FRONTIER ENERGY LTD

Definitive Feasibility Study confirms Bristol Springs as one of Australia's lowest cost, near-term green hydrogen producers

Frontier Energy Limited (ASX: FHE; OTCQB: FRHYF) (**Frontier** or the **Company**) is pleased to announce the completion of the Definitive Feasibility Study for Stage One (**DFS** or **Study**) of the Company's Bristol Springs Renewable Energy Project (the **Project**), located 120km from Perth.

The DFS reaffirmed the potential for the Project to be a leader in the Australian green (low carbon) hydrogen industry, benefiting significantly from proximity to existing infrastructure that drives annual production of green hydrogen to 4.9Mkg pa (Pre-Feasibility Study (**PFS**) 4.4Mkg pa) at a total cost of A$2.77/kg (inclusive of capital costs), which is one of the lowest reported costs[1] for a green hydrogen project of this scale in Australia.

The Company continues to advance offtake and funding discussions prior to a final investment decision (**FID**) that is currently anticipated for later this year.

HIGHLIGHTS

- **A DFS assessing Stage One green hydrogen production at the Project confirmed its potential to be a low-cost, early mover in the development of Australia's green hydrogen industry**
- **Total initial capital cost for Stage One is estimated at $242.5 million (PFS $236.2m), inclusive of the 114MW solar farm and the 36MW alkaline electrolyser**
- **Forecast production increased to 4.9m kilograms per annum (Mkg pa) (PFS 4.4Mkg pa) due to increasing the load factor of the electrolyser to 84% (PFS 75%).**
  - *The increased load factor is due to increased utilisation of the grid connection in off-peak electricity conditions*
- **Total unit cost[2] (inclusive of capital) of $2.77 per kg of hydrogen produced (PFS $2.83 per kg). The low cost is driven by two major factors:**
  - *Low capital costs due to the Projects ability to access surrounding existing infrastructure; and*
  - *The Projects ability to utilise existing mechanisms for solar revenue (classified as a negative expense in the Study) that can only be accessed through the Project's connection to the South West Interconnected System (SWIS)*
- **The DFS relates to Stage One only. The Company's long-term plan to produce at least 1GW of renewable energy in the Waroona region. This energy would be sufficient to produce approximately 80 Mkg pa of green hydrogen**
- **Frontier is in the advanced stages of a process to secure a foundation offtake customer to commercialise Stage One. Following this major milestone, the Company anticipates commencing project financing to enable a Final Investment Decision.**

[1] *https://www.infolink-group.com/energy-article/green-hydrogen-costs-in-australia-to-reduce-37-by-2030*
[2] *Total unit costs = (total operating costs direct (annual) / annual production) + (total initial capital + total sustaining capital /life of operation production)*

Managing Director Sam Lee Mohan commented: *"We are delighted with the outcome of the Study as it again highlighted the unique opportunity we have at Bristol Springs to be a first mover in the green hydrogen industry."*

"The infrastructure surrounding the Project not only allows for our forecast costs to be some of the lowest in Australia for green hydrogen production, but also provides an opportunity for early production as the industry continues to mature over time."

"We believe the most likely pathways to early production will come from hard to abate sectors through accessing the nearby Dampier to Bunbury Natural Gas Pipeline, which can already take up to 9% hydrogen, as well as the potential for the development of a peaking plant, which uses hydrogen for flexible energy generation to meet high demand periods on the WA electricity grid."

"Both of these potential early pathways to production are in line with the Western Australian Government's strategy and targets for the production and consumption of green hydrogen within the State."

Figure 1: Impression of the Stage One solar farm at the Bristol Springs Project

Cautionary Statement

The DFS has been carried out to assess the feasibility of green (low carbon) hydrogen production in Stage One of the Project. The DFS builds on the design, engineering and economic assessments on which the PFS was based. The work done in the DFS has provided engineering studies and estimates for costs and rates of return that support the technical and financial viability of Stage One of the Project thus enabling the Company to move to the next phase of assurance of an economic development case.

To achieve the potential project development outcomes indicated in the Study, additional funding will be required. Investors should note that there is no certainty that the Company will be able to raise funding when needed. It is also possible that such funding may only be available on terms that are dilutive or otherwise affect the value of the Company's existing shares.

The Company will need to secure customer offtake for Stage One hydrogen production to support its funding requirements. The market for commercial hydrogen production is embryonic and its development affected by a range of matters including government regulation and policy in Australia and globally and changes in the energy markets. There is no certainty that the Company can secure offtake commitments on terms acceptable to it in the timeframe envisaged in the DFS.

The Company has concluded that based on the results of the Study and strong market fundamentals there is a sufficient degree of confidence to progress the Project further. However, given the uncertainties involved, investors should not make any investment decisions based solely on the results of this Study.

Forward-Looking Statements

This release contains 'forward-looking statements' that are based on the Company's expectations, estimates and projections as at the date of the statements. All statements, trend analysis and other information contained in this announcement relative to markets for the Company, trends in energy markets, production quantities and anticipated expense levels, as well as other statements about anticipated future events or results constitute forward-looking statements. Forward-looking statements are often, but not always, identified by the use of words such as "seek", "anticipate", "believe", "plan", "estimate", "expect" and "intend" and statements that an event or result "may", "will", "should", "could" or "might" occur or be achieved and other similar expressions.

Forward-looking statements and information are subject to known and unknown risks, uncertainties and other factors that could cause actual results to differ materially from those contained in the forward-looking statements. This includes factors such as: general business, economic, competitive, political and social uncertainties; outcome of further economic valuations; regulatory and political changes on energy production and consumption, decarbonisation and climate change related matters both at federal and state level; the cost to procure and build plant and equipment including the impact of inflation and the availability of contractors to do; supply chain disruption, delay and cost increases; delays in government approvals or other government steps needed to support green hydrogen projects; the ability of the Company to secure financing and the cost and terms of such financing; the nascent state of the hydrogen market and the ability of the Company to secure offtake commitments and the price achievable.

Forward-looking statements are based on estimates and opinions of management at the date the statements are made. The Company does not undertake any obligation to update forward-looking statements even if circumstances or management's estimates or opinions should change. Investors should not place undue reliance on forward-looking statements.

Executive Summary

The Project is located in the South West region of Western Australia, approximately 120km from Perth and 8km from the town of Waroona. The Company engaged global engineering firm, GHD, to complete engineering and cost studies to provide a Class 3 CAPEX and OPEX estimate (10% - 15% accuracy) to assess the case for hydrogen production based on a 36 MW electrolyser. Incite Energy investigated maximum energy yield and costs for the 114MW solar plant. These pieces of work form the basis of the Study. The key inputs and outputs from the Study are highlighted in Table 1 below.

Stats	Unit	DFS	PFS	Change
Life of operation	Years	25	25	-
Solar				
Energy Production (post degradation and availability) (Yr 1)	GWh	245	245	-
Annual Degradation	%	0.3	0.3	-
Availability	%	98	98	-
Solar Capacity	MWdc	114	114	-
Reserve Capacity Allocation	MW	24.5	24.5	-
Hydrogen				
Electrolyser – nameplate capacity	MW	36	36	-
Energy required to produce 1kg Hydrogen (End of Life)	KWh	55	55	-
Water consumption	L / hr	27,500	55,000	27,500
Hydrogen production (pa)	M kg	4.9	4.4	0.5
Excess energy sold (pa)	MWh	112,000	113,000	(1,000)
Average target load factor (max.)	%	91	91	-
Applied load factor	%	84	75	9
Costs – Operating				
Operating costs – Solar	A$ m pa	$3.2	$3.2	-
Operating costs – Hydrogen	A$ m pa	$3.5	$3.5	-
Operating costs (Power sales/purchases)[1]	A$ m pa	($3.3)	($4.5)	$1.2
Power Purchases Average Price - $68/MWh	*A$ m pa*	*$9.5*	*$7.7*	*($1.8)*
Excess Power Sales Average Price - $30/MWh	*A$ m pa*	*($3.3)*	*($4.5)*	*($1.2)*
Large Generating Certificates (LGCs) *Average Price - $45*	*A$ m pa*	*($4.7)*	*($4.7)*	-
Capacity Credit *Average Price - $193,000*	*A$ m pa*	*($4.8)*	*($3.0)*	*$1.8*
Total Operating Costs (Direct)[2]	**A$ m pa**	**$3.4**	**$2.2**	**$1.2**
Capital				
Stage 1 – Solar	A$ m	$157.9	$166.3	$8.4
Stage 1 – Hydrogen	A$ m	$84.6	$69.9	($14.7)
Total Initial Capital	**A$ m**	**$242.5**	**$236.2**	**($6.3)**
Sustaining Costs[3]	A$ m	$11.7	$11.7	-
Total Capital Costs	**A$ m**	**$254.2**	**$248.5**	**($6.3)**

Table 1: Key Production and Costing Assumptions

1 – Operating costs (power sales/purchases) = Power purchased from the grid (during off peak) – Excess power sales (on the grid) – Capacity Credits – Large Generation Certificates). All assumptions regarding each [sub cost] are outlined in the Study
2 – Excludes financing, depreciation and corporate costs
3 – Replacement Stack required after 90,000 hours. Replacement of solar panels are inclusive within Operating Costs - Solar

The Study forecasts annual green hydrogen production of approximately 4.9 Mkg pa. This is an increase of 11% compared to the PFS (4.4Mkg pa). The increase in production is a result of a higher efficiency/load factor for the electrolyser, which has increased from 75 % (PFS) to 84% (DFS).

The higher load factor is driven by increasing the amount of energy acquired from the grid during off-peak periods (ie: 9pm – 6am). This higher load factor assumption is still below the maximum load factor for the electrolyser of 91% stated in the Pre-FEED Study.

Based on revised assumptions and key inputs the Study results in a total production cost[3] of approximately $2.77 per kilogram of hydrogen. The breakdown of the key inputs is illustrated in Table 2 below.

Hydrogen Production	**4.9M kg pa**		
Costs – Direct Operating	**Unit**	**Cost pa (A$ m)**	**Unit cost $/kg**
Operating costs – Solar		3.2	0.65
Operating costs – Hydrogen		3.5	0.71
Power Purchases from the grid Average Price - $68/MWh		9.5	1.94
Total Operating Costs (Direct)	**$/kg**		**3.31**
Capital			
Total Capital Costs $254.2 over a 25 yr life of operation		10.1	2.08
Total cost per kg of Hydrogen produced before additional solar revenues	**$/kg**		**5.38**
Less By Product (solar) Revenues			
Excess Power Sales on the grid Average Price - $30/MWh		(3.3)	(0.67)
LGCs Average Price - $45		(4.7)	(0.96)
Capacity Credit Av. Price - $193,000		(4.8)	(0.98)
Total By-Product Revenue	**$/kg**		**(2.61)**
Total cost per kg of Hydrogen produced	**$/kg**		**2.77**

Table 2: Unit costs breakdown

The highlight of the Study is the low cost of hydrogen production. This low cost is due to two major factors. The first is the low initial capital cost due to surrounding existing infrastructure. This includes access to existing water pipeline, connection to the South West Interconnected System (SWIS) at the Landwehr Terminal as well as local skilled existing work force (meaning no camp and other related infrastructure). More remotely located projects are highly unlikely to have these benefits, therefore would have significantly increased capital costs.

[3] Total unit costs = (Total Operating Costs Direct (Annual) / Annual Production) + (Total Initial Capital + Total Sustaining Capital /Life of operation production)

The second driver for low costs is the Project's ability to utilise existing mechanisms that can be enabled by the connection to the SWIS at the Landwehr Terminal. This provides additional solar related income (classified in the Study as a negative cost). This includes unused daytime solar energy sales, Reserve Capacity Credits and the sale of excess LGC credits.

There is limited publicly available information regarding other green hydrogen projects in Australia due to the infancy of the sector as well as the majority of other projects being privately owned. ARENA[4] and other third-party reports have identified potentially significantly higher costs[5].

Next Steps

Frontier's main priority moving forward is to secure offtake with a foundation customer for the Project. The Company is in the advanced stages of a process for engaging with a number of parties to achieve this.

Following securing offtake, the Company will commence project financing discussions and negotiations. The transition to clean energy is expected to continue to accelerate and numerous banks and other financial institutions are playing a leading role in financing greenfield construction of renewable energy projects.

The Company has had a number of discussions with a range of Australian and International banks who are seeking renewable energy projects to finance. The Clean Energy Finance Corporation is also playing an active role in project financing to help deliver on Australia's ambitions for a thriving, low emissions future.

There are also various grants and credits available at both a State and Federal level which can be accessed to support funding the development of the Project.

The Australian Federal Government recently announced it will review its National Hydrogen Strategy to ensure Australia remains on a path to be a global hydrogen leader by 2030 on both an export basis and for the decarbonization of Australian industries. This review is in direct response to the USA's US$437 billion Inflation Reduction Act that will provide a tax credit of up to US$3 per kg of hydrogen for qualifying clean energy projects located in the USA. Similar incentives in other regions, including the EU, are also being progressed to support renewable energy project developments in those jurisdictions.

In addition to the Stage One development, the Company continues to assess expansion opportunities, as well as long-term downstream business opportunities.

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[4] *https://arena.gov.au/blog/how-could-renewable-hydrogen-power-our-lives/*

[5] *https://www.infolink-group.com/energy-article/green-hydrogen-costs-in-australia-to-reduce-37-by-2030*

Contents

1. Bristol Springs Renewable Energy Project - Location

The Bristol Spring Renewable Energy Project is located 120km south of Perth in the Shire of Waroona, in Western Australia. The closest town to the Project is Waroona, 8km away (4,700 population) and Collie is located about 50km away (9,000 population). The nearest city is Bunbury, which is 60km away (50,000 population), which also has a major port facility.

The Project is surrounded by major infrastructure critical for the production and dispatch of green hydrogen and renewable electricity. Figure 2 below illustrates the location of the Project in a regional context, relative to energy infrastructure, water networks, population centres, regional ports, strategic industrial areas and existing large mineral processing projects.

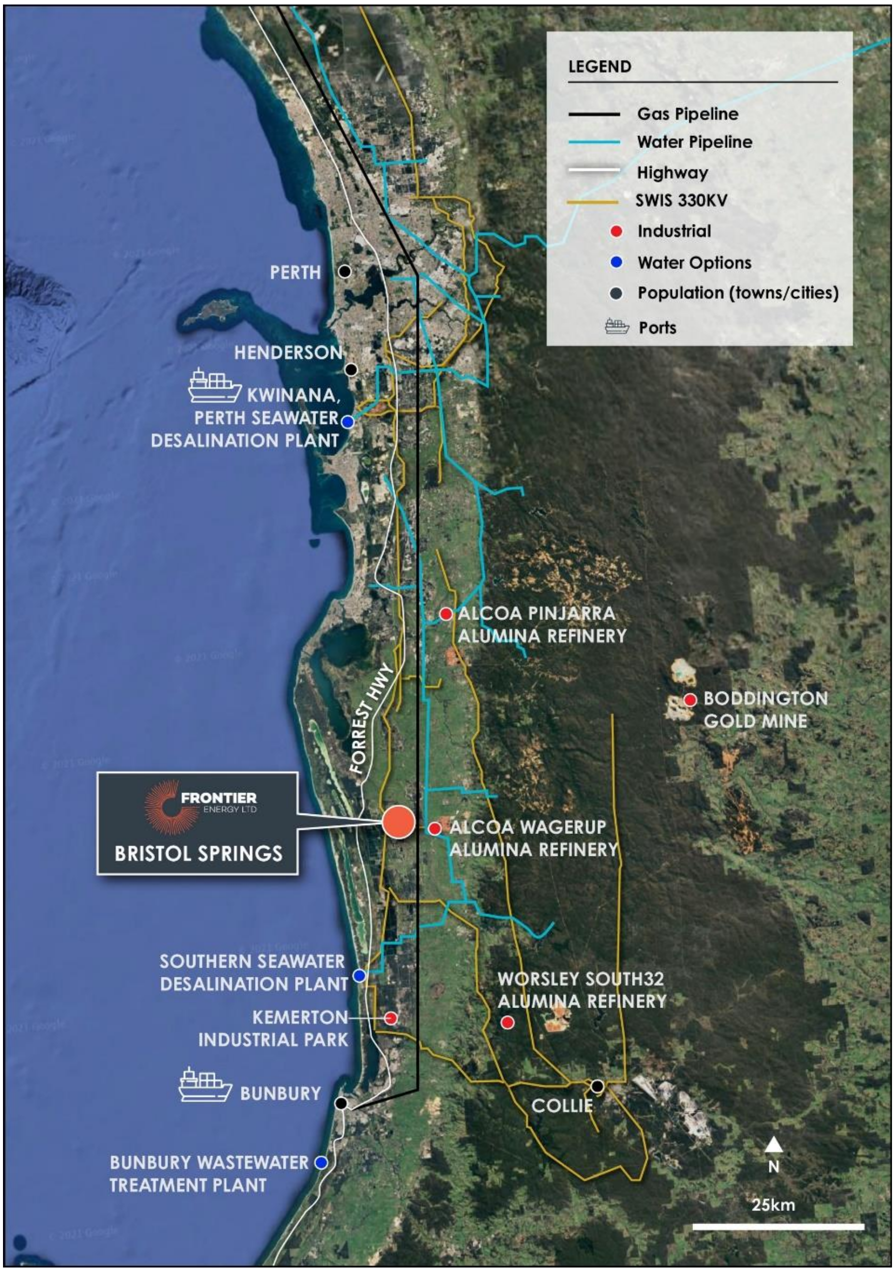

Figure 2: Location of the Bristol Springs Project

2. Solar Farm

The Project site is undeveloped and is predominantly cleared of vegetation from its historical use for intensive agricultural purposes.

The total landholding under control in the area, through both direct ownership and option agreements as well as the collaboration agreement with Waroona Energy Pty Ltd (ASX announcement – 6th October 2022) is 868ha. This land area is sufficient for major expansion in the future.

Figure 3: Aerial view of the Project Site

The Project will be connected to the existing Western Power 330kV transmission network via Landwehr Terminal which is located approximately 4km north-east of the Project. The Project has adopted a modular, plug and play approach to the design. This enables the Project to have a large portion of the solar materials factory tested prior to installation on site. Figure 4 below highlights the location of the Stage One solar farm as well as Landwehr Terminal.

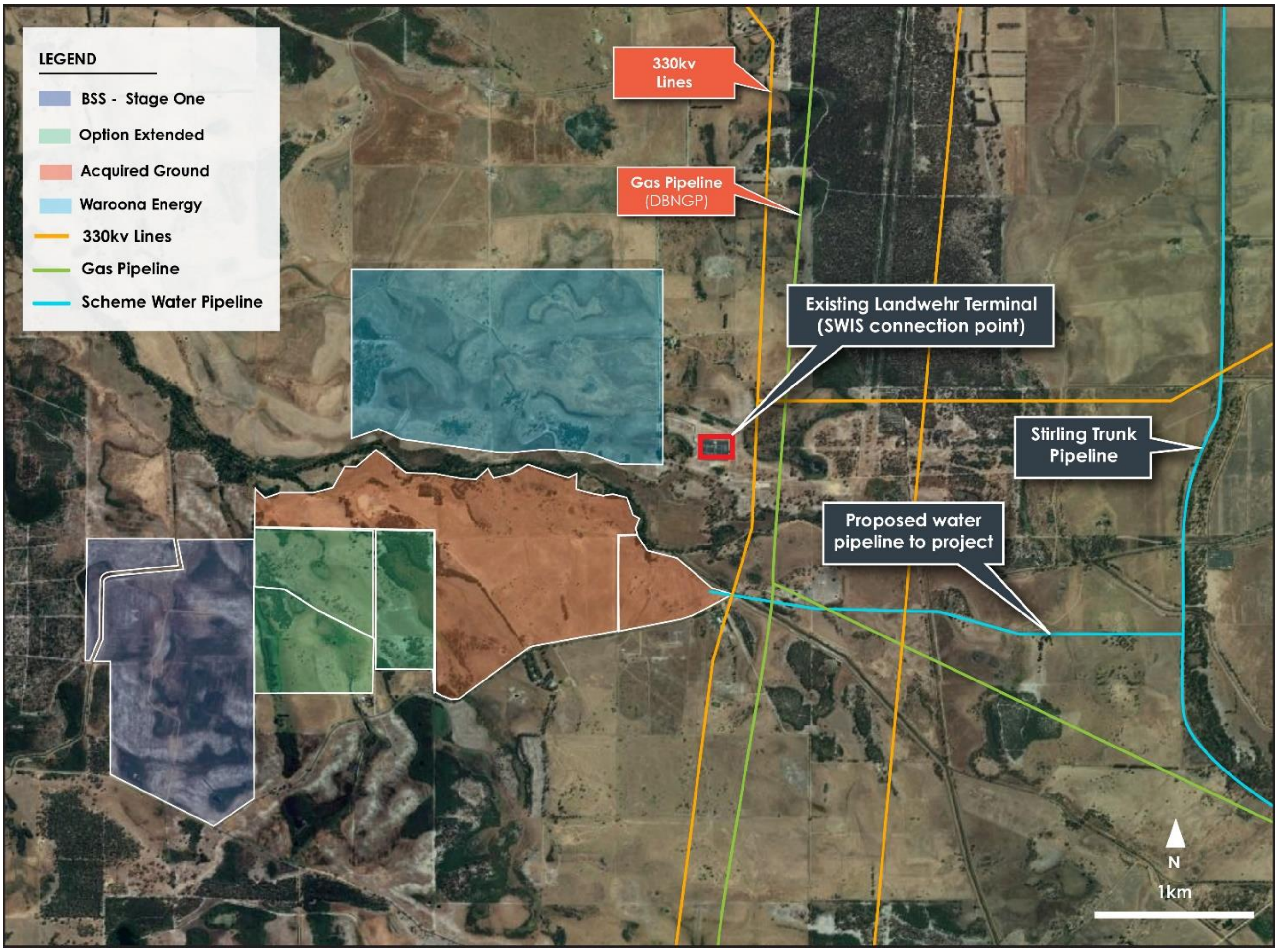

Figure 4: Land holdings and associated infrastructure location

Incite Energy, a specialist engineering, project management and financial analytics consultancy focussed on clean energy solutions was engaged by the Company to complete a Front-End Engineering Design (FEED) for the Stage One solar farm, including basis of design, preliminary solar farm layout and 330/33kV substation design, bill of materials, PV yield study, as well as a steady state generator model for consideration by Western Power. Incite Energy has also developed and submitted a dynamic generator model to Western Power.

2.1 Capital Costs

Based on the Incite Energy FEED and following optimisation study to develop the 114MW solar plant, CAPEX is estimated at $157.9m, which is a reduction of $8.4m or 5% compared to the Pre-Feasibility Study estimate. The driver for this capital reduction is primarily the relocation of the point of connection closer to the Landwehr Terminal. A breakdown of the solar capital costs is set out in in Table 3 below.

Capital Item	DFS A$ m
Project Management	14.1
Engineering	2.5
Network Connection	10.9
Solar Modules	44.1
Inverters	9.0
Tracker System	19.4
Transport / Logistics	5.5
Solar Farm Construction / Commissioning	44.4
Customer Substation	8.0
TOTAL (Including $10.3m contingency)	**157.9**

Table 3: Stage One Solar Capital Costs

2.2 Operating Costs

The annual operating cost estimate for the Stage One solar plant is $3.2m per annum, which remains in line with the PFS estimate. A breakdown of the costs is provided in the Table below.

Unit Cost	A$ m pa
Operating and Maintenance	1.4
Insurance	0.2
Asset Management	0.9
Land Rent	0.4
AEMO Market Fees	0.3
TOTAL	**3.2**

Table 4: Operating Cost Breakdown

2.3 Production

Figure 5 below highlights the forecast energy generation for the Stage One solar farm on a monthly basis. The total power generation is estimated at 245GWh during the first year of production. Degradation of 0.3% per annum is applied thereafter.

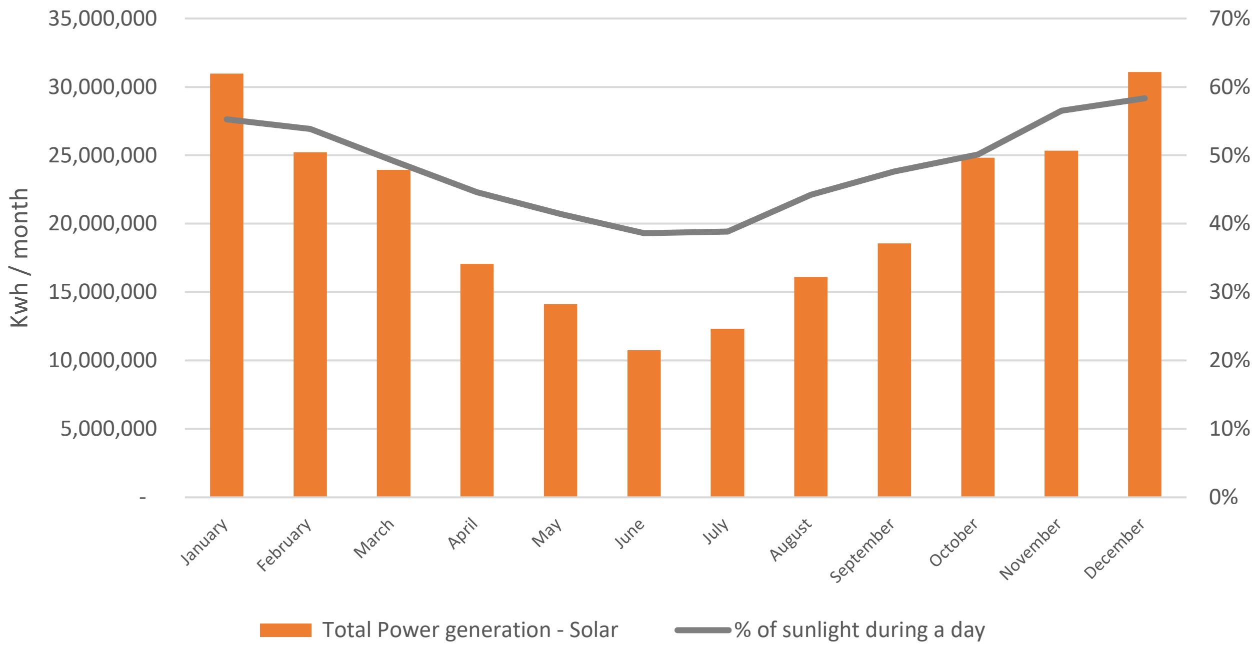

Figure 5: Forecast solar power generation on a monthly basis

3. Hydrogen Production Facility

Global engineering firm GHD completed the Pre-Front End Engineering Design (Pre-FEED) assessing a hydrogen production facility based on a 36 MW electrolyser. The GHD Pre-FEED study was completed with the following scope and assessment:

- 36 MW Alkaline Electrolyser;
- Plug-and-play infrastructure for hydrogen compression system (up to 400 bar);
- Plug-and-play infrastructure for hydrogen storage systems to store 5 days (79 tonnes) of production;
- Hydrogen export facilities via the following options:
  - Blending into the Dampier Bunbury Natural Gas Pipeline;
  - Road export via hydrogen truck trailer;
  - Use in a future onsite 30MW Fuel Cell system (Hydrogen Peaking Plant);
- Utilities for the plant including water, wastewater, and drainage;
- Power requirements;
- On site Infrastructure including major equipment buildings, warehouses and offices;
- Plug-and-play for expansion up to 150MW.

Following completion of the Pre-FEED, the Company engaged the market for pre-tender offers from leading global engineering, procurement and construction firms for the construction of the hydrogen facility. The Company carried out this process to provide further confidence regarding the capital cost estimates.

3.1 Capital Estimate

The Pre-FEED study combined with the market engagement process resulted in an estimate of total direct capital costs for the Stage One 36MW hydrogen facility of $68.9m, increasing to $84.6m when pre-production and contingency is accounted for. A breakdown of the cost estimate is highlighted in the table below.

Direct Construction Costs – Hydrogen Facility	A$ m
Civil works	9.3
Hydrogen Process Facility	32.9
Loading and blending	0.2
Utilities	1.2
Instrumentation and interconnecting piping, fittings and valves	6.1
Buildings	4.8
Electrical	14.4
Total Construction Cost	**68.9**
Contingency	*9.7*
Commissioning and First Fills	*1.2*
EPCM Services / ESP	*3.0*
Owners Team	*1.8*
Total Cost	**84.6**

Table 5: Capital cost estimate for Hydrogen facility construction

3.2 Operating Costs

The Pre-FEED estimate for total direct operating cost on an annualised basis for a 36MW hydrogen facility was $3.5m per annum. A breakdown of the cost estimate is detailed below.

Direct Operating Costs – Hydrogen Facility	A$ m
Brine Pond Cleanout Costs	0.2
Electrolyser Overhaul (annualised)	1.0
Equipment O&M	0.8
Site Labour	0.7
Miscellaneous	0.2
Total Direct Operating Cost (pa)	**2.9m**
Water costs	**0.6m**
Total Operating costs - Hydrogen	**3.5m**

Table 6: Operating cost estimate for Hydrogen facility

The Company has finalised a water supply agreement with Water Corporation. The estimated water cost is approximately $0.6m per annum based on expected consumption. A more detailed discussion of water supply and costs is contained in Section 5.

Notably, the largest direct cost associated with the Project's hydrogen production is the purchase of additional energy during low/no-generation solar conditions. The DFS assumes the purchase of approximately 140,000 MWh per annum (an average quantity for years 1 to 5 exclusive of marginal line losses but including capacity and network charges) at a cost of

$70/MWh. A portion of this cost is recovered through excess energy sold during peak solar conditions. A detailed breakdown of this is outlined in section 4 of this report.

3.3 Hydrogen Production

The forecast for green hydrogen production is 4.9 Mkg pa. This is an increase of 0.5 Mkg pa compared to the PFS. The driver for this increase in production is an improved average annual utilisation (or load factor) for the electrolyser of 84% (PFS 75%). In order to increase the load factor, the DFS contemplates the purchase of additional power from the grid during off-peak periods (non-sunshine hours) provided the cost to purchase is no more than $70MWh. A breakdown of the key outputs and assumptions compared to the PFS is highlighted in the Table below.

Hydrogen metrics	Unit	PFS	DFS	Difference
Total energy consumption – Electrolyser	MWh	241,000	272,000	(31,000)
Energy supplied by solar	MWh	132,000	132,000	-
Energy purchased from the grid	MWh	109,000	140,000	(31,000)
Average cost per MWh	A$	71	68	3
Annual cost of energy purchased from the grid	A$m	7.7	9.5	(1.8)
Hydrogen production	Mkg	4.4	4.9	0.5

Table 7: Hydrogen production metrics

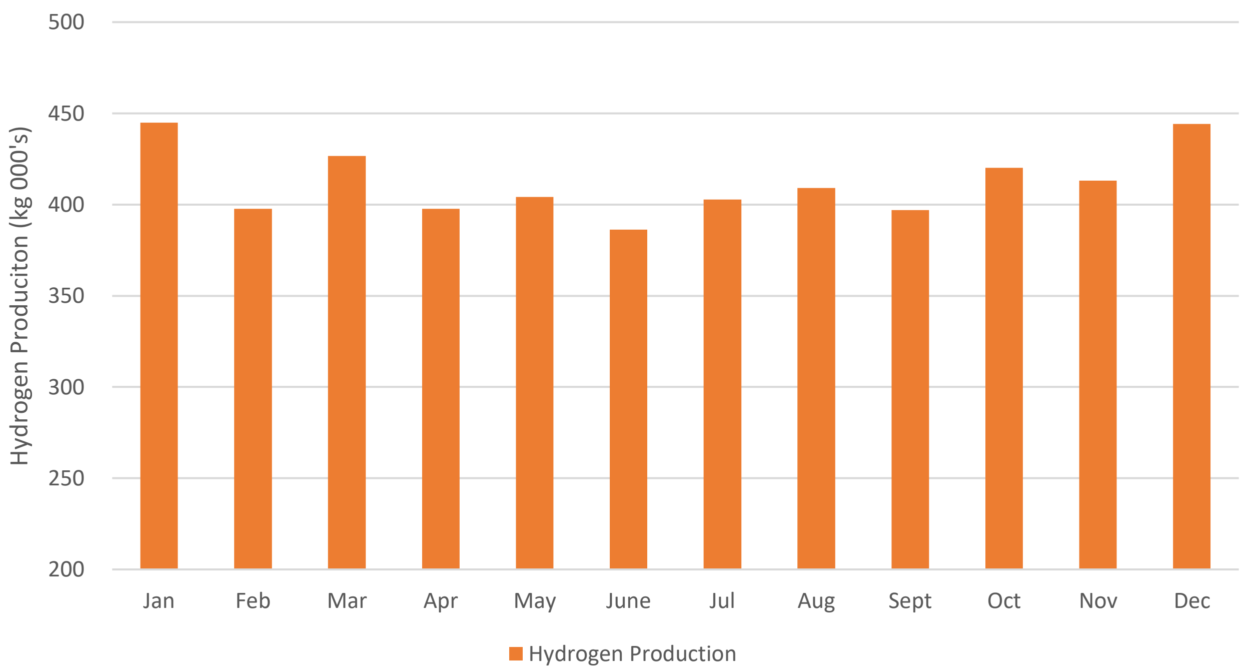

Figure 6: Hydrogen production per month

As highlighted above the load factor fluctuates between summer and winter periods. The study assumed power would only be purchased between 9pm to 6am at an approximate cost of $68MWh when demand for power decreases and there is no solar energy available.

4. Electricity Grid Connection

Due to the lower energy demand profile of the hydrogen production plant relative to the solar production plant, only a portion of the energy produced from the solar plant, up to the electrical capacity of the electrolyser and balance of plant, can be utilised to produce hydrogen. As a result, the Project has unused energy available for sale (excess power).

One of the most significant aspects of the Project is the proximity to the electricity grid, the SWIS. The Project is approximately 4km from the Landwehr Terminal, a major connection point into the SWIS. Using the grid as an opportunity for energy arbitrage maximises the value of the solar plant at the same time as powering the electrolyser. The connection means there is a stable supply of electricity to provide the requisite energy for the electrolyser at all times whilst facilitating sales of excess power in other periods when pricing for sales is higher.

Figure 7: Landwehr Terminal – 330kV

4.1 Excess Power Sales

During periods of excess power production, the Company can sell this power directly into the balancing market[6] or to a consumer via a power purchase agreement (PPA). The Landwehr Terminal is on 330kV power lines providing the Project with access to a potential market comprising large industrial customers in the South West, stretching from Bunbury and Collie in the south to Kwinana in the north.

In the DFS, the average excess energy sold was approximately 112,000 MWh per annum. The average target price for sales over the life of the Project is assumed to be $30/MWh (excludes LGC) meaning $3.3m per annum. This is lower than the price assumption in the PFS of $38/MWh and $4.5m per annum.

[6] *https://aemo.com.au/en/energy-systems/electricity/wholesale-electricity-market-wem/participate-in-the-market/information-for-current-participants/balancing-market-participation*

Subject to potential demand, the Company will consider expanding the size of the electrolyser for Stage One from 36MW to 72MW. This will utilise the excess energy produced and maximise economic returns as the hydrogen industry develops.

4.2 Drawing power from the grid in off-peak

To ensure continuous operations of the electrolyser during hours when no or inadequate solar power is generated, a supply of electricity to meet the energy draw of the electrolyser will be available from the grid. It is assumed in the DFS that power is drawn from the grid during off-peak times of the day.

The DFS also takes into account increased energy consumption as outlined in section 3.3 due to increased utilisation of the electrolyser. This results in an approximate average cost of $68/MWh or $9.5m per annum.

4.3 Retirement of Large-Scale Generation Certificates

An accredited power station may create Large-Scale Generation Certificates (LGCs) for eligible electricity generated. Eligible electricity is electricity generated from the power station's renewable energy sources. One LGC can be created per megawatt hour (MWh) of eligible electricity generated by a power station. The amount of eligible electricity generated by a power station is to be worked out in accordance with the LGC general formula[7]. The DFS assumed LGC pricing of $45 per LGC.

To ensure hydrogen from the Project remains green, an LGC would be retired for every MWh of energy drawn from the SWIS. Stage One assumed power purchased from the grid would be 140,000 MWh per annum.

4.4 Verification of green hydrogen production

Hydrogen Australia, a division of the Smart Energy Council (the independent body for the Australian smart energy industry), has commenced a process, through an independent auditor, to examine Stage One of the Project in order to provide a pre-certification assessment regarding the Project's ability to produce green hydrogen.

The project pre-certification will give assurance to the Company and its customers that it is capable of producing the specified volume of green hydrogen, provided it is built and operated according to specifications. Further, it will also provide Frontier with a framework for certification of additional facilities which utilise a similar process.

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[7] *The nominated person for an accredited power station may create large-scale generation certificates (LGCs) for eligible electricity generated by the power station. Eligible electricity is electricity generated from the power station's renewable energy sources. One LGC can be created per megawatt hour (MWh) of eligible electricity generated by a power station. The amount of electricity generated by a power station is to be worked in accordance with the large-scale generation certificate general formula.* https://www.cleanenergyregulator.gov.au/RET/Scheme-participants-and-industry/Power-stations/Large-scale-generation-certificates

Further, the certification audit will provide an assessment of any and all direct and indirect greenhouse gas emissions associated with the production and storage of green hydrogen at the Company's facility, excluding the emissions related to the construction material materials used in the facility. This includes an assessment of and confirmation that 100% renewable electricity, or another renewable process, is being used to make the renewable hydrogen at the facility[8].

The Renewable Energy Target is an Australian Government scheme (through the Clean Energy Regulator) designed to reduce emissions of greenhouse gases in the electricity sector and encourage the additional generation of electricity from sustainable and renewable sources.

The Clean Energy Regulator is also developing a Guarantee of Origin Scheme that will enable Australian businesses to verify hydrogen from renewable sources. The Scheme will measure and display key attributes of how and where a unit of hydrogen is produced including its carbon intensity[9].

4.5 Guarantee of Origin scheme

Frontier's hydrogen net-zero pre-certification aligns with the Federal Government proposed Guarantee of Origin Scheme. In August 2021, the Department of Industry, Science and Resources published a discussion paper titled 'Hydrogen Guarantee of Origin Scheme'. The paper set out proposed rules for Scope 2 greenhouse gas emissions, which for the Project would include greenhouse gas emissions from the generation of power taken from the grid.

The Greenhouse Gas Protocol[10] identifies a best-practice dual-reporting framework for Scope 2 emissions comprising both location-based and market-based reporting. Australia's Climate Active program, a partnership between Government and business, has aligned with this reporting practice for participants seeking carbon neutral certification under this program.

For the location-based method, emissions associated with electricity purchased from the main electricity grid in a state or territory are calculated by multiplying the quantity of electricity consumed by the average grid emission factor in kilograms of CO_2[11] emissions per kilowatt hour for the state or territory in which the consumption occurs. This is the methodology[12] for electricity consumption, where facilities use the National Greenhouse Account factor[13].

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[8] *In July 2020, the Australian Renewable Energy Agency (ARENA) identified green hydrogen projects to support in Australia. The program stipulated that in order for hydrogen to be classified "green", production must be 100% powered by electricity that is derived from:*

a) *on-site renewable electricity generation*
b) *retirement of Renewable Energy Certificates (RECs) or equivalent certificate*
c) *contracted electricity derived from a renewable Power Purchase Agreement (PPA), or a combination of the above.*

[9] https://www.cleanenergyregulator.gov.au/Infohub/Markets/guarantee-of-origin

[10] https://ghgprotocol.org/Third-Party-Databases/Australia-Department-of-Climate-Change

[11] *CO_2 equivalent, a common unit for the global warming potential of different greenhouse gases*

[12] *Under the National Greenhouse and Energy Reporting Act 2007*

[13] *https://consult.industry.gov.au/hydrogen-guarantee-of-origin-scheme*

For the market-based method, companies who purchase renewable electricity through contractual arrangements (such as through the purchase of Renewable Energy Certificates) are allowed to apply this renewable energy to reduce the emissions of the electricity used in production calculations. This approach means hydrogen production does not have to be physically co-located with or directly connected to the renewable energy generation[14].

Implementation of the market-based method may differ between countries as each country has their own mechanisms to account for renewable electricity claims, however a key principle is a requirement that renewable energy claims cannot be double counted. In Australia, the risk of double counting is mitigated through Renewable Electricity Certificates (e.g. LGCs). One certificate represents a unique claim on the zero emissions attribute of renewable electricity generation (note this is not legislated but how the market has interpreted the use of LGCs in the voluntary market)[15].

Frontier acknowledges that the Government's next steps include development and consultation on exposure drafts of legislation and implementation and operation of the scheme by the Clean Energy Regulator.

[14] *https://consult.industry.gov.au/hydrogen-guarantee-of-origin-scheme*
[15] *https://consult.industry.gov.au/hydrogen-guarantee-of-origin-scheme*

5. Water

A binding Water Supply Agreement has been executed with Water Corporation, the principal supplier of water in WA. This agreement ensures the availability of up to 1,250kl/day of water for the Project's green hydrogen production strategy.

Water will be supplied to the Project via the Stirling Trunk Main, which carries water from the Southern Dams and the Southern Seawater Desalination Plant to the Integrated Water Supply Scheme (IWSS). The Stirling Trunk Main is located approximately 3km from the proposed location of the hydrogen facility.

The consumption of water reflected in the DFS as compared to the PFS has decreased from 55,000L/hr to 27,500 L/hr. The PFS assumed larger amounts of daily water replacement for system losses and accounted for large volumes of "charge water". The Pre-FEED study confirmed the PFS assumptions were conservative and that, through system optimisation, the actual volume of water required was set a 27,500 L/hr.

The reduction in forecast consumption reduces the annual forecast cost for water in the DFS to $0.6m compared to $0.9m per annum in the PFS.

Figure 8: Stirling Trunk Main pipeline

6. Hydrogen Revenue

The Company is engaged in a process to secure offtake arrangements to commercialise Stage One. This process is currently on-going. The Company is confident that it will secure a preferred partner as foundation customer for Stage One offtake in the coming months.

6.1 Hydrogen market and pathway to production

Governments around the world continue to set ambitious decarbonisation targets and it is expected hydrogen will play a major role in meeting these targets. This includes in Australia, where the Government recently announced Australia's target to reduce emissions by 43 per cent below 2005 levels by 2030 and achieve net zero by 2050[16].

Whilst the demand for green hydrogen in the long term is clear, the market is still in its infancy. Given this, the Company assessed the most likely earlier adopters for hydrogen in the domestic market and has carried out work in relation to these opportunities.

6.2 Hydrogen blending in natural gas networks

The Dampier to Bunbury Natural Gas Pipeline (DBNGP) is Western Australia's most significant gas transmission asset and provides natural gas to Western Australia. A possible connection point to the DBNGP is located less than 0.3km from the proposed hydrogen plant location, where the DBNGP branches off to provide gas to Alcoa's Wagerup Alumina Refinery.

A study was carried out by the operator of the DBNGP, Australia Gas Infrastructure Group in relation to the blending of hydrogen into the DBNGP[17]. Based on this study, the Mainline South section of the DBNGP, essentially the section south of Kwinana, is technically suitable for up to 9% of hydrogen blended into the gas flow. Stage One hydrogen production would, based on average daily flow rates, constitute less than 1% of gas flowing in the DBNGP.

It is understood that an express legislative basis for hydrogen to be blended in gas transported in pipelines is being progressed in the Petroleum Legislation Amendment Bill and that steps are being taken for express reference to hydrogen within the regulated gas specification.

The DBNGP carries gas which is supplied into the domestic market under WA's Domestic Gas Reservation Policy. The Company continues to work with government and stakeholders as it believes that hydrogen could be used to increase the aggregate quantity of energy available to gas producers for domestic supply and positively reflect on LNG export.

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[16] *https://www.skynews.com.au/australia-news/chris-bowen-defends-new-climate-bill-and-slams-matt-canvan-for-pedalling-lies-about-renewables/news-story/83ef67018a55ae5fb7fcf1c06edd44c9*

[17] *https://www.wa.gov.au/government/publications/dampier-bunbury-natural-gas-pipeline-public-knowledge-sharing-report*

Figure 9: DBNGP connection point

6.3 Hydrogen for Energy Storage and Flexible Power Generation – Peaking Plant

Hydrogen can be used as a form of electricity storage in which energy is converted into hydrogen, which can be stored and then dispatched through hydrogen-fuelled power generation technology such as fuels, turbines, engines etc.

The Company's strategic location and connection to the SWIS enables energy which is produced by the solar plant and/or anywhere else on the grid to be stored as hydrogen. In this instance, the hydrogen plant will use the energy from the grid to produce and store hydrogen. This energy can then be dispatched again by using the hydrogen as fuel in combustion engines, gas turbines, or hydrogen fuel cells, the latter offering the best efficiency.

In December 2022[18], the Western Australian Government announced a Renewable Hydrogen Target aiming to drive local demand and assist emerging hydrogen production projects, which are essential to developing the State's hydrogen industry.

The initial target is for hydrogen to comprise one per cent of the South West's electricity generation by 2030 and represents an important first step in the development of a broader use-agnostic Renewable Hydrogen Target scheme. It has been estimated one percent energy onto the SWIS equates to approximately 90MW of electrolyser hydrogen generating capacity. Stage One comprises a 36MW electrolyser, over a third of this target.

[18] *https://www.mediastatements.wa.gov.au/Pages/McGowan/2022/12/WA-Government-takes-aim-at-Renewable-Hydrogen-Target.aspx#:~:text=The%20initial%20Target%20will%20seek,agnostic%20Renewable%20Hydrogen%20Target%20scheme.*

The Company has completed preliminary analysis of a hydrogen peaking plant, which could be built close to the hydrogen production point. Hydrogen would be stored in a series of hydrogen storage vessels and then used to produce power at the peaking plant during peak electricity demand periods. A plant which can quickly despatch firm, consistent power to the grid at key times is important to addressing the challenges created by increased intermittent renewable energy and plans to close down coal-fired base load generators. The Company believes this can be reflected in the value placed on hydrogen produced.

The Company has commenced an assessment for the peaking plant to be a consumer of hydrogen production both in the near term as well as for expansion opportunities. Additional information regarding this will be released in the coming months.

6.4 Replace diesel in the long-haul transportation industry

Given advancements in hydrogen fuel cell electric vehicles, most notably in long-haul vehicles, it is likely that long-haul transportation will be an early adopter for the hydrogen industry.

The Western Australian Government identified domestically produced green hydrogen as a key part of the strategy to reduce the reliance on diesel, which is all imported. Currently WA imports approximately 6.7b litres of diesel per year[19].

The Company remains committed to this sub sector of the industry and is in discussions regarding the development of a refuelling station in central Perth. The Company will provide an update regarding this strategy once the site for the initial station has been confirmed. This is expected in the coming months.

[19] *The West Australian – 6 June 2022*

7. Solar Revenue

Whilst the objective of the Project is to produce and sell a green hydrogen product, given the Project's base energy source is renewable electricity and the connection of the Project to the SWIS, the Project can generate additional revenue through three streams:

1) Excess energy sales
2) Reserve Capacity Payments; and
3) Large-Scale Generation Certificates (LGC).

The Company classifies this additional revenue as a credit against operating expenses. Below is a summary of the key inputs for each category and the difference compared to the PFS.

	Unit	PFS	DFS	Difference
Excess Energy	MWh	112,000	112,000	-
Average Price	MWh	38	30	(8)
Revenue generation from excess energy	**$ m**	**4.5**	**3.3**	**(1.2)**
Reserve capacity - energy	MW	24.5	24.5	-
Benchmark price – reserve capacity	MW	120	193	63
Revenue generation from reserve capacity	**$ m**	**3.0**	**4.8**	**1.8**
LGC units available for sale	LGC	134,000	104,000	(30,000)
Average LGC price	$	35	45	10
Revenue generation from excess LGC sales	**$ m**	**4.7**	**4.7**	**-**
Total – solar by-product revenue	**$ m**	**12.2**	**12.8**	**0.6**

Table 8: power related revenue streams

7.1 Excess energy sales

During peak energy period excess energy produced at the Project can be sold to generate additional revenue. This power can either be sold via:

- Bilateral agreements with industrial users connected to the grid under PPAs; or
- Traditional sales into the balancing market onto the grid through the Market Operator.

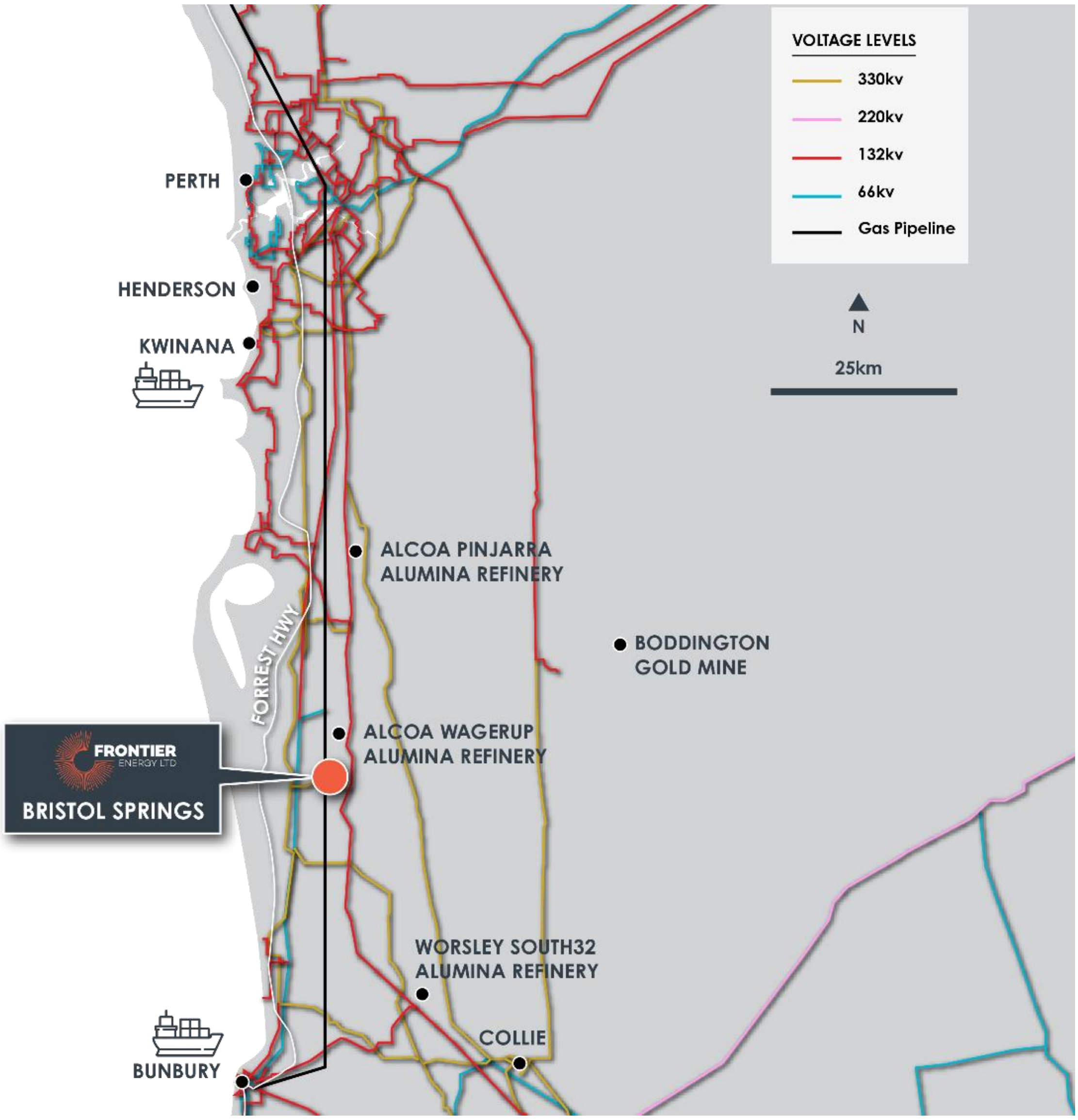

Figure 10: Project location showing SWIS and major industries nearby

The Study assumed excess energy of approximately 112,000 MWh (year 1) being sold at an average price of $30MWh generating $3.3m per annum. The PFS assumed the same excess energy sales, however a 6% higher energy price of $38MWh for $4.5m per annum was assumed.

7.2 Reserve Capacity Credits

In addition to selling excess power, being connected to the SWIS via the Landwehr Terminal allows for the Company to participate in the Reserve Capacity Market and benefit from Reserve Capacity Credits under the Reserve Capacity Mechanism (RCM).

The RCM is an administered capacity market and is designed to ensure that there is adequate generation and Demand Side Management (DSM), e.g. controllable load, capacity available in the system to meet forecast peak electricity demand plus a margin to allow for forecast errors or plant failures.

Under the RCM, generation plants and DSM facilities are certified and allocated capacity credits. Electricity retailers are required to procure capacity credits in proportion to their share of the electricity load in the twelve Peak SWIS Trading Intervals[20]. The retailers may meet this obligation by either purchasing capacity credits directly from generators such as Frontier, under bilateral contracts or procuring capacity credits via Australian Energy Market Operator (AEMO) at an administered price (known as the Reserve Capacity Price or RCP).

The Study assumed a price of $193,400 per MW. This price was provided by AEMO for the 2025/26 capacity year[21]. This generates approximately $4.8m per annum. The PFS assumed a price of $120,000 per MW capacity generating $3m per annum.

7.3 Large-Scale Generation Certificates (LGC)

The nominated person for an accredited power station may create LGCs for eligible electricity generated by the power station. This effectively is the carbon credit market in Australia.

Eligible electricity is electricity generated from the power station's renewable energy sources. One LGC can be created per megawatt hour (MWh) of eligible electricity generated by a power station. The amount of electricity generated by a power station is to be worked out in accordance with the LGC general formula.

The Study assumed LGC pricing per unit of $45 (PFS - $35), generating approximately $4.7m per annum. There was a reduction in the number of units available for sale with 104,000 LGCs per annum available compared to the PFS of 136,000 LGCs. This reduction was due to an increase in the number of units retired due to power consumed from the grid. The LGC price however increased significantly in the year compared to our previous estimate. To ensure this remains "green" additional LGC units are retired.

[20] https://www.aemo.com.au/energy-systems/electricity/wholesale-electricity-market-wem/wa-reserve-capacity-mechanism/certification-of-reserve-capacity

[21] https://www.erawa.com.au/cproot/23058/2/-BRCP.2023---2023-benchmark-reserve-cap_e-for-the-2025-26-capacity-year---Final-Determination---for-publication-clean-.PDF

8. Project Financing

The Company has commenced discussions regarding project financing and has been advised debt financing of between 60% to 80% through traditional debt providers could be achieved. These discussions include with major financial institutions both in Australia and abroad.

In addition to these traditional financiers, given the importance of the development of a green hydrogen industry in Australia, there are a number of other groups that will likely be able to assist with project development, including:

8.1 Clean Energy Finance Corporation (CEFC)

The CEFC has a unique mission to accelerate investment in Australia's transition to net zero emissions. CEFC 'invest to lead the market, operating with commercial rigour to address some of Australia's toughest emissions challenges'.

CEFC is working with co-investors across renewable energy generation and energy storage, as well as agriculture, infrastructure, property, transport and waste. Through the Advancing Hydrogen Fund, CEFC is supporting the growth of a clean, innovative, safe and competitive hydrogen industry. As Australia's largest dedicated cleantech investor, CEFC continues to back cleantech entrepreneurs through the Clean Energy Innovation Fund. With $10b to invest on behalf of the Australian Government, CEFC works to deliver a positive return for taxpayers across their portfolio.

8.2 Australian Renewable Energy Agency (ARENA)

ARENA was established by the Australian Government in 2012.

ARENA's purpose is to support the global transition to net zero emissions by accelerating the pace of pre-commercial innovation, to the benefit of Australian consumers, businesses and workers.

In 2019, ARENA launched the Renewable Hydrogen Development Funding Round to help fast track the development of a renewable hydrogen industry. To date there have been 632 projects funded by ARENA and total funds invested total $1.96b.

ARENA has stated these are the key areas it will look to assist companies with the development of their hydrogen projects:

- feasibility studies or development funding for large-scale electrolyser projects;
- feasibility studies or development funding for export projects;
- commercial-scale deployments of large-scale electrolysers focused on industries and applications with large potential demand for hydrogen;
- demonstration-scale projects involving electrolysers in transport or remote area power systems with hydrogen production replacing diesel generation;
- projects that support the implementation of the National Hydrogen Strategy; and
- projects that demonstrate the use of hydrogen in industrial processes.

8.3 Australia's National Hydrogen Strategy

In response to other nations taking a proactive approach to the development of a renewable energy hydrogen industry in their respective countries, most notably, the USA's US$437b Inflation Reduction Act that will provide a tax credit of up to US$3 per kg of hydrogen for the first 10 years of operation, in February 2023 the Australian Government announced a review of the National Hydrogen Strategy[22].

The Australian Government has stated that it "…will be leading a Review of the National Hydrogen Strategy to ensure Australia remains on a path to be a global hydrogen leader by 2030 on both an export basis and for the decarbonization of Australian industries. The review of the Strategy will take account of developments globally and in Australia since the original strategy was developed, including the impact of the Inflation Reduction Act and other policies to support hydrogen emerging overseas".

[22] https://www.dcceew.gov.au/energy/publications/australias-national-hydrogen-strategy#:~:text=Australia's%20National%20Hydrogen%20Strategy%20sets,explores%20Australia's%20clean%20hydrogen%20potential

9. Government Support

The Company has received strong support to date from the Western Australian Government which has publicly stated that the Company's Project is potentially one of importance to the State to ensure the establishment of a local hydrogen industry[23].

Comments attributed to Deputy Premier and Hydrogen Industry Minister Roger Cook:

> *"The Bristol Springs Project is a fantastic example of a WA firm leading the way to becoming one of the lowest cost producers of Australian-made renewable hydrogen.*
>
> *"The McGowan Government is committed to assisting such emerging hydrogen production projects, as we work to establish WA as a significant producer, exporter and user of renewable hydrogen.*
>
> *"Renewable hydrogen will be critical for hard-to-abate sectors, such as industrial processing and transport, to reduce their emissions and help the State achieve net zero greenhouse gas emissions by 2050."*

In addition to this, the WA Government awarded the Project "Lead Agency Status". This recognises the importance of the Project for the development of the renewable energy industry in WA, including the development of a green hydrogen industry.

The Lead Agency framework is designed to ensure proponents are guided effectively through all government approvals processes. Lead Agency Case Management support, as confirmed for the Project, is only awarded to projects that are of significance to the State.

The Department of Jobs, Tourism, Science and Innovation (JTSI) is the lead agency for the Project and the direct facilitator between the Government and the Company.

JTSI involvement includes the following responsibilities:

- Negotiating and managing agreements between the Company and the WA Government;
- Promoting Western Australian exports and attracting direct foreign investment; and
- Developing and coordinating State-significant projects with the State's infrastructure.

Lead Agency Case Management support has been granted to the Company for at least the next three years.

[23] *WA Government Media Statement dated 14 March 2023*

10. Next Steps

As referred to above, the one of the main priorities for the Company at present is securing offtake with a foundation customer, and the Company is in the advanced stages of a process for engaging with a number of potential parties to achieve this.

On achieving offtake success, the Company will be in a position to progress the discussions it has already commenced with a range of Australian and International banks who are seeking renewable energy projects to finance. The global transition to clean energy is expected to accelerate and numerous banks and other financial institutions are playing a leading role in financing greenfield construction of renewable energy projects.

The Company is also investigating the various grants and credits which are available at both State and Federal Government level to support funding the development of the Project. The Company also continues to assess expansion opportunities, as well as long-term downstream business opportunities.

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

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

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About Frontier Energy

Frontier Energy Ltd (ASX: FHE; OTCQB: FRHYF) is developing the Bristol Springs Green Hydrogen Project (the Project) located 120km from Perth in Western Australia. The Company recently completed a Definitive Feasibility Study[1] that outlined the Project's potential to be both an earlier mover and one of the lowest cost green hydrogen assets in Australia.

The Project benefits from its unique location surrounded by major infrastructure. This reduces operating and capital costs compared to more remote hydrogen projects, whilst also being surrounded by likely early adopters into the hydrogen industry in the transition from fossil fuels.

[1]ASX Announcement 20th March 2023

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