Parmelia Green Hydrogen Project

(PGH2)

The Parmelia Green Hydrogen Project will produce 71.2 tpd of green hydrogen via electrolysis of water using renewable electricity and transport the H_2 to the Kwinana Industrial Area via APA's repurposed Parmelia Gas Pipeline. With increasing future demand, the Project will be scaled to 143.5 tpd and 312 tpd of hydrogen respectively.

APA
Australia's energy infrastructure partner

Wesfarmers Chemicals, Energy & Fertilisers

Background

- APA Group (APA) and Wesfarmers Chemicals, Energy & Fertilisers (WesCEF) partnered to study the PGH2 project which will produce large-scale green hydrogen south of Perth in Western Australia
- The Feasibility study was completed in 2024 with support from ARENA via the Advancing Renewables Program

Location

- Hydrogen produced circa 80 kms south of Perth
- Compressed hydrogen will be transported via the repurposed Parmelia Gas Pipeline to the Kwinana Industrial Area

Hydrogen use

- Displace the use of natural gas as feedstock for hydrogen and as a fuel source for heat in WesCEF's CSBP ammonia plant, enabling decarbonisation of a hard-to-abate industry
- Further potential to support decarbonisation of other industrial facilities in the Kwinana Industrial Area

Technical

- Phased expansion starting at 71.2 tonnes per day (tpd) of hydrogen; expanding initially to 143.5 tpd (expansion case) and subsequently to 312 tpd (large case)
- Hydrogen production facility (HPF) will operate continuously to provide a constant supply of hydrogen as is necessary for Ammonia production

Commercial

- Estimated capex for the base case is $973 million, increasing to $1,715 million for the expansion case and $3,614 million for the large case
- Levelised cost of hydrogen (LCOH) ranges from $8.00/kg to $12.30/kg, and is heavily influenced by the HPF capex and the delivered cost of renewable electricity

Enablers

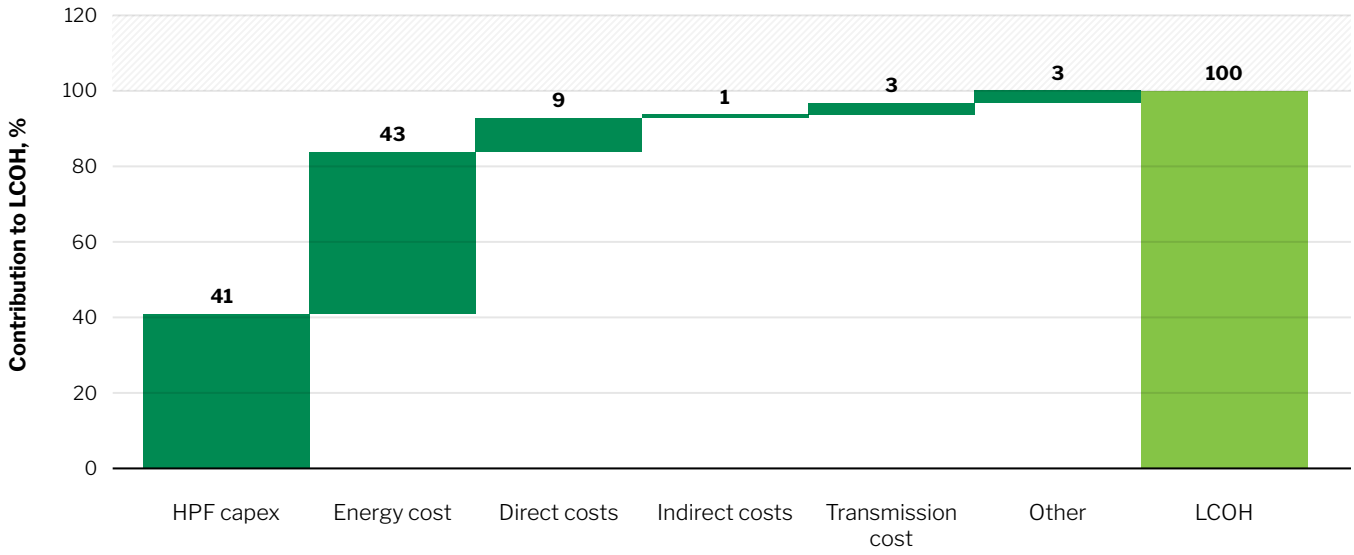
- Support to close the gap between the costs of domestic, green hydrogen production and the price that consumers can pay while remaining competitive
- Access to low cost, firmed renewable electricity supply
- An electrical transmission network capable of efficiently connecting large renewable electricity generators with large electrical loads like the PGH2 Hydrogen Production Facility

Key technical and commercial outcomes

	Base case	Intermediate case	Large case
H_2 production (tpd)	71.2	143.5	312
Nominal electrolyser capacity (MWe)	200	400	900
Req'd wind + solar capacity (MW) – excluding grid firming	392	784	1765
HPF annual electricity consumption (GWh p.a.)	1,625	3,180	6,980
Elec. consumption as % of the SWIS (21.6 TWh in 2024[1])	8%	15%	32%
Capex (A$m, 2022 terms)	973	1,715	3,614
Opex (A$m p.a., 2022 terms, $108/MWh ave. electricity price)	216	411	888
Emissions abatement potential (tonnes CO_2e p.a.)	250,000	500,000	1,100,000
Levelised cost of hydrogen (A$/kg H_2)	11	10	9.8

Notes: *1 –SWIS capacity is expected to increase to service growing electricity demand*

The figure below illustrates how each major cost driver feeds into the LCOH for the base case scenario. HPF capex and energy costs (opex) are the most significant factors affecting levelised cost.



Partners

APA Group is a leading energy infrastructure business. As Australia's energy infrastructure partner, APA owns and/or manages and operates a diverse portfolio of gas, electricity, solar and wind assets.

WesCEF is a division of Wesfarmers, comprising nine industrial businesses that operate in domestic, national and international markets. WesCEF produces and distributes essential products for the mining, agricultural, construction and manufacturing industries as well as energy for households.

For further information on the PGH2 Feasibility Study, please see the Knowledge Sharing Report available on ARENA's website at ***https://arena.gov.au/knowledge-bank/parmelia-green-hydrogen-project-feasibility-study-summary-report/***