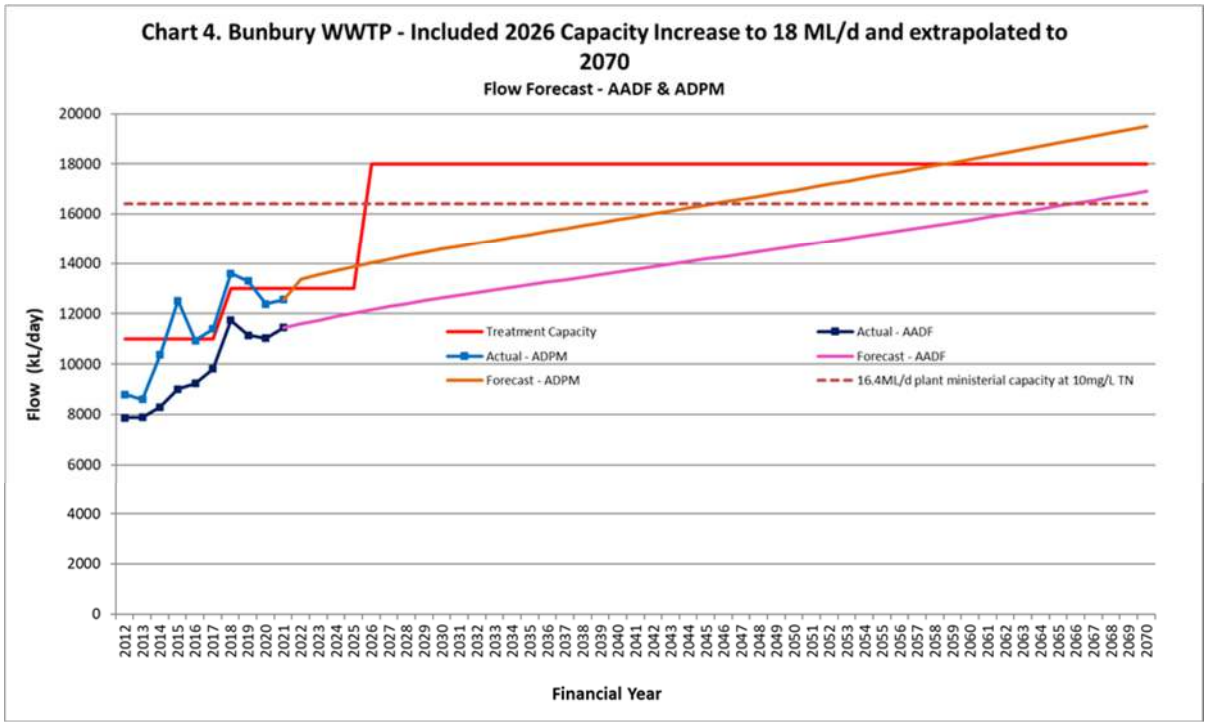


Image 2: Historical and Forecast treated water capacity

From the graph above, it is estimated that an average volumetric flow of 5.11 GL/year treated wastewater is disposed into the ocean via an ocean-outfall pipeline.

Phase 1 of Frontier's hydrogen plant utilises 150MW electrolyser and requires a volumetric flow 0.2GL/year for feedstock and process water. Phase 2 is potentially to scale the electrolyser to 500MW which will require a volumetric flow of 0.5 GL/year. Phase 3 is potentially to scale the electrolyser capacity up to 1000MW, requiring an average volumetric flow of 1 GL/yr.

The treated wastewater has a pH level of 8 at a temperature range of 16℃ to 24℃ and meets the electrolyser specification of 6.5>pH<9 for a temperature range of 7℃ to 32℃. Other key metrics including Alkalinity are within treatable ranges thus indicating that the treated wastewater is suitable for the intended purpose of electrolysis.

Why is water essential for green hydrogen?

Hydrogen gas ('hydrogen') is a versatile energy carrier and feedstock, derived primarily by splitting water using electricity or by reacting fossil fuels such as natural gas with steam or controlled amounts of oxygen. Hydrogen is carbon free and when burned, produces just heat and water vapour.

Hydrogen can be produced from water in multiple ways. One way is through a process known as electrolysis, which extracts hydrogen from water using electricity. When renewable

electricity is used, this process produces no carbon emissions. We can call this clean 'renewable hydrogen'.

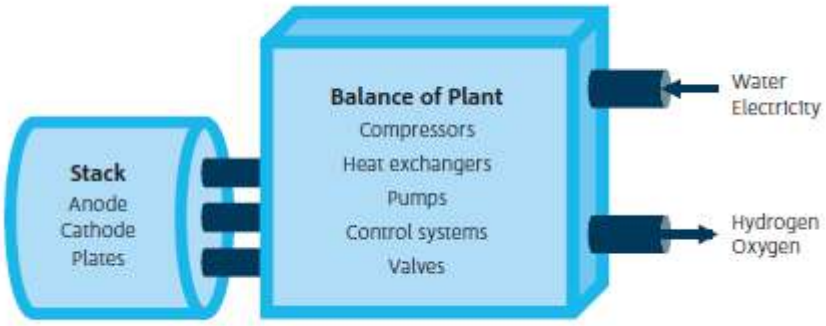


Image 3: Green hydrogen flowsheet

What is desalination?

Desalination is a process that extracts salt and other minerals from seawater to produce freshwater. The technology is used widely throughout Australia in all main capital cities (Perth, Sydney, Melbourne, Adelaide, and Brisbane).

The process works moving seawater through a filter to remove large particles through a process called reverse osmosis. Under extremely high pressure, the seawater goes into semi-permeable membrane used to purify the water taking salt and impurities out.

Reverse osmosis involves high capital costs including for construction and further maintenance. The desalination facility in Kwinana was constructed in November 2006 with a total project cost of $387m.

In addition, compared to traditional water treatment, desalination is highly energy-intensive. The energy consumption for reverse osmosis is around 1-kilowatt-hours per 400 litres[1][2].

Source: 1 - https://energycentral.com/c/ec/desalination-and-energy-consumption
2 - https://blogs.unimelb.edu.au/sciencecommunication/2019/09/30/better-than-running-out-of-water-desalination-plants-in-australia/

Authorised for release by Frontier Energy's Board of Directors.

ENDS

To learn more about the Company, please visit www.frontierhe.com, or contact:

Mike Young
Managing Director
+61 8 9200 3428
myoung@frontierhe.com

Adam Kiley
Corporate Development
+61 8 9200 3428
akiley@frontierhe.com

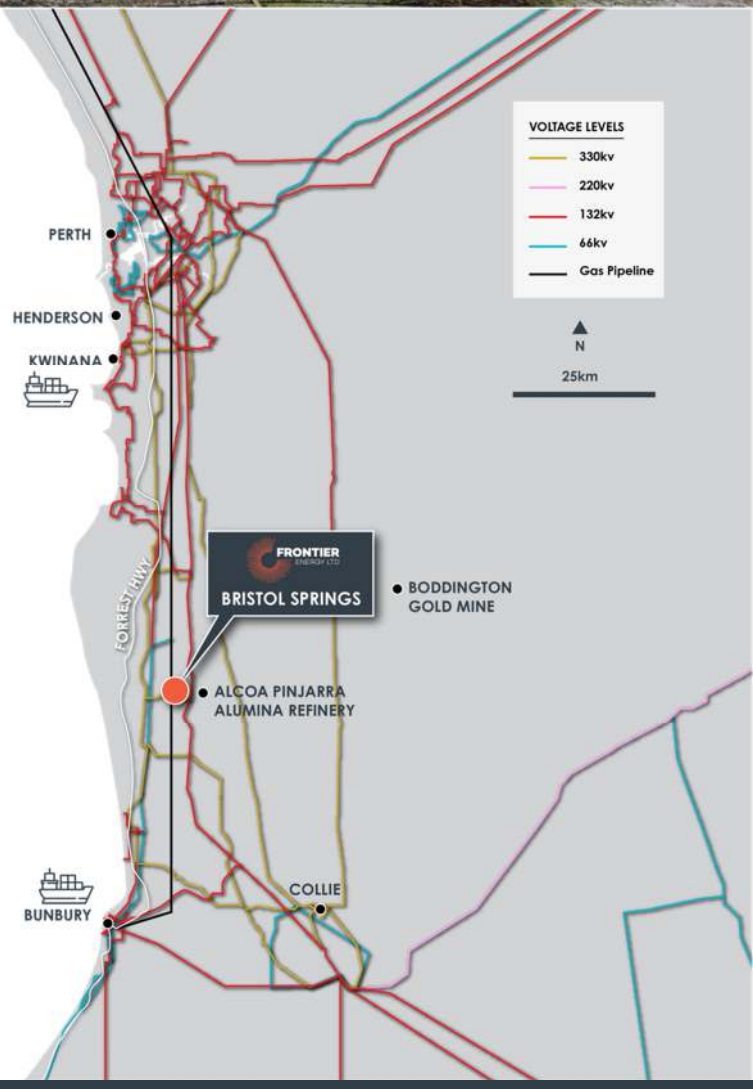
FRONTIER ENERGY LTD

About Frontier Energy

Frontier Energy Ltd (ASX: FHE) is a clean energy company developing the Bristol Springs Solar Project (BSS Project) near Waroona in Western Australia.

The BSS Project will provide enough power for 45,000 homes and abate 180,000t of CO_2 emissions per year.

The Project is located 120 km south of Perth, and importantly is within the "Golden Triangle" of Kwinana-Bunbury-Collie, which provides both supporting infrastructure and potential offtake customers.



Directors and Management

Mr Grant Davey
Non-Executive Chairman

Mr Mike Young
Managing Director

Mr Chris Bath
Executive Director

Ms Dixie Marshall
Non-Executive Director

Registered Office

Level 20, 140 St Georges Terrace
Perth WA 6000

Share Registry

Automic Registry Services
Level 5, 126 Philip Street
Sydney NSW 2000

For a comprehensive view of information that has been lodged on the ASX online lodgement system and the Company website, please visit asx.com.au and frontierhe.com, respectively.