



# At the forefront of Australian green hydrogen production

Non-Deal Australian Institutional Roadshow

ASX: FHE | March 2023

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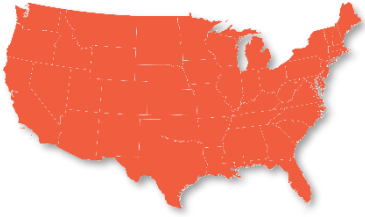
## DEFINATIVE FEASIBILITY STUDY

For information in this document relating to the Definitive Feasibility Study (DFS), refer to ASX announcement dated 20 March 2023. The Company confirms that in relation to the DFS announced on 20 March 2023, it is not aware of any new information or data that materially affects the information included in the original market announcement and that all material assumptions underpinning the forecast financial information included in that announcement continue to apply and have not materially changed.

## ACKNOWLEDGEMENT OF COUNTRY

Frontier Energy acknowledges the traditional custodians throughout Australia and their continuing connection to the land, waters and community. We pay our respects to all members of the Aboriginal communities and their cultures; and to Elders both past and present.

# Government action is fast tracking a global hydrogen industry

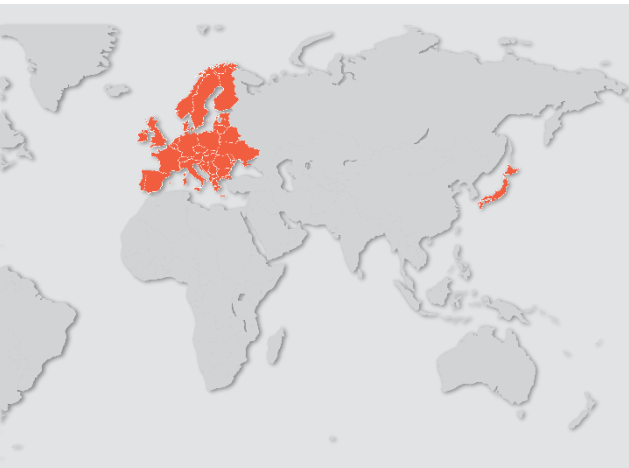


## USA – Leading the world in renewable energy following the Inflation Reduction Act (IRA) (\$US437 billion)<sup>1</sup>

Changed the game for hydrogen and renewables globally as it super charges the development of these industries in the USA

*IRA will provide a tax credit of up to US\$3 per kg of hydrogen*

Forced other nations to re-examine their commitment to the development of the hydrogen industry as major development relocate to the USA



## World leaders in the sectors – Europe and Japan

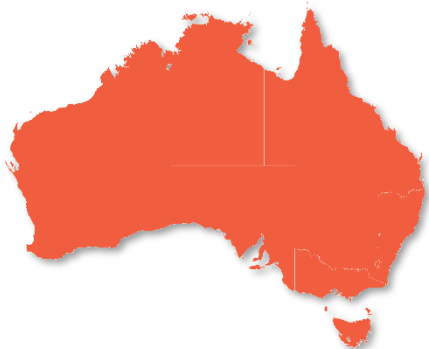
The EU has a requirement to develop its hydrogen industry due to its ambitious carbon emission targets (55% reduction by 2030<sup>2</sup>) and requirement for energy diversity following the Ukraine/Russian conflict

The EU has set a target to produce 10Mt and import 10Mt of renewable hydrogen by 2030<sup>2</sup>

*Funding solution in place, however being reviewed in response to the IRA*

Japan is a world leader in the development of hydrogen-related technologies and policy. It has targeted to become carbon neutral by 2050<sup>3</sup>

*Japan has established a 2 Trillion Yen (A\$24Bn) green innovation fund<sup>3</sup> to assist meeting its carbon target*



## Worlds best conditions for renewable energy - Australia

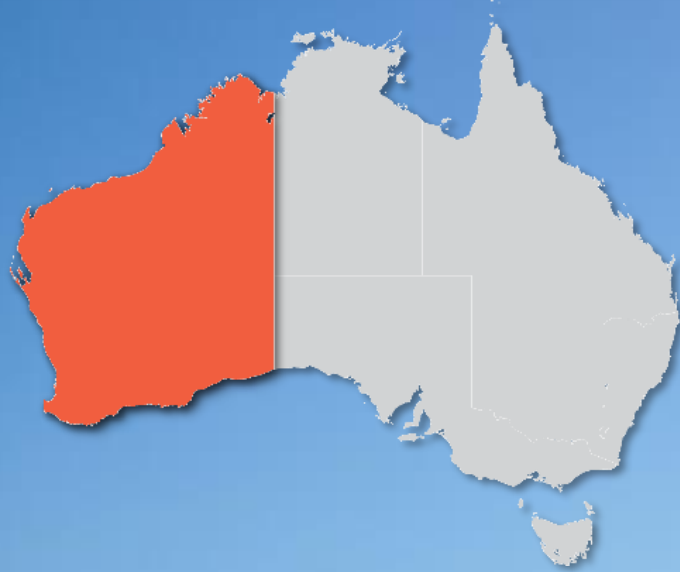
Australia has arguably the best environment for hydrogen production globally, given its excellent conditions for renewable energy (solar and wind) as well as significant land availability

The country aims to become a leader in hydrogen for both export and domestic decarbonisation targets

Funding is available through Australian Renewable Energy Agency (ARENA) and Clean Energy Finance Corp. (CEFC); however, the Government has acknowledged more funding support is required to match the IRA<sup>4</sup>



# What is Western Australia doing to support industry



## Export Target<sup>1</sup>

Match LNG exports - WA is a global leader providing 12% of global supply

## Domestic target for Hydrogen<sup>1, 2</sup>

- Targeting the displacement of the diesel industry in WA which imports 6.7Bn L pa
- Government target 10% hydrogen in DBNGP (gas pipeline)
- Hydrogen Target for electricity generation on the SWIS of 1% (90MW electrolyser)
  - *Aim of these targets is to drive local demand and assist emerging hydrogen producers*

## Funding Packages<sup>3</sup>

\$3.8 billion to assist in replacing coal power energy at Collie (50km from the Project) with new renewable energy developments as well as other funding incentive schemes

## Direct support and awareness of the Project from the Government

Awarded Lead Agency Status – additional support from Department of Jobs, Tourism, Science and Innovation (JTSI)

## 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”.<sup>4</sup>***

# Existing infrastructure puts the Bristol Springs Project in a class of its own



Water access ✓

Own the land ✓

Gas pipeline ✓

Grid connection (battery + foundation customer) ✓

Local skilled workforce ✓

- Without this critical supporting infrastructure in place, initial capex would likely be +\$1bn<sup>1</sup>, making the Project's development unachievable for a junior company

## DFS for Stage One confirms Bristol Springs as one of Australia's lowest cost<sup>2</sup>, near term green hydrogen producers

- 4.9M kg pa of green hydrogen production at a unit cost of A\$2.77/kg (inc. capex)
  - One of the lowest reported green hydrogen costs in Australia <sup>2</sup>
- Low Initial Capital Cost - \$242.5m (114MW solar + 36MW electrolyser)
  - Low cost debt and incentives to minimise future dilution

## Commercialisation pathway advanced and well understood

- On-going discussions with multiple parties regarding foundation customer/offtake
- Initial consumption - gas pipeline (0.5km from the Project) and/or peaking plant (flexible power generation & storage – connected to the grid)
- Long term consumption (refuelling and export) – location advantage to major highway and multiple ports. Additional initiatives being assessed

## Significant growth potential for +1GW of energy

- Landholding (868ha) under control and nearby opportunities allows for a renewable energy target of 1GW energy or ~ 80,000t hydrogen pa

## CAPITAL STRUCTURE

292.4m

Shares on issue

34.8m

Options

\$126m

Market Cap  
At \$0.43/share

~\$10m

Cash  
Dec 22  
Exc. \$9m investment in MZN  
at C\$0.06/share



**Samuel Lee Mohan**  
Managing Director  
Technical



**Grant Davey**  
Executive Chair  
Commercial



**Chris Bath**  
Executive Director  
Financial

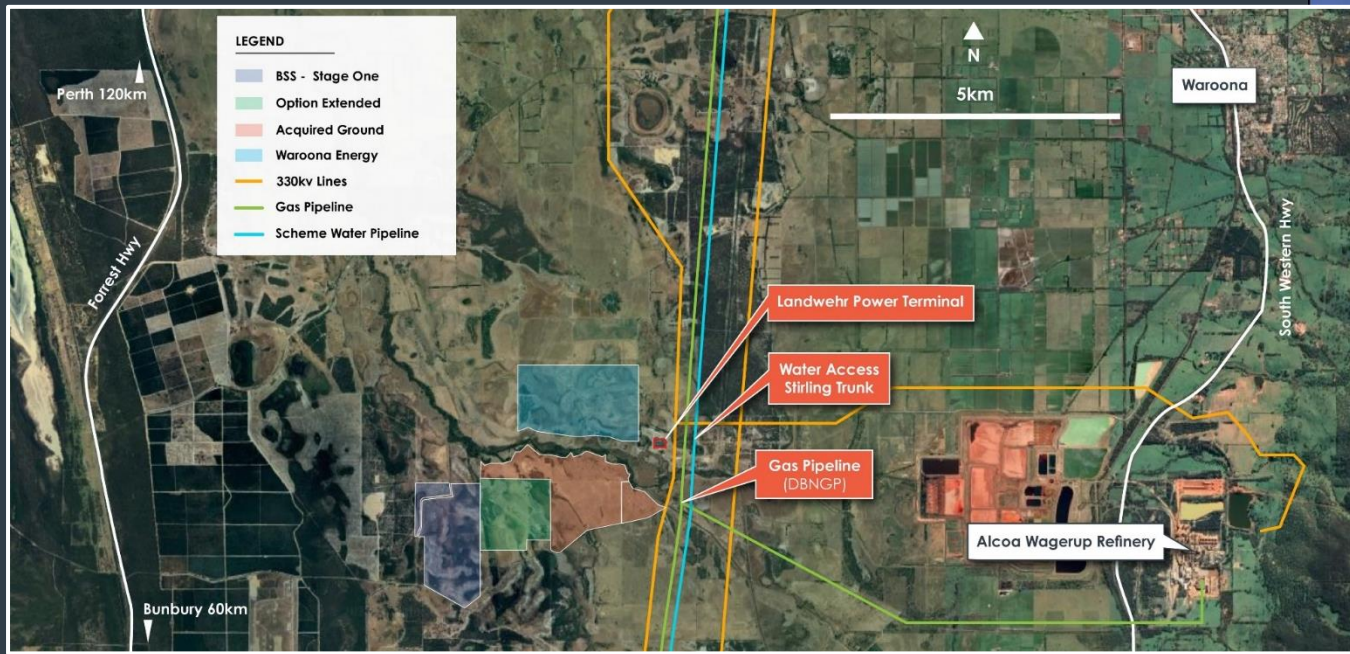


**Dixie Marshall**  
Non - Executive Director  
Government  
& Comms.



**Amanda Reid**  
Non- Executive Director  
Government & Comms.





# Bristol Springs Hydrogen Project

*Existing surrounding infrastructure puts Frontier in a class of its own*

120km from Perth and surrounded by world class, existing infrastructure (with access & availability) that provides a major advantage for green hydrogen production and distribution/consumption

**Landwehr Terminal / SWIS (330kv Lines)** – secured access to a bay - no further access available to third parties on existing infrastructure

**Water access (~9L for 1kg of hydrogen)** – binding offtake with the Water Corporation secured (avoids desalination – major cost, time and approvals)

**Gas pipeline (DBNGP)** – conduit for Stage One production (H2 target 9%)

**Local skilled workforce<sup>1</sup>** – 8km to Waroona, 50km to Collie, 60km to Bunbury  
Population - Waroona (5k), Collie (9k) Bunbury (46k) & Perth (2.6m)





# DFS outlines Low-Cost Green Hydrogen Production <sup>1</sup>



- The DFS for Stage One green hydrogen production confirmed the potential to be a low-cost, early mover in the green hydrogen industry
- Hydrogen Production - 4.9 Mkg pa
  - Increase by 0.5Mkg pa compared to PFS (4.4Mkg) due to increased load factor (84% vs. 75%) - increased utilisation of the grid in off peak solar conditions
- Low total unit cost of \$2.77 / kg hydrogen (inc. capex). The low cost is driven by:
  - Low capex due to the Project's ability to access surrounding existing infrastructure; and
  - The Project's ability to utilise existing mechanisms for solar revenue (classified as a negative expense in the Study)
- Low initial capital cost - \$242.5m
  - \$157.9m solar and \$84.6m hydrogen – 3% difference to PFS
- Funding - Strong interest from multiple major financial institutions both locally and abroad
  - Grants and additional funding/incentives likely from Government
- Near term expansion - 72MW electrolyser
  - Production capacity to nearly double through increasing the size of the electrolyser without additional solar energy required

Hydrogen production (pa)		4.9M ka pa	
Costs – Direct Operating		Cost (A\$m pa)	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)			3.30
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 solar revenues			5.38
Less By Product Revenues (Solar related)			
Excess power sales on the grid Average Price - \$30/MWh		(3.3)	(0.67)
LGCs Average Price - \$45		(4.7)	(0.96)
Capacity Credit Average Price - \$193,000		(4.8)	(0.98)
Total By-Product Revenues			(2.61)
Total cost per kg of Hydrogen produced			2.77

# Where will Stage One hydrogen be consumed?

Currently hydrogen (94Mt 2021) is produced from fossil fuels and consumed for refining and industrial – less than 1% from renewable energy<sup>1</sup>

By 2030, the International Energy Agency has forecast 175Mt of production, with 35% coming from green hydrogen<sup>2</sup>

Example of a transition in renewables<sup>3</sup>  
Australian EV new car sales – 0.12% (2016)  
Australian EV new car sales – 3.8% (2022)

The market for hydrogen is still in its infancy, however existing infrastructure & government initiatives are providing a pathway for early demand/consumption

Offtake discussions  
underway for foundation  
customer



## Dampier to Bunbury Natural Gas Pipeline (DBNGP)

- 0.5km from the Project
- Study confirms pipeline can take up to 9% hydrogen, importantly at the Project's location
  - *Stage One contribute <0.5%. No other likely contributors identified at present*
- Lobbying Government to classify hydrogen as a gas which could see it substitute/replace natural gas (DOMGAS)
  - *Decarbonisation of the pipeline*
  - *Arbitrage opportunity for virtual LNG swap*



## Peaking Plant

- Connection to the 330KV line to the SWIS
- Government target 1% hydrogen on the WA power network
- Collie coal power station closure by 2029
- A Peaking plant stores gas (hydrogen) which then is turned into electricity during peak demand (ie: 3pm to 9pm)
  - *Provides energy security for the network*
  - *Strong government support for energy storage solutions*
  - *Techno-economic study to assess the peaking plant potential underway*

1 - <https://iea.blob.core.windows.net/assets/c5bc75b1-9e4d-460d-9056-6e8e626a11c4/GlobalHydrogenReview2022.pdf> 2 -

<https://www.reuters.com/breakingviews/hydrogen-is-elemental-us-eu-green-compromise-2023-02-10/> 3 - <https://www.pv-magazine-australia.com/2022/10/18/australian-ev-market-share-grows-65-in-2022/#:~:text=Up%20to%20September%202022%2C%2026%2C356,of%20EV%20report%20published%20Friday.>



# What are the plans for future expansion

*Land under the Company's control (868ha) provides a medium term target of +1GW of renewable energy. This equates to around 80,000t pa of green hydrogen production. At this scale as well as the continued evolution of the market additional opportunities can be accessed*



## Refuelling Station

- Long haulage transportation has been identified as a key consumer of hydrogen in the future
  - *Likely +5years away before implementation commences*
- Company in advanced discussions for the development of the first hydrogen refuelling station in Central Perth
- Future plans to develop a hydrogen highway throughout WA
- Project is adjacent to the major road between Perth and South West WA



## Export

- Multiple ports within close proximity including Bunbury (60km) and Kwinana (80km)
  - *BP is converting its Kwinana refinery into an "Integrated Energy Hub" their flagship global renewable energy site*
- Hydrogen export requires significant scale which is achievable at the Project through future expansion
- Transportation generally required the conversion of hydrogen into either ammonia, methanol or liquefied hydrogen



## Frontier is committed to creating long term sustainable value for future generations

# Sustainability

*At Frontier, we care for our community, environment, and all stakeholders, by delivering safe, reliable and sustainable clean energy solutions*

- Our solar energy and green hydrogen Project will provide a significant contribution to both the Federal and State decarbonisation strategy
- The Bristol Springs Project will create 300 jobs during construction
  - *Once construction commences the Company is targeting on-going future expansion*
- No clearing of conservation significant flora is required for Stage 1 solar farm development
- We are focused on diversity and inclusion with 44% female representation in the leadership team<sup>1</sup>
- We are on track to deliver our inaugural Sustainability Report in Q2 2023

<sup>1</sup> Leadership team includes Board and Executive Management (a total of nine people)





# Frontier's Path to Production

## BUILDING A SCALEABLE RENEWABLE ENERGY HUB IN SW WA



Leading the pack for commercial green hydrogen production in WA



Grid-firming & energy security support to the SWIS as the State transitions from coal



Strategically located near major infrastructure and industry



Major job creation within a new industry



Key contributor to Australia's hydrogen production strategy

## Major milestones through 2023

Definitive  
Feasibility Study



Offtake  
negotiations



Project  
Financing



Commence  
Construction



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