



Compatibility of Hydrogen Blends with Type B Appliances

A HyP MV Case Study

Consult
Engineer
Deliver

Ideas
Realised



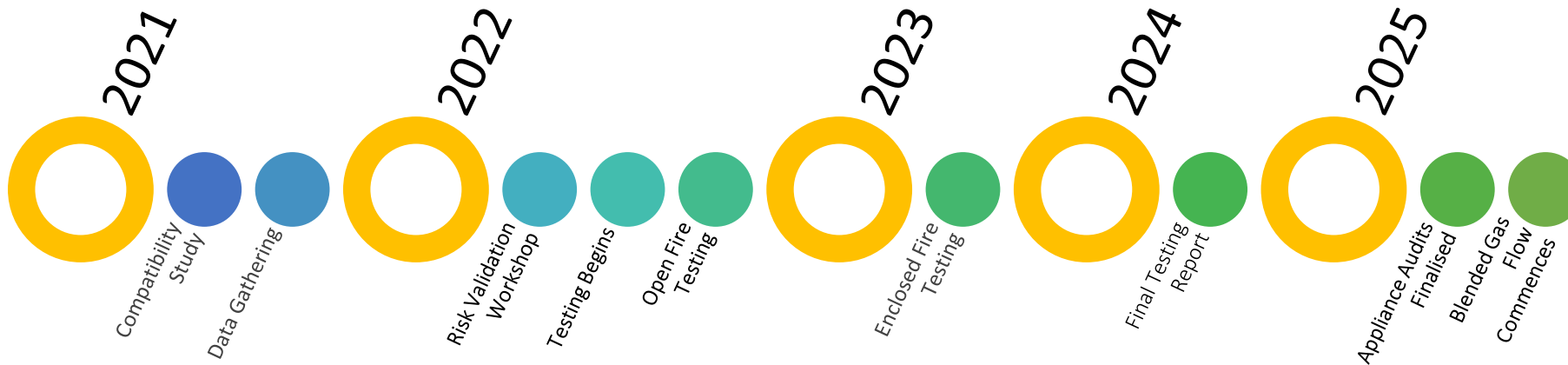
Acknowledgement of Country

We acknowledge the Kurna people as the Traditional Owners of the lands on which we meet today and pay our respects to their Elders past and present.

We also recognise the Wiradjuri people as the custodians of the Murray River area, where the HyP MV project is located, and their continuing connection to the land, water, and community of the Murray River.

Silk painting artwork created by GPA Engineering staff with Tjimari Sanderson-Milera from Kumarninithi Cultural Education

“It’s not the destination, It’s the journey”



Achievements



A complete register of Commercial and Industrial Appliances in the Albury Wodonga Region



Cross industry collaboration – all of the experts in the room!



Looking beyond the residents, engaged with over 300 business who use gas commercially and industrially



Planned and provided advice for the test programs through the FFCRC



Confidence to safely and reliably deliver renewable hydrogen to start decarbonising the Albury-Wodonga gas network



What do we know?

Type B Appliances

Anything with a gas consumption rate that exceeds 10MJ/h

- › Appliance populations are diverse.
- › Must be signed off by a Type B certifier.
- › Resilient and long-lasting investments.
- › Burners are central to how they operate.
- › The appliances are usually central to the owner's business function.

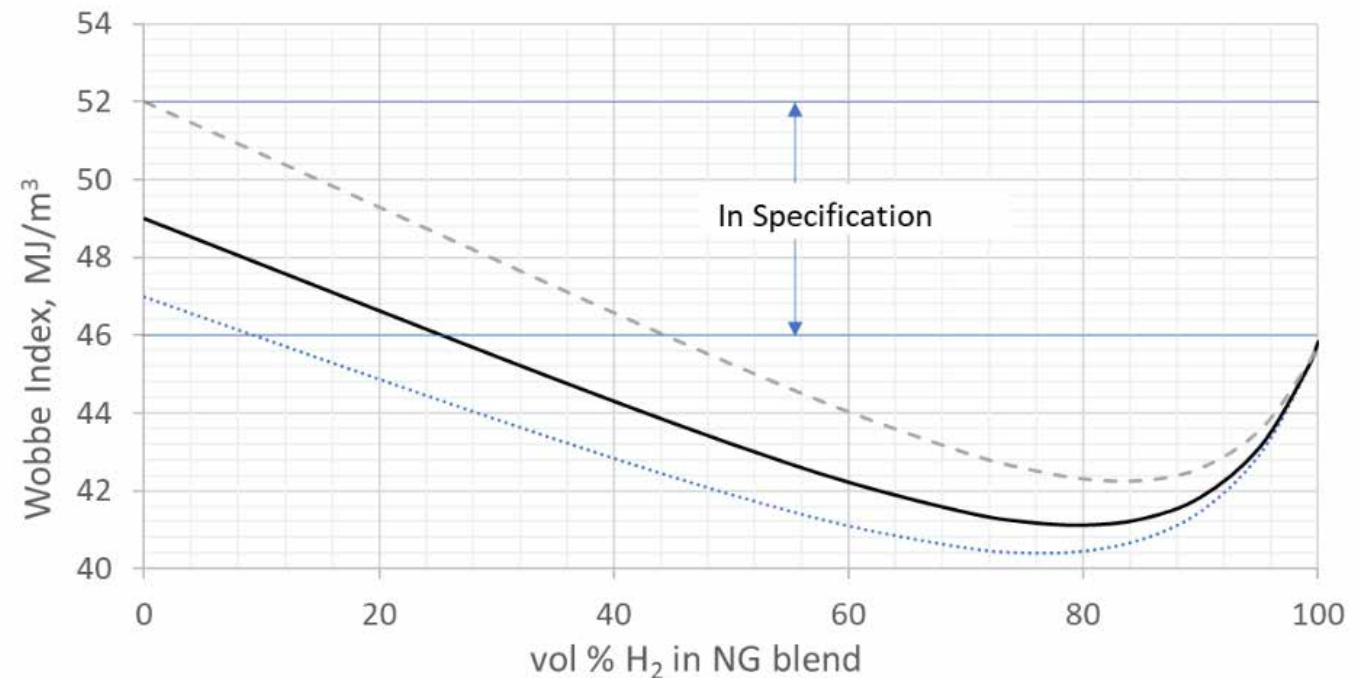


What do we know?

The Combustion Properties

Is 10% H₂ different? (from literature)

- › ~ a 2% reduction in Wobbe Index
- › ~ 6-8% reduction in HHV
- › ~3% increase in moisture content of exhaust gases
- › ~1% increase in flame temperature
- › ~50% increase in flame speed
- › Requires less air for combustion



What did we need to find? Impact to customers

Over 300 commercial and industrial customers

No existing data!

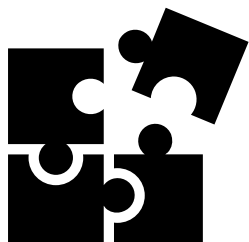
What types of appliances are in use?

What condition are they in?

What concerns do customers have?



In 2021 (Pre-FID), What were we worried about?



- › Safe Operation (e.g. Light Back).
- › Materials Related (e.g. Embrittlement).
- › Appliance Efficiency & Operation at Maximum Capacity Heating (e.g. Flame temperature)
- › Emissions Increases (e.g. NO_x, CO, Combustion Performance & Air Fuel ratio adjustments)
- › User Interface (e.g. Odorant)
- › Final Product Quality (e.g. Brick making kilns).

All the right people in the room

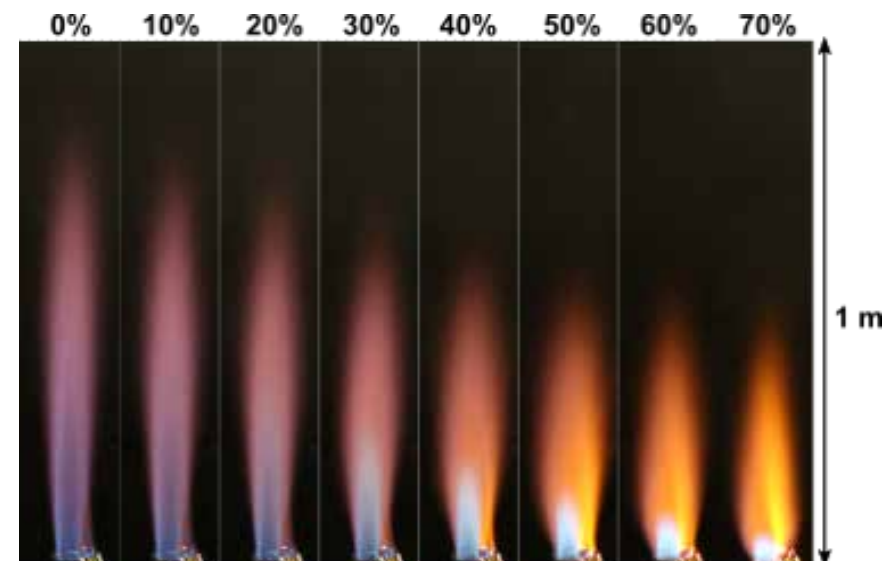
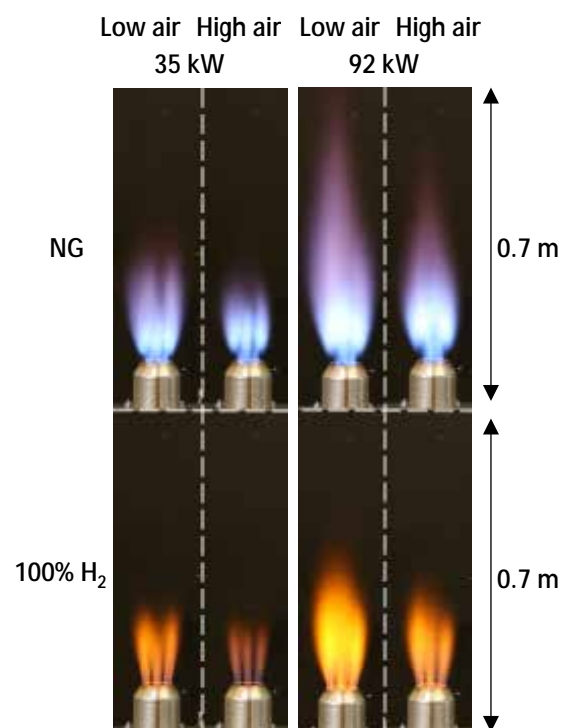
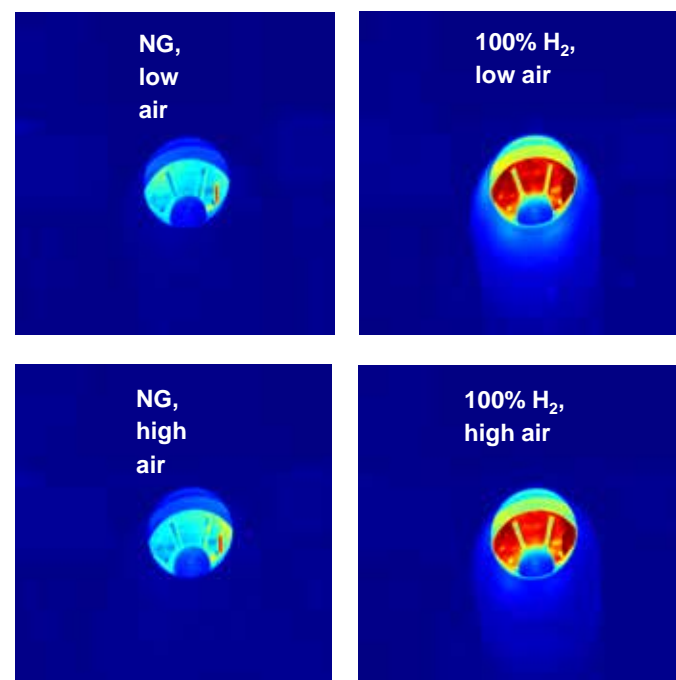
- › Burner experts
- › Gas Fitter/ Certifier(s) with Albury Wodonga Network experience
- › Researcher(s) from FFCRC
- › Project Representative(s)
- › Appliance Owners (for selected appliances only)

GPA

H.P. Murray Valley Hydrogen Project
Risk Register
Node 1 - Specific Appliance Class Impact Assessment
(Note: GPA Report 2020111907-001 and further discussion references contained therein)

ITEM NO.	SUBWORD	PROBLEM DESCRIPTION	EXISTING CONTROLS OR MITIGATION	Initial Risk Rating										Residual Risk Rating										ACTION REQUIRED	ACTION
				Development										Operational											
				APPLIANCE DESCRIPTION / CAUSE				ADDITIONAL CONTROLS ON MEASURES PROPOSED												Residual Risk Rating					

2022 – 2024 – Testing!



What are we comfortable with?

- › We can do 10% safely, and potentially up to 20%.
- › Customers are comfortable because of high quality engagement.
- › Data from HyP SA is confirming safe operation of appliances.
- › Process has been applied across other Australian jurisdictions.



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