



WORKING GROUP 3 – MEETING 6 JULY

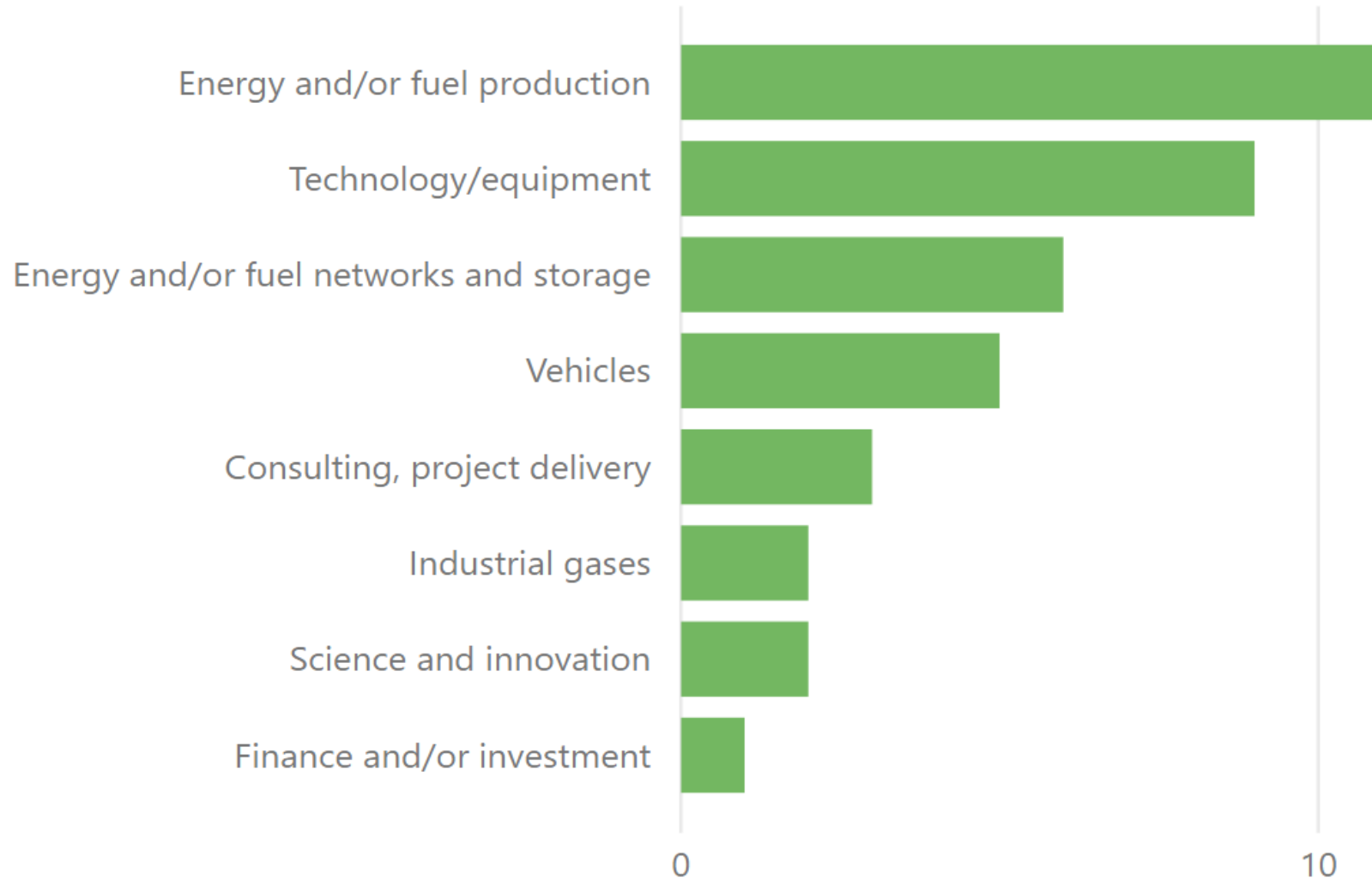
AUSTRALIAN HYDROGEN COUNCIL

JULY 2021

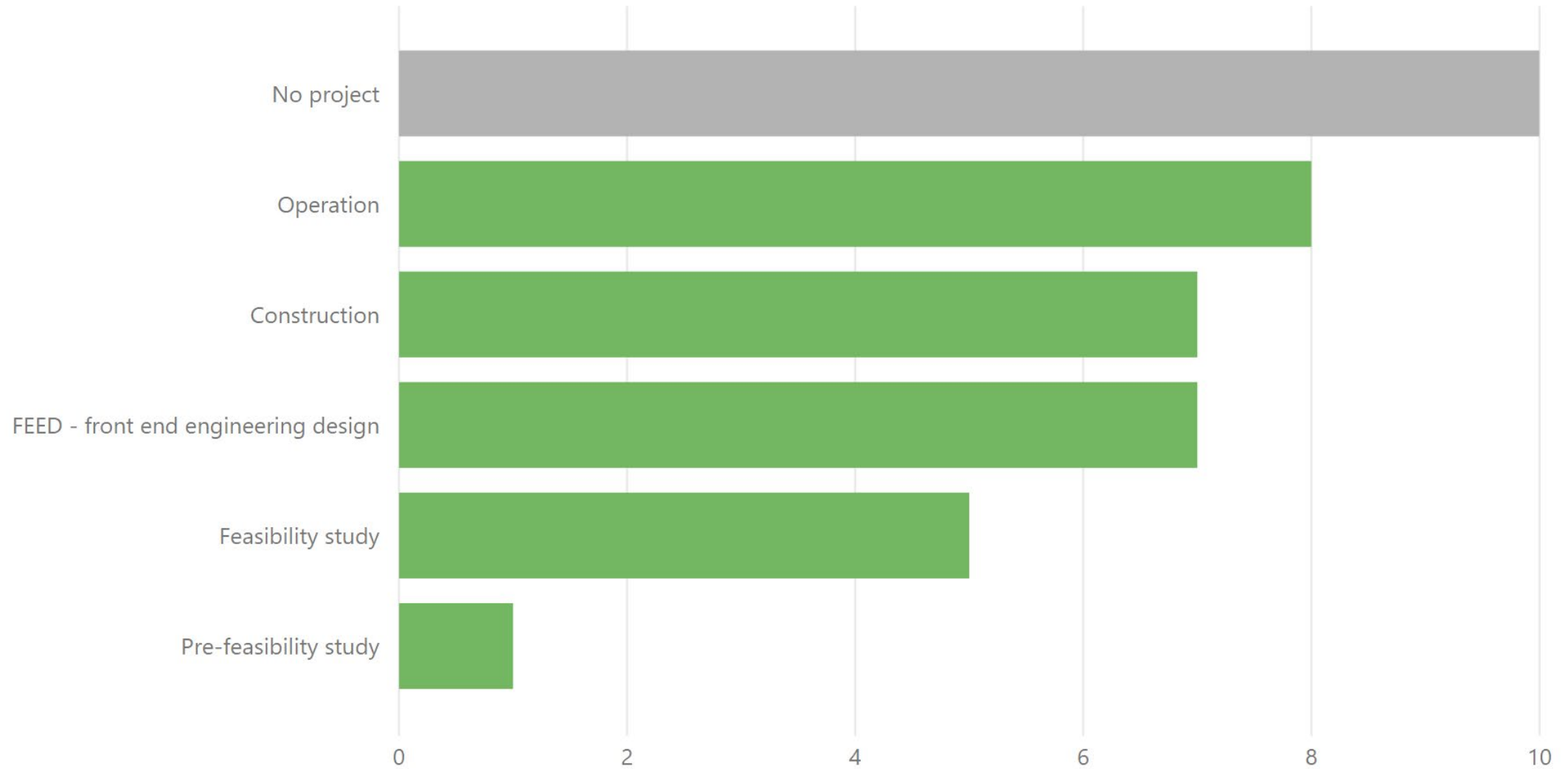
UPDATES FOR TODAY

- Undertaking: principles and guidance note
- AHC survey
- Public comms
- FFCRC update

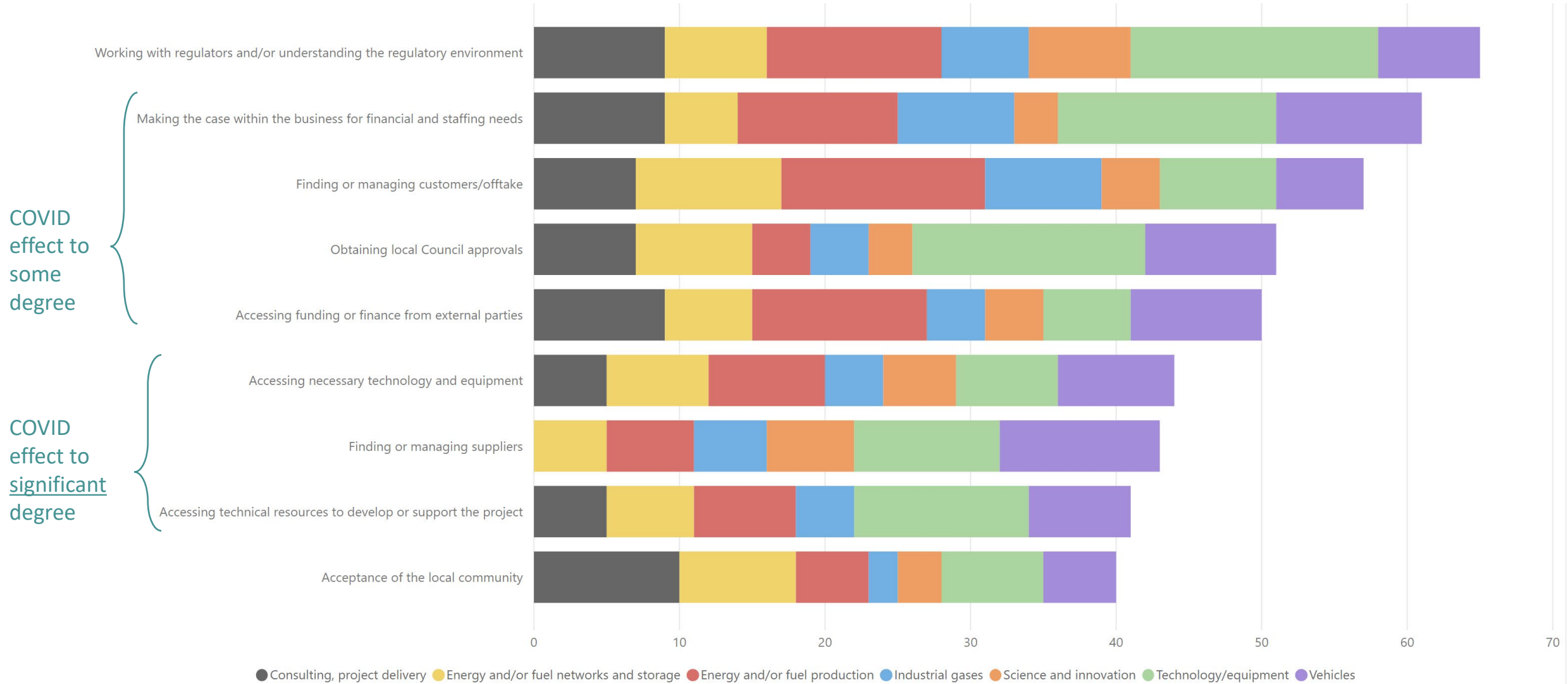
COMPANIES WHO COMPLETED THE SURVEY



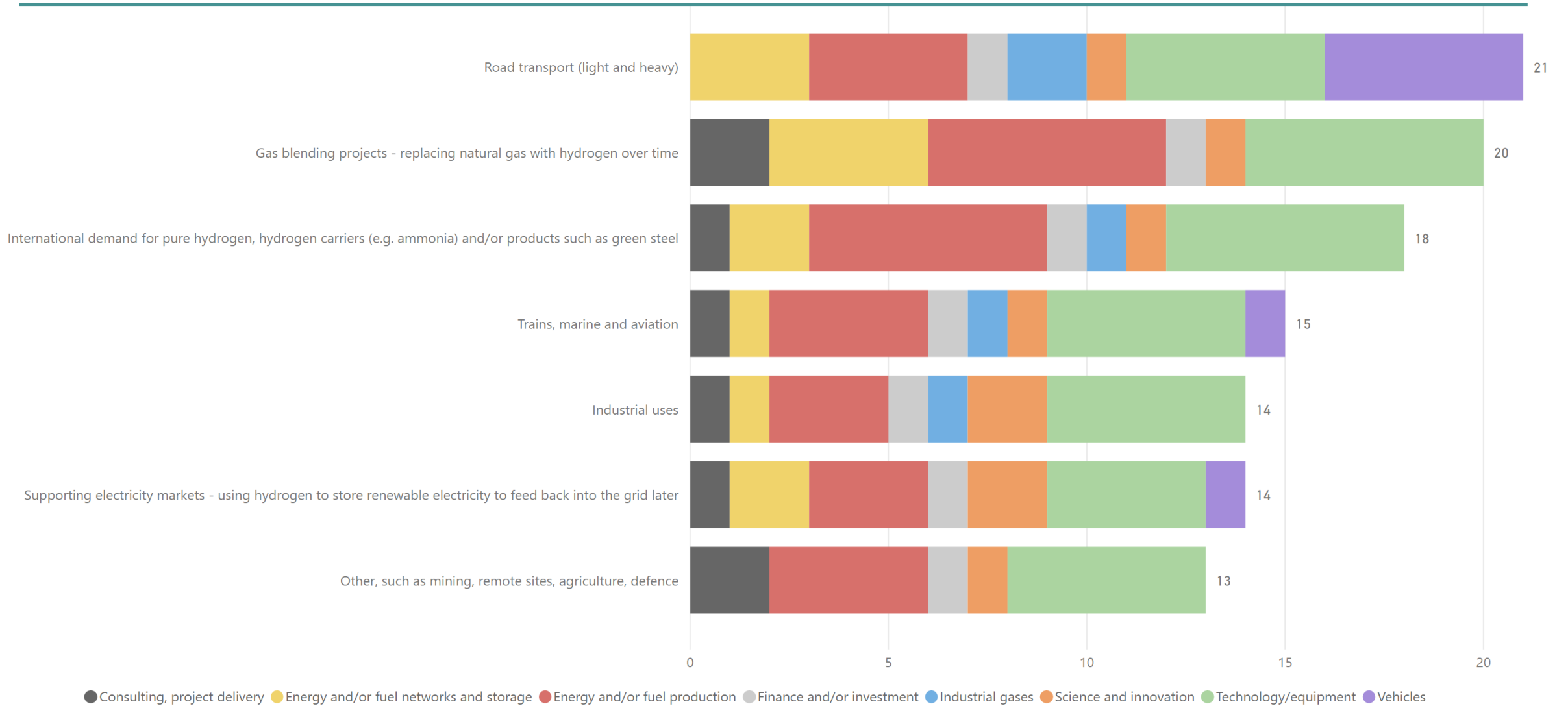
COMPANIES WITH PROJECTS



COMPANIES WITH PROJECTS – DIFFICULTIES TO DATE



HYDROGEN AMBITIONS OF ALL RESPONDENTS



SHORT TO MEDIUM TERM CONCERNS



PUBLIC COMMS ON HYDROGEN

Why?

- Government change management for energy transition/hydrogen developments
- Industry SLO risk management
- And strategically we can use social momentum to draw through government engagement – see also value of public demonstration

Who is the audience?

- Many audiences
- Priority depends on:
 - market/topic and its maturity
 - risk assessment

When?

- As above re maturity and also risk assessment
- Also a matter of understanding levels of information at different times

Risk management

	Risks	Benefits
Doing comms now/soon	<ul style="list-style-type: none"> • Have interest/need industry can't meet 	<ul style="list-style-type: none"> • Build momentum for industry with govts
Not doing	<ul style="list-style-type: none"> • Vacuum filled with undesirable messages 	<ul style="list-style-type: none"> • Don't have risk of unmet need

Good to know information is minimum to cover 'knowing means supporting'



Suggested criteria for **need to know** information:

- Hydrogen/project touches people's lives
- Out in the community
- Individual chooses to consume
- Perception of effects and risks
- Perception of opportunities won or lost

HYDROGEN STAKEHOLDERS AND PROPOSED APPROACH

	Group 1: Users of land and natural resources	Group 2: Workforce and required holders of skills	Group 3: Active consumers	Group 4: Passive consumers	Group 5: Influencers	Group 6: Owners of outcomes
People	<p>1. Users of land, water and air who will want to know about how the industry will affect them, e.g. communities, councils, local businesses, farmers, tourism operators, tourists.</p>	<p>2a. Future direct and indirect employees of the industry, e.g. engineers, technicians, mechanics, gas fitters.</p> <p>2b. People supporting social services, e.g. emergency services.</p>	<p>3. People choosing to buy hydrogen or related products via:</p> <ul style="list-style-type: none"> - fuel markets - vehicle and equipment markets, e.g. car, bus, truck, fleet, tractor, stationary fuel cell and appliances - service markets, e.g. FCEV maintenance via mechanic. 	<p>4a. People who don't choose to buy hydrogen but still use it, e.g. natural gas users receiving blended gas.</p> <p>4b. People who may choose in the future (become Group 3) when the market evolves, e.g. future FCEV purchasers.</p>	<p>5. People engaging on reputation by:</p> <ul style="list-style-type: none"> - observing and commenting, e.g. environmental activists, media - making connections, e.g. industry associations - advocating and sharing information, e.g. various comms people, local leaders. 	<p>6. People creating the markets/seen to own the outcomes, e.g. governments, councils, regulators.</p>
Issues to cover (in addition to 'Why hydrogen?' and other basics)	<ul style="list-style-type: none"> • Community safety • Renewables credentials • Land access and permit processes, and coexistence with other land uses • Water access, management, quality and permit processes • Air quality • Project consultation and community engagement through project lifecycle • Broader community economic benefits/issues 	<ul style="list-style-type: none"> • Employee safety • Workforce opportunities and training • Associated skills, contracts and services required • Renewables credentials • Emergency services requirements 	<ul style="list-style-type: none"> • Consumer safety • Renewables credentials • Available models of vehicles and equipment • Available services • Available refuelling/access to hydrogen • How hydrogen fuel and equipment compares to alternatives on key factors, including lifecycle costs • Energy security/independence (local and regional/national) 	<ul style="list-style-type: none"> • Consumer safety • Renewables credentials • Where to find information • What future changes to expect • Implications for costs 	<ul style="list-style-type: none"> • Where to find information • Safety • Renewables credentials • What future changes to expect 	<ul style="list-style-type: none"> • Broader community economic benefits/issues • Workforce opportunities and training • What needs to happen • Where to find information
Space and time	<p>Now.</p> <p>Both local hubs/towns and spokes to connect hubs.</p>	<p>Now for emergency services. Longer term local hubs/towns and spokes to connect hubs, except for where covered under Group 1.</p>	<p>Now for relevant catchment applications (e.g. hubs with vehicles in Group 1) but ultimately not location-specific.</p> <p>Timing for everything else needs to be in market-specific 'Goldilocks zone'.</p>	<p>Now in areas already rolling out blending (managed by industry).</p>	<p>Start now with local leaders (connect with emergency services under Group 2) for positive influence and move outwards from there.</p> <p>Now for industry associations and respond to media.</p>	<p>Now to targeted groups, including councils, government departments and Parliamentary Friends of Hydrogen.</p>

HYDROGEN STAKEHOLDERS AND PROPOSED APPROACH

	Group 1: Users of land and natural resources	Group 2: Workforce and required holders of skills	Group 3: Active consumers	Group 4: Passive consumers	Group 5: Influencers	Group 6: Owners of outcomes
Next steps	<ul style="list-style-type: none"> Take undertaking to councils: <ol style="list-style-type: none"> Identify which projects with project managers, state govts and cluster managers Complete draft undertaking Complete basic information to support and supplement <ul style="list-style-type: none"> fact sheets FAQs Use the opportunity to ask what they need from us. Engage with project managers on current issues and comms. 	<ul style="list-style-type: none"> Engage with SA Govt and DISER on emergency services discussions. Engage with CHS on safety forum. Continue to work with SA Govt on broader skills and workforce issues and QLD Govt on Ministerial Energy Council. 	<ul style="list-style-type: none"> Develop view of 'Goldilocks zone' per key market to use for comms planning: <ol style="list-style-type: none"> Map likely market availability and relative lifecycle cost for key vehicles and equipment Overlay analysis of likely triggers for consumer uptake and time to consider Overlay risk assessment for: <ul style="list-style-type: none"> market not having developed in time for consumer willingness to buy (comms too soon scenario) alternative voices/products filling the space (comms too late scenario). 	<ul style="list-style-type: none"> Liaise with gas networks and associations to build library of past and planned community engagement. 	<ul style="list-style-type: none"> Engage industry associations here and overseas on experiences to date and use this in conjunction with other steps to build a clearer picture of needs. Continue to respond to requests from media and various stakeholders. 	<ul style="list-style-type: none"> Set up Parliamentary Friends of Hydrogen Council outreach once have outcomes from Group 1 steps and clarity on Groups 3 and 4. Usual engagement with governments. Overlap with WG8 for regulators.
Timing	<p>Over July-September 2021 discuss with ideally four councils from four different states.</p> <p>Draft and complete fact sheets and FAQs update by end August 2021.</p>	<p>July 2021 - ongoing</p>	<p>Preliminary discussions and analysis: July-August 2021.</p> <p>Decision on whether to go into more depth by end August 2021.</p>	<p>July-August 2021 speak with:</p> <ul style="list-style-type: none"> AGIG Jemena ATCO APA ENA APGA <p>Have full complement and initial assessment by end August 2021.</p>	<p>July-August 2021 for industry associations, and start with:</p> <ul style="list-style-type: none"> CEC ENA APGA Bioenergy Australia State government connections 	<p>Establish Parliamentary Friends of Hydrogen by end August 2021.</p>



SLO Update: National Survey & Citizens' Panels

Professor Peta Ashworth OAM ; The University of Queensland

Acknowledgements

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National Survey Results

Initial Research Questions

Based on literature and previous research by the team

What are the factors that influence support for hydrogen?

Do individuals respond differently to export versus a domestic industry?

Does providing factual information to survey respondents lead to greater support?

Do different message frames influence support for hydrogen?

Will existing gas users show a stronger preference towards gas and hydrogen?

Message frames

Message 1: Environmental message (transition)

Reducing carbon emissions from the gas network by blending in 5-10% renewable gases (like hydrogen) is an important first step towards Australia's future energy mix.

Message 2: Economic message (national)

Hydrogen will provide important economic benefits to Australia through export revenue, new industries, and jobs.

Message 3: Environmental message (100% renewable energy)

Australia can use its abundant renewable energy resources to produce hydrogen, which will give us 100% emissions-free "green" energy.

Message 4: Economic message (household)

The government is partnering with industry to develop tangible solutions to make hydrogen energy affordable for Australian households.

Basic demographics

29th January and 20th February 2021: 3020 Total

GENDER

Male	1463 (48.4%)
Female	1543 (51.2%)
Other	14 (0.4%)

AGE

18 – 34 years	899 (29.8%)
35 – 54 years	1026 (34.0%)
55+ years	1095 (36.3%)

STATE/TERRITORY	Frequency	Percent
NSW	947	31.4
VIC	755	25.0
QLD	594	19.7
SA	254	8.4
WA	310	10.3
TAS	71	2.4
NT	32	1.1
ACT	57	1.9

When you hear the word hydrogen what are the first things that come to mind?

Category	Example responses	n	%
Chemical/chemistry	a chemical; atom and elements; first element on the periodic table; science;	1373	45.5
Energy/power/fuel(s)	a fuel; a source of energy; alternative power source	660	21.9
Water	water; part of water; emits water	627	20.8
Bomb/nuclear weapon	bomb; nuclear weapon; Hiroshima	281	9.3
Hydrogen properties	flammable gas; lighter than air; explosive	180	6.0
Nothing/none/don't know	don't know; I am not sure; I have no idea	152	5.0
Air/atmosphere	fresh air; part of the air we breathe; a compound in our atmosphere	102	3.4
Balloons	balloons; gas used to blow up balloons; hot air balloons	63	2.1
	Hindenburg disaster; blimp; used in early		

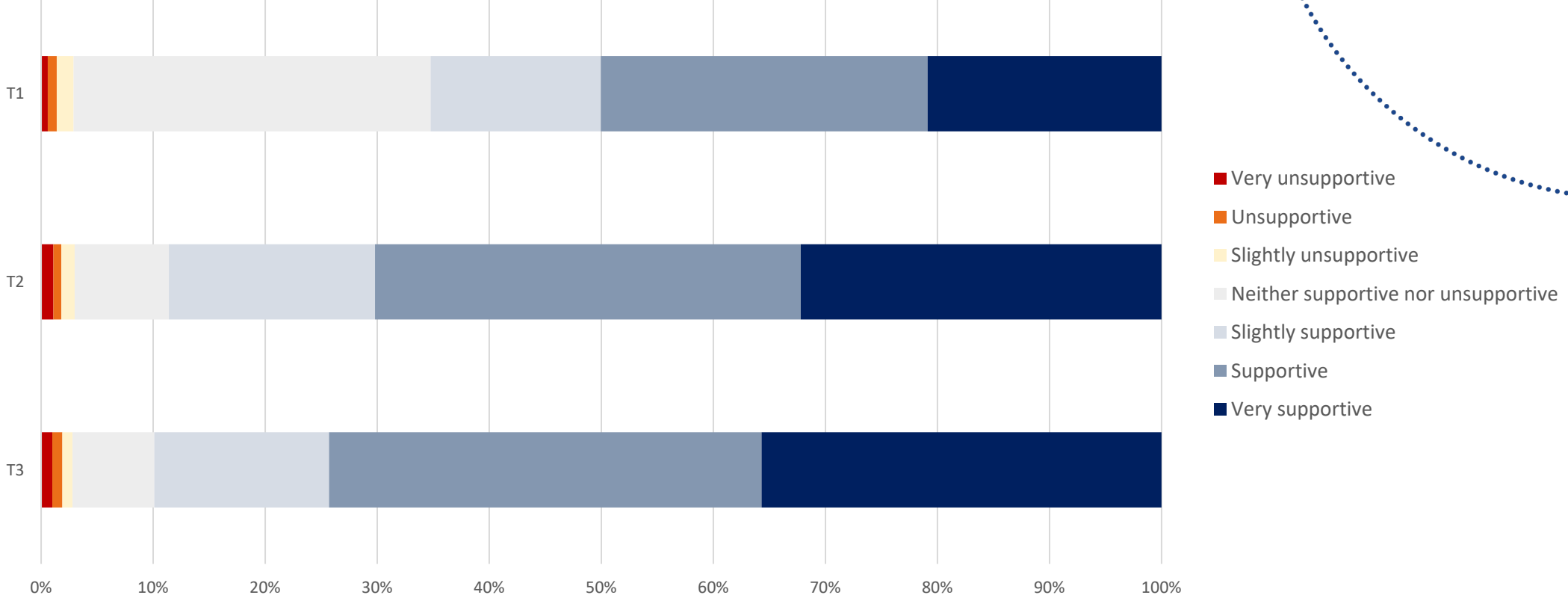
There has been discussion about using hydrogen in Australia recently

Please respond to the following statements.	Yes		No		Unsure	
	n	%	n	%	n	%
I have heard about a project blending natural gas and hydrogen for domestic use	628	20.8	2007	66.5	385	12.7
I have heard about a hydrogen production project in Australia	817	27.1	1808	59.9	395	13.1
I have heard about hydrogen in the media	1171	38.8	1528	50.6	321	10.6
I have heard about the National Hydrogen Strategy	443	14.7	2202	72.9	375	12.4

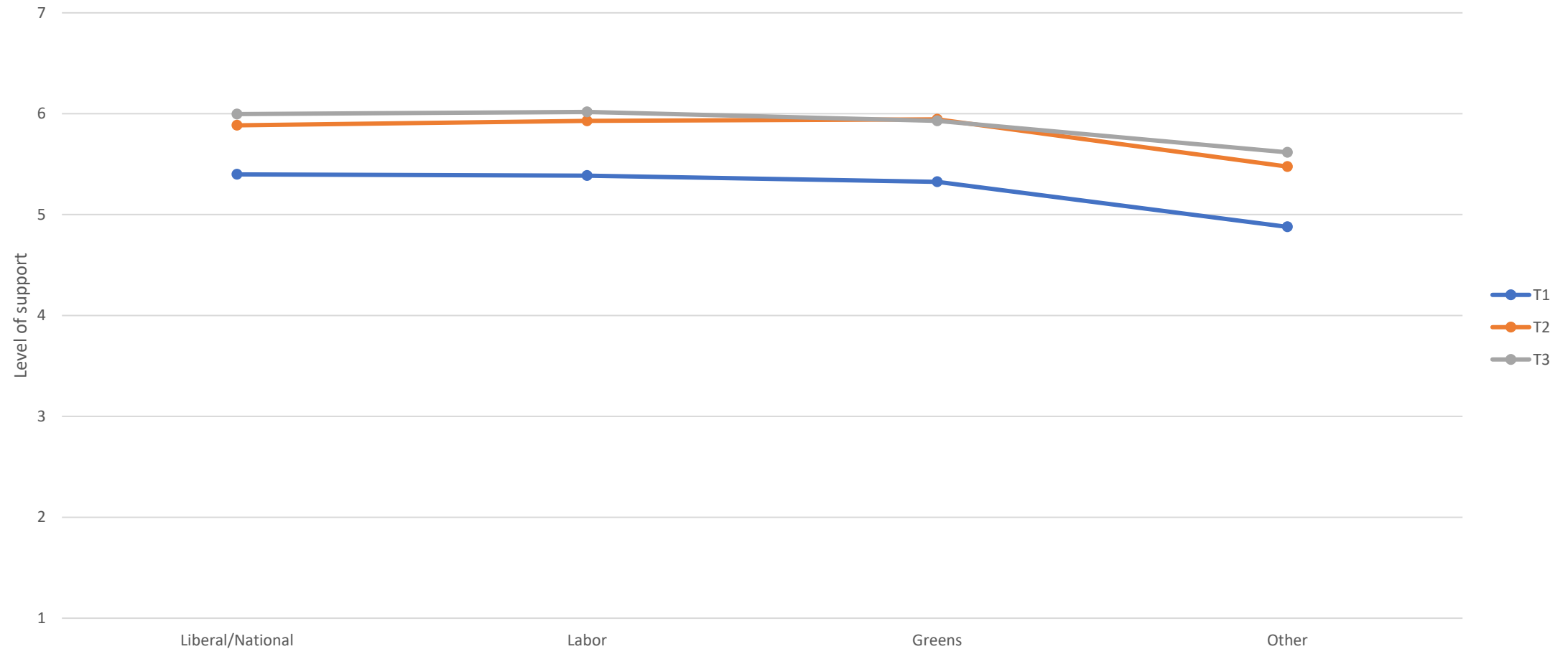
More people in Tasmania (51.0% more than expected), Northern Territory (26.4%), New South Wales (9.7%), South Australia (9.2%), and the Australian Capital Territory (3.9%) had heard about a hydrogen project in Australia.



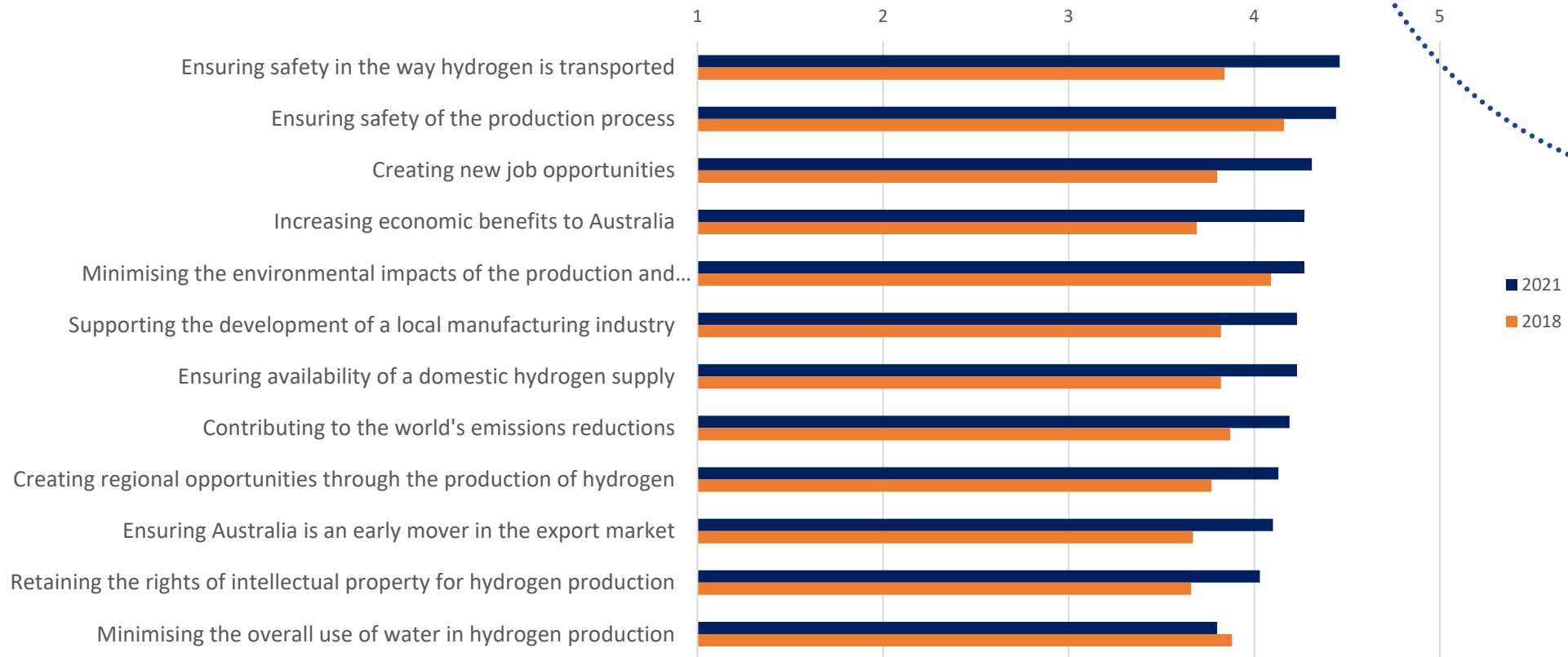
Overall, how do you feel about hydrogen as a possible solution for energy and environmental challenges?



Level of support for hydrogen by political party preference?



If Australia was to start exporting H₂ how important are the following to you?



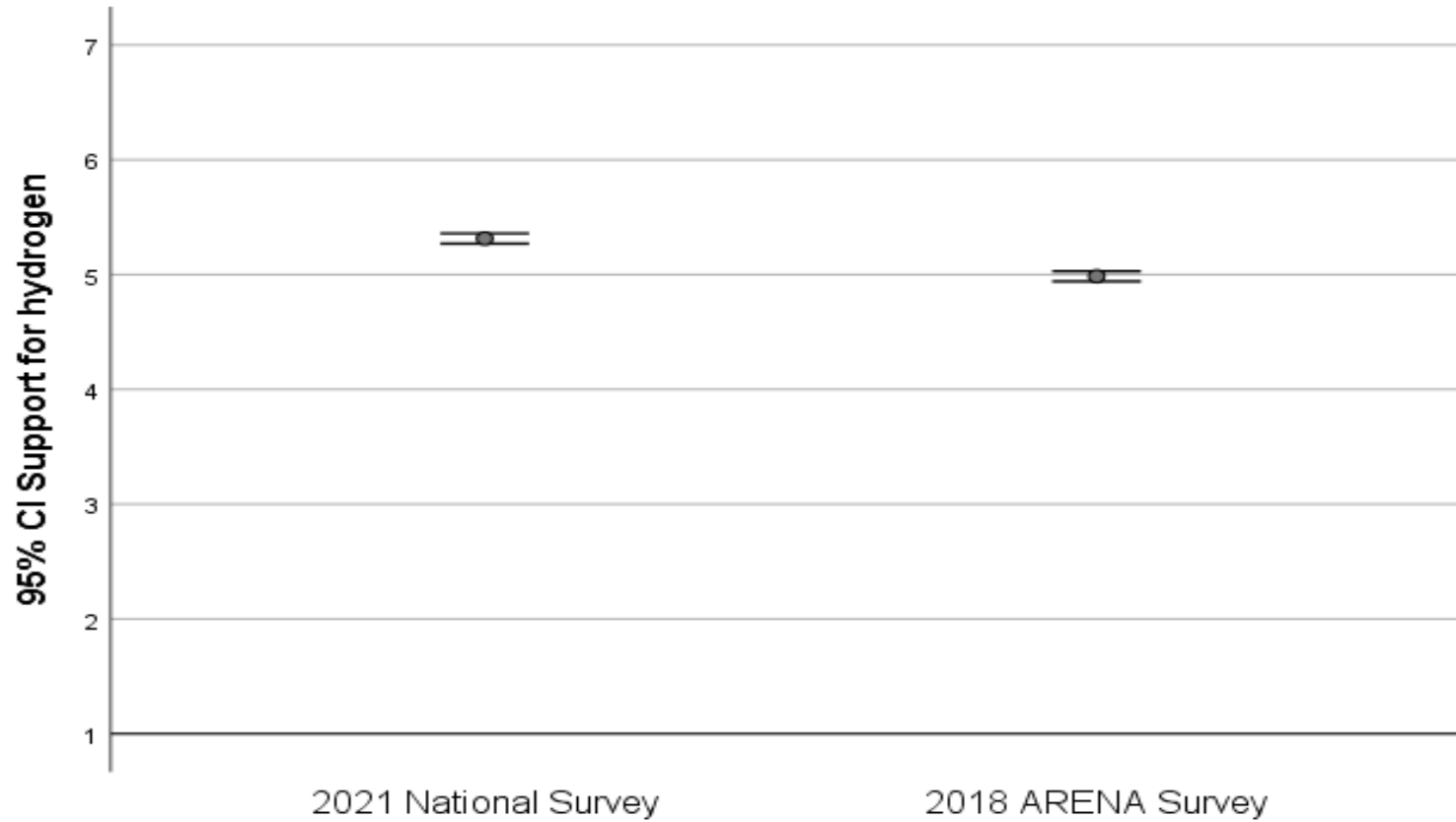
^aMeasured on a 5-point scale where 1 = not at all important, 5 = extremely important; *n* = 1,513.

How important are the following factors in determining your willingness to use H₂ in your home?

	2021	2018
Safety	4.50	4.42*
Reliability of energy supply	4.27	
Health benefits (no carbon monoxide emissions)	4.21	4.17
The cost of hydrogen to fuel your home	4.18	3.88**
Odour for detecting leaks	4.08	4.04
The cost to modify appliances	4.02	3.67**
No greenhouse gas emissions	3.98	3.89*
Proven demonstration projects	3.94	3.89
The level of inconvenience to change over from current systems and appliances	3.64	3.34**
Being able to choose between gas or electricity for cooking	3.56	3.67*
Flame colour/visibility	3.42	3.53*

Measured on a 5-point scale where 1 = not at all important, 5 = extremely important; n = 1,507 *p < .05, **p < .01

Comparison of support for hydrogen between 2021 and 2018.



2021

$M = 5.31, SD = 1.25$

2018

$M = 4.99, SD = 1.20$

Draft Conclusions

1. Safety is the number one priority for Australians to ensure the development of a successful hydrogen industry and will require adequate regulations are in place provide confidence.
2. Australians are positive toward the economic opportunities it might bring such as jobs and benefits for regional communities.
3. Provision of factual information during the survey, did help to strengthen support for those who had previously expressed no opinion, however it did not influence those who were strongly opposed.
4. Green hydrogen continues to be the preferred generation source compared with any using CCS.
5. On the whole there is multi-partisan support for hydrogen which is helpful when considering the industry's development.
6. While gas users expressed a stronger support for continued use of gas and transition to hydrogen, the difference was minimal. This will be an important issue to monitor as the continued discussion between all electric and gas transpires.

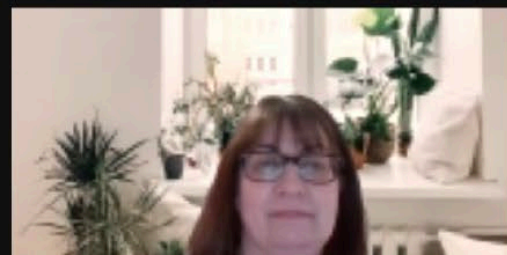
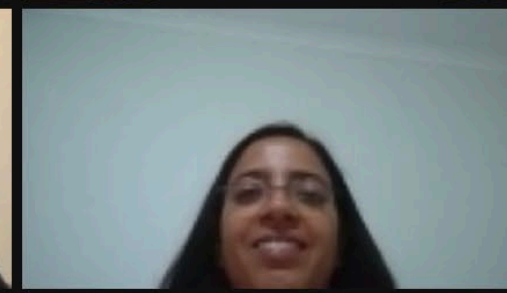
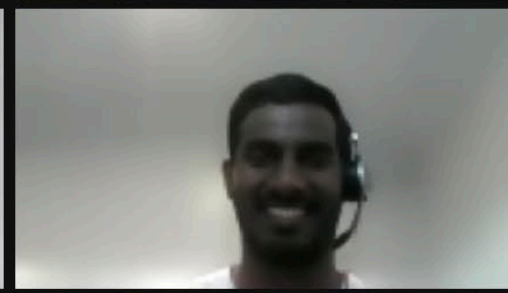
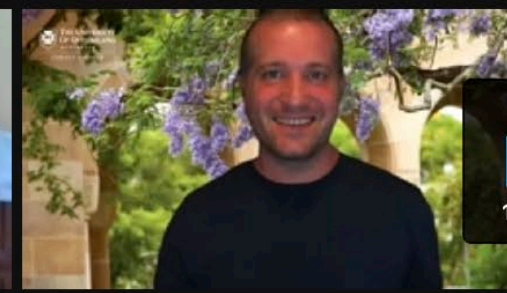
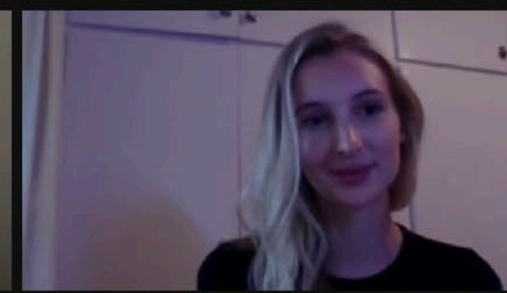


Citizens' Panels

A quick overview



Belinda Wade (Researcher)



Project Aims

To explore public perceptions and views around the role of future fuels in the future energy mix of Australia by outlining:

- opportunities and challenges for the implementation of future fuels in the future energy mix as well as
- considerations and trade-offs that policy makers, industry and citizens, need to make to enable decarbonisation of the Australian energy mix.

Geographic locations:

- **Greater Melbourne** - metropolitan area, heavily dependent on gas for domestic use
- **Illawarra/Wollongong Region** - a regional area with proposed port facilities for hydrogen export
- **South Australia** - to represent a mixed state-based sample characterised by large investment and use of renewable energy.

Week 1

Learning Session One: Climate Change and Energy

Day: Monday (Feb 22, 2021)

Participants: All location

Deliberation session: Greater Melbourne

Day: Tuesday (Feb 23, 2021)

Deliberation session: Illawarra Region/Wollongong

Day: Wednesday (Feb 24, 2021)

Deliberation session: South Australia

Day: Thursday (Feb 25, 2021)

Week 2

Learning Session Two: Future Fuels

Day: Monday (March 1, 2021)

Participants: All location

Deliberation session: Greater Melbourne

Day: Tuesday (March 2, 2021)

Deliberation session: Illawarra region/Wollongong

Day: Wednesday (March 3, 2021)

Deliberation session: South Australia

Day: Thursday (March 4, 2021)

Week 3

Learning Session Three: Low-carbon energy pathways

Day: Monday (March 15, 2021)

Participants: All locations

Deliberative session: Greater Melbourne

Day: Tuesday (March 16, 2021)

Deliberative session: Illawarra region/Wollongong

Day: Wednesday (March 17, 2021)

Deliberative session: South Australia

Day: Thursday (March 18, 2021)

Presentations

Learning session 1

- Climate Change, BOM
- Energy Today, UQ (**Simon**)

Learning session 2

- Hydrogen, CSIRO
- Biomass/Biogas, Uni of Adelaide (**Tara & Peter**)
- Low carbon energy transitions and consumers, QCOSS

Learning session 3

- Future fuels pathways, Frontier Economics;
- Trade-offs and challenges – energy transitions, Climate Council
- Utility scale case study - Aurecon
- Energy vulnerability – RMIT (**Niki**)

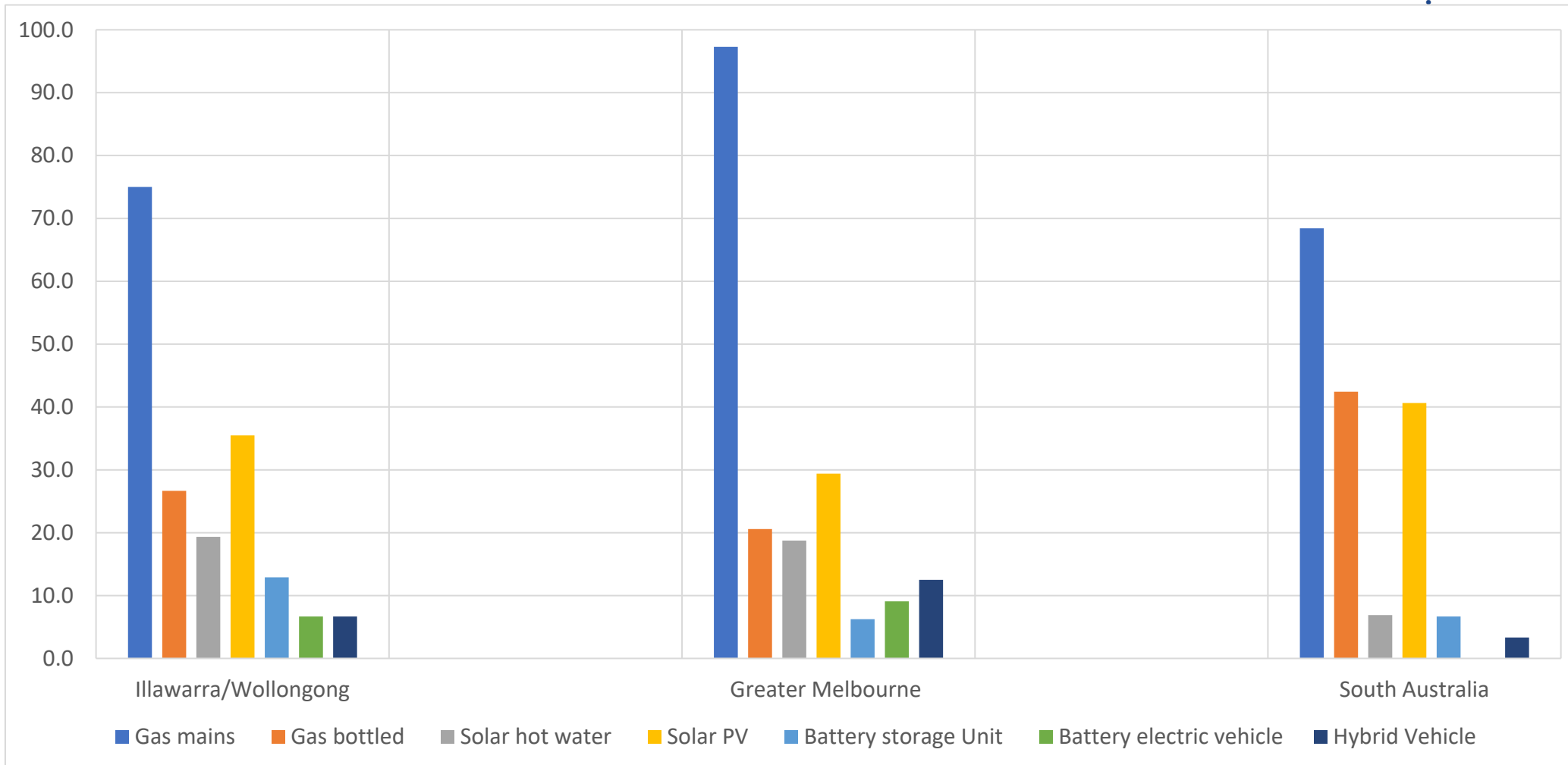


% have heard about it + know about it and could describe it to a friend:

	Illawarra/ Wollongong	NSW	Greater Melb.	VIC	South Australia	SA
How hydrogen is produced	62%	48%	66%	45%	75%	51%
The use of hydrogen fuel cells in vehicles	50%	61%	62%	61%	78%	66%
The use of hydrogen fuel cells in homes	33%	39%	38%	36%	40%	31%
Hydrogen as an energy storage medium for electricity	44%	49%	43%	46%	48%	50%
Hydrogen refuelling stations	26%	44%	43%	44%	40%	50%
Burning hydrogen as a replacement for natural gas	53%	53%	49%	51%	55%	55%

Sources of energy at home

All households had grid connected electricity in their homes



Opportunities for future fuels in our daily lives and economy more broadly

Greater Melbourne	Illawarra/Wollongong	South Australia
Cleaner sources of energy and benefits to the environment and public health	Environmental and social benefits	Clean sources of energy and benefits to the environment and public health
Low-carbon energy future and establish new principles and structures	Opportunities around production and use of new fuels/type of energy	Employment and workforce upskilling
Employment, workforce upskilling and skill transfer	Workforce training and transition to new employment	New economic and financial opportunities
	Export and economic benefits	Low-carbon future
	Transport	Transport
	Community involvement and education	Export

Challenges for future fuels in our daily lives and economy more broadly

Greater Melbourne	Illawarra/Wollongong	South Australia
Technology and infrastructure	Cost	Affordability
Cost of establishing a future fuels industry	Safety concerns	Cost and financial implications
Challenges around public perceptions, political will and policy	Employment and workforce training	Education, engagement and public opinion
Affordability and security of supply	Public perception of future fuels	Infrastructure
The process of transitioning to low-carbon energy	Affordability, reliability and access to available technology	Reliability and safety
Safety	The nature of future fuels and their generation process	Workforce training
Employment	Uptake future fuels technologies	Technology, Transport, Export, Waste
	Loss of fossil fuel revenue	

Greater Melbourne Principles

Every person has the right to safe, reliable, and affordable energy supplies that are supported by fair tariffs and rebates. Therefore, all Australians should have reliable, guaranteed energy when they need it and at a price they can afford.

The implementation of new low carbon energy technologies should be based on scientific research, education, and supported by government and industry funding.

The new energy technologies should be safe to produce, consume, and dispose of in comparison to the current technology.

Australia should participate in global efforts to reduce CO2 emissions. It should prioritise the development of renewable energy, introduce targets to approach zero net carbon emissions and a code of conduct informing Australians about all energy choices

Energy is an essential service. Big companies and government should act in the public interest, so that energy services are equitable. Energy providers should put human and environmental impacts alongside profit. Government and private support for education and research with a purpose to encourage innovative and progressive technology with an objective to produce financially viable renewable sources of safe, environmentally friendly and reliable energy.

Governments decisions should be apolitical and instil fair incentives for moving towards renewables and penalties for non-compliance. They should allow free enterprise to develop alternative energies at a cost-effective rate for the consumer, through tax

There should be an obligation to provide energy to the citizens of Australia first before exporting to other countries. The energy transition throughout the years needs to have system redundancies to ensure energy



Enabling the decarbonisation of Australia's energy networks

Questions!

Future Fuels CRC is supported through the Australian Government's Cooperative Research Centres Program. We gratefully acknowledge the cash and in-kind support from all our research, government and industry participants.



Australian Government
Department of Industry, Science,
Energy and Resources

Business
Cooperative Research
Centres Program



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