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# The Australian public's perception of hydrogen for energy - Technical Appendices



## Note

This document is an Appendix to the report *The Australian public's perception of hydrogen for energy* and should be read in conjunction with the full report prepared by:

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## A-1 Research methods

In June, 2018 ten focus groups of two and a half hours in length were conducted (refer A-1 for run sheet), in in South Australia (Adelaide - 3 and Whyalla - 2), and Victoria (Melbourne - 3 and Traralgon - 2). Following a short survey, participants were guided through a discussion around the emergent opportunities for hydrogen using of a series of short videos<sup>1,2,3</sup> and an information sheet from Hydrogen Mobility Australia. In total, 92 participants (55 female; 37 male) of mixed ages (range 20 to 76 years; mean=44) and employment status attended (refer A-3 Focus group demographics).

A national survey was then developed and implemented in September, 2018 (N=2,785). A market research company delivered the survey online to ensure a nationally representative sample as shown in **Error! Reference source not found.** (refer A-4 Survey demographics). The survey was designed to reflect the focus group discussions using a mix of questions and some limited information provision (written, video and pictorial). The survey measures were informed by the topics that arose from both the focus group discussions and previous hydrogen studies that emerged from the literature review. In addition to general knowledge, attitudinal and demographic questions the survey was divided into three streams which focused on either hydrogen for transport, for domestic use or for export (refer 0 Copy of survey). To keep the survey length to a minimum, participants were then randomly assigned to one of these streams.

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<sup>1</sup> Student energy group. <https://www.youtube.com/watch?v=Kv8WT3-7ZHE>

<sup>2</sup> CSIRO video <https://www.youtube.com/watch?v=GPW5pRHPLTk>

<sup>3</sup> <https://www.northerngasnetworks.co.uk/2016/07/12/watch-our-h21-leeds-city-gate-film/> - excerpt from 50sec – 4min 30 secs

## A-2 Focus group run sheet

Time	Item
10	<p><u>Welcome</u>            Introductions &amp; objectives            Guidelines for discussion – Chatham house etc.</p>
15	<p><u>Knowledge of hydrogen</u>            Who has heard of hydrogen?            What is the first thing that comes into your mind when you hear the term hydrogen?            What do you know about hydrogen?</p>
15	<p><u>Properties (and production?) of hydrogen</u>            Student energy video, PowerPoint or handout?  <a href="https://www.youtube.com/watch?v=Kv8WT3-7ZHE">https://www.youtube.com/watch?v=Kv8WT3-7ZHE</a>            Now that you have heard about the properties and production of hydrogen what are your initial thoughts?            How would you feel about having a hydrogen project nearby where you live?</p>
15	<p><u>Hydrogen opportunities for Australia: Part 1</u>  <i>Export</i>            CSIRO video  <a href="https://www.youtube.com/watch?v=GPW5pRHPLTk">https://www.youtube.com/watch?v=GPW5pRHPLTk</a>            Share opportunity to produce hydrogen (as above – renewable or fossil plus CCS) and bulk transport by ship (either as liquid, ammonia or any other carrier) from Australia to achieve energy cost competitiveness in Japan, Korea etc.</p>
30	<p><u>Hydrogen opportunities for Australia: Part 2</u>  <i>Domestic economy</i>            Hydrogen Mobility Australia handout.  <b>Transport sector</b> - Substitution of diesel/petrol/gas in transport applications especially buses, heavy vehicles, long haul trucking, forklifts. Either in pure form (for use in fuel cells) or (as an interim step) by further processing into methanol or other chemicals for use in conventional internal combustion engines.            What do you think would be opportunities/benefits of using this transport?            How would you feel about having such vehicles on the road?            Would you consider driving a hydrogen vehicle if given the chance?            Comparison with BEV's?  <b>Direct combustion</b> (heating spaces and other residential – existing infrastructure, well established gas network.            Injection into the gas distribution network, initially as a blend (learn from the 2, 5, 10%) with a long term objective to achieve 100% substitution.  <i>End User Hydrogen in stove top, hot water heater etc.</i>            Any thoughts about having hydrogen gas in infrastructure?            What are your thoughts around the trade-offs between using gas versus electricity?  <i>This should include facts around the change over from "towns gas" to natural gas</i>  <b>Hydrogen as feedstock</b> - Substitution of hydrogen from steam methane reforming for industrial processes, especially ammonia for fertiliser production            What do you think about the possibility of new industries with much lower emissions?            What are your thoughts about Australia's position in global decarbonisation of supply chains?</p>
15	<p><u>Hydrogen opportunities for Australia: Part 3</u>  <i>Energy system resilience</i>            Hydrogen provides an alternative energy storage capacity Electrolysis is a flexible load for variable renewable energy Hydrogen can help reduce liquid fuel reserve requirements</p>
20	<p><u>Possible Hydrogen city</u>            Briefly describe how a standalone city might work - (refer to Leeds 21 proposal)  <a href="https://www.youtube.com/watch?v=baBmoaNujKk">https://www.youtube.com/watch?v=baBmoaNujKk</a>            Would you choose to live there?</p>

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	<p>How would you feel about living in an all hydrogen/electricity house? Do you have a preference for electricity or gas? What do you think will be needed to achieve this?</p>
20	<p><u>Show case of Australian early mover examples? Role of government and industry? (Both?)</u> Possibly show a couple of examples of what is being undertaken - implemented or planned. Expected timeframes. What do you believe the role for government (federal and state) is in establishing a hydrogen economy? What do you believe should be the role of industry? -</p>
10	<p>Closing statement, thank you and gift voucher Is there anything final comment you would like to make about what we have covered today to the HSG, COAG who may be considering this opportunity? Thanks, follow up and expected feedback to participants. Hand out vouchers</p>

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## A-3 Focus group demographics

Focus Group	Location	Age Range	Actual Age Range	Female	Male	Total
1	Adelaide, SA	56+	56-72	4	4	8
2	Adelaide, SA	34-54	35-53	6	4	10
3	Adelaide, SA	18-34	21-33	6	5	11
4	Whyalla, SA	45+	50-76	7	3	10
5	Whyalla, SA	18-45	29-47	5	1	6
6	Melbourne, VIC	56+	60-74	4	6	10
7	Melbourne, VIC	34-54	35-44	5	4	9
8	Melbourne, VIC	18-34	20-33	8	2	10
9	Traralgon, VIC	45+	47-76	5	4	9
10	Traralgon, VIC	18-45	20-45	5	4	9
<b>TOTAL</b>			<b>20-76</b>	<b>55</b>	<b>37</b>	<b>92</b>

## A-4 Survey demographics

Demographic	Category	Stream A: Transport	Stream B: Domestic Use	Stream C: Export	Total
Gender	Male	463	435	487	1385
		48.8%	47.2%	53.2%	49.7%
	Female	482	484	427	1393
		50.8%	52.6%	46.6%	50.0%
	Other	3	2	2	7
		0.3%	0.2%	0.2%	0.3%
	<b>TOTAL</b>	<b>948</b>	<b>921</b>	<b>916</b>	<b>2785</b>
		<b>34.0%</b>	<b>33.0%</b>	<b>33.0%</b>	<b>100.0%</b>
Age	18 to 34	274	266	232	772
		28.9%	28.9%	25.3%	27.7%
	35 to 54	333	333	356	1022
		35.1%	36.2%	38.9%	36.7%
55+	341	322	328	991	
	36.0%	35.0%	35.8%	35.6%	
Aboriginal or Torres Strait Islander origin?	No	929	896	898	2723
		98.0%	97.3%	98.0%	97.8%
	Yes, Aboriginal	17	20	17	54
		1.8%	2.2%	1.9%	1.9%
Yes, Torres Strait Islander	2	5	1	8	
	0.2%	0.5%	0.1%	0.3%	
State	New South Wales	304	280	294	878
		32.1%	30.4%	32.1%	31.5%
	Victoria	232	249	223	704
		24.5%	27.0%	24.3%	25.3%
	Queensland	185	181	191	557
		19.5%	19.7%	20.9%	20.0%
	South Australia	76	64	75	215
		8.0%	6.9%	8.2%	7.7%
	Western Australia	107	93	89	289
		11.3%	10.1%	9.7%	10.4%
Tasmania	26	22	22	70	
	2.7%	2.4%	2.4%	2.5%	
Northern Territory	8	9	8	25	
	0.8%	1.0%	0.9%	0.9%	
Australian Capital Territory	10	23	14	47	
	1.1%	2.5%	1.5%	1.7%	
Metro/Regional	Metro	639	629	598	1866
		67.4%	68.3%	65.3%	67.0%
	Regional	309	292	318	919
		32.6%	31.7%	34.7%	33.0%
Education	Year 10 or below	79	79	90	248
		8.3%	8.6%	9.8%	8.9%
	Year 11 or equivalent	40	30	16	86
		4.2%	3.3%	1.7%	3.1%
	Year 12 or equivalent	158	151	138	447
		16.7%	16.4%	15.1%	16.1%
Trade certificate or Apprenticeship Certificate I or II	64	67	68	199	
	6.8%	7.3%	7.4%	7.1%	
		16	14	11	41

Demographic	Category	Stream A: Transport	Stream B: Domestic Use	Stream C: Export	Total
		1.7%	1.5%	1.2%	1.5%
	Certificate III or IV	98	107	101	306
		10.3%	11.6%	11.0%	11.0%
	Advanced Diploma / Diploma	131	122	150	403
		13.8%	13.2%	16.4%	14.5%
	Bachelor or Honours degree	252	241	244	737
		26.6%	26.2%	26.6%	26.5%
	Postgraduate degree (e.g. Masters, PhD)	108	107	95	310
		11.4%	11.6%	10.4%	11.1%
	Other (please specify)	2	3	3	8
		0.2%	0.3%	0.3%	0.3%
Household Type	Group household	97	99	82	278
		10.2%	10.7%	9.0%	10.0%
	Single person household	193	180	189	562
		20.4%	19.5%	20.6%	20.2%
	One parent with children	49	59	52	160
		5.2%	6.4%	5.7%	5.7%
	Couple with children	258	287	283	828
		27.2%	31.2%	30.9%	29.7%
	Couple with no children	302	249	266	817
		31.9%	27.0%	29.0%	29.3%
	Other family (e.g. extended family household)	49	47	44	140
		5.2%	5.1%	4.8%	5.0%
Occupational status	Student	61	63	48	172
		6.4%	6.8%	5.2%	6.2%
	Household duties	52	65	66	183
		5.5%	7.1%	7.2%	6.6%
	Employed – Part Time	180	182	163	525
		19.0%	19.8%	17.8%	18.9%
	Employed – Full Time	326	326	339	991
		34.4%	35.4%	37.0%	35.6%
	Unemployed not looking for work	7	14	13	34
		0.7%	1.5%	1.4%	1.2%
	Unemployed looking for work	51	49	44	144
		5.4%	5.3%	4.8%	5.2%
	Retired	181	142	164	487
		19.1%	15.4%	17.9%	17.5%
	Pensioner	61	51	45	157
		6.4%	5.5%	4.9%	5.6%
	Not able to work	13	18	22	53
		1.4%	2.0%	2.4%	1.9%
	Other (please specify)	16	11	12	39
		1.7%	1.2%	1.3%	1.4%
Gross annual household income	Less than \$25,000	91	101	84	276
		9.6%	11.0%	9.2%	9.9%
	\$25,000 - \$49,999	197	188	179	564
		20.8%	20.4%	19.5%	20.3%
	\$50,000 - \$74,999	167	151	151	469
		17.6%	16.4%	16.5%	16.8%
	\$75,000 - \$99,999	128	135	146	409
		13.5%	14.7%	15.9%	14.7%

<b>Demographic</b>	<b>Category</b>	<b>Stream A: Transport</b>	<b>Stream B: Domestic Use</b>	<b>Stream C: Export</b>	<b>Total</b>
	\$100,00 - \$124,999	105 11.1%	78 8.5%	100 10.9%	283 10.2%
	\$125,000 - \$174,999	80 8.4%	93 10.1%	91 9.9%	264 9.5%
	\$175,000 - \$199,999	32 3.4%	30 3.3%	35 3.8%	97 3.5%
	\$200,000 - \$299,999	27 2.8%	19 2.1%	23 2.5%	69 2.5%
	More than \$300,000	9 0.9%	10 1.1%	8 0.9%	27 1.0%
	Prefer not to answer	112 11.8%	116 12.6%	99 10.8%	327 11.7%

## A-5 Descriptive statistics from survey

QUESTION	N	Mean	St. Dev.
Q1 - When you hear the word hydrogen what are the first things that come to mind? (open-ended)	2785	-	-
Q2 - The following are some general questions about hydrogen properties. Please choose what you think is the right answer. (1 = Yes, 2 = No, 3 = I do not know)			
Is hydrogen heavier than air at room temperature?	2785	2.19	0.770
Is hydrogen available naturally in its pure form?	2785	1.98	0.889
Does hydrogen smell?	2785	2.21	0.638
Is hydrogen flammable in air?	2785	1.78	0.890
Can hydrogen be stored as a liquid?	2785	1.73	0.918
Q3 - How much do you know about the following? (1 = I have never heard of it, 2 = I have heard of it, 3 = I know about it and could describe it to a friend)			
How hydrogen is produced	2785	1.58	0.650
The use of hydrogen fuel cells in vehicles	2785	1.66	0.603
The use of hydrogen fuel cells in homes	2785	1.37	0.581
Hydrogen as an energy storage medium for electricity	2785	1.44	0.600
Hydrogen refuelling stations	2785	1.47	0.600
Burning hydrogen as a replacement for natural gas	2785	1.47	0.603
Q4 - Overall, how do you feel about hydrogen as a possible solution for energy and environmental challenges? (1 = Very supportive, 5 = Very unsupportive)	2785	2.33	0.805
Q5 - To what extent do you agree or disagree with the following statements about hydrogen production for energy? (1 = Strongly disagree, 5 = Strongly agree)			
Hydrogen should be produced using renewable energy and electrolysis only.	2785	3.61	0.833
Hydrogen should be produced using fossil fuels with CCS as an intermediate step while transitioning to renewables	2785	3.20	0.913
Hydrogen should be produced using fossil fuels with CCS indefinitely	2785	2.84	1.013
The use of hydrogen contributes to climate protection	2785	3.50	0.857
Q6 - To what extent do you agree or disagree with the following statements about using hydrogen for transport? (1 = Strongly disagree, 5 = Strongly agree)			
If the cost was the same as my current vehicle, I would be happy to buy a hydrogen fuel cell electric vehicle	948	3.64	0.953
I would not mind if a local petrol station introduced hydrogen refuelling bowsers	948	3.84	0.858
I would not mind if a hydrogen refuelling station was built near me	948	3.54	1.007
I support the construction of nationwide hydrogen refuelling stations in Australia	948	3.74	0.862
I support the introduction of hydrogen fuel cell buses	948	3.83	0.847
I would be happy to be a passenger in a fuel cell bus	948	3.82	0.867
I support the introduction of hydrogen fuel cell long-haul trucks	948	3.78	0.898
Q7 - How important are the following factors in determining whether or not you would support the introduction of hydrogen fuel cell buses? (1 = Not at all important, 2 = Slightly important, 3 = Somewhat important, 4 = Very important, 5 = Extremely important)			
Cost to passengers (fare prices)	948	3.66	1.008
Cost to local council	948	3.38	1.026
Environmental benefits	948	4.04	0.936
Disruption to services	948	3.55	0.985
Adequate safety tests	948	4.35	0.845
Cost/benefit comparison done with battery electric buses	948	3.92	0.867
Australia being a technology leader	948	3.41	1.102
Q8 - How important are the following factors in determining whether or not you would purchase a fuel cell vehicle? (1 = Not at all important, 2 = Slightly important, 3 = Somewhat important, 4 = Very important, 5 = Extremely important)			
Cost to purchase vehicle relative to conventional vehicles	948	3.89	0.914
Cost to purchase hydrogen to refuel compared with conventional fuel types	948	3.93	0.914
Its performance (i.e. power, acceleration, handling)	948	3.72	0.941
Its safety features	948	4.27	0.861

QUESTION	N	Mean	St. Dev.
That it emits no greenhouse gas emissions	948	3.90	1.022
That it helps to reduce air pollution (such as SOx, NOx, particulates)	948	3.96	0.995
That it is very quiet to run (i.e. low noise)	948	3.45	1.071
That it has the ability to drive similar distances to conventional vehicles before refuelling	948	3.99	0.887
The time it takes to refuel	948	3.55	1.028
Convenient location of refuelling infrastructure	948	4.01	0.877
The way it looks	948	2.86	1.188
Q9 - If the government were to introduce incentives to promote the deployment of hydrogen fuel cell electric vehicles, which of the following incentives would likely motivate you to purchase one? (1 = most important, 6 = not at all important)			
Lower registration costs	948	2.43	1.201
Lower fuel costs	948	1.79	1.177
Access to priority/bus lanes	948	4.87	1.283
Free parking in the city	948	4.59	1.372
Road toll exemption	948	4.09	1.241
Tax exemption	948	3.23	1.435
Q10 - If the price, features, design, brand, etc. were the same, how likely would you be to purchase the following type of car? (1 = Very unlikely, 5 = Very likely)			
Conventional petrol or diesel vehicle	948	3.43	1.046
Battery electric vehicle	948	3.24	1.048
Hybrid vehicle	948	3.37	0.992
Hydrogen fuel cell vehicle	948	3.55	1.000
Fully autonomous vehicle	948	2.87	1.187
Q11 - Please explain the reason for your vehicle preferences? (open-ended)	948	-	-
Q12 - How important are the following factors in determining whether or not you would live in a hydrogen home? (1 = Not at all important, 2 = Slightly important, 3 = Somewhat important, 4 = Very important, 5 = Extremely important)			
The cost to modify appliances	921	3.65	0.967
The cost of hydrogen to fuel your home	921	3.84	0.895
The level of inconvenience to change over	921	3.36	1.035
Safety	921	4.36	0.863
Flame colour/visibility	921	3.52	1.122
Odour for detecting leaks	921	3.99	0.980
No greenhouse gas emissions	921	3.86	1.027
Health benefits (no carbon monoxide emissions)	921	4.12	0.895
Proven demonstration projects	921	3.85	0.926
Being able to choose between gas or electricity for cooking	921	3.65	1.022
Q13 - To what extent do you agree or disagree with the following statements about hydrogen for domestic use? (1 = Strongly disagree, 5 = Strongly agree)			
I would be happy to use hydrogen for space heating	921	3.58	0.823
I would be happy to use hydrogen for hot water heating	921	3.68	0.832
I would be happy to use hydrogen for cooking	921	3.58	0.864
I would be happy to use hydrogen for on-site electricity generation	921	3.67	0.822
Hydrogen should be used increasingly for the energy supply in Australia	921	3.69	0.828
I fear that hydrogen would be too expensive for the energy supply	921	3.54	0.894
I would have no concerns if hydrogen were stored underground like natural gas	921	3.34	0.902
I would be happy to use natural gas that contains some hydrogen	921	3.65	0.790
Q14 - How would you feel about the following? (1 = Very unsupportive, 5 = Very supportive)			
Hydrogen was piped (up to 10%) into existing natural gas networks	921	3.58	0.770
Hydrogen was blended (up to 10%) into existing natural gas networks	921	3.61	0.773
Hydrogen was injected (up to 10%) into existing natural gas networks	921	3.57	0.784
Natural gas was replaced with 100% hydrogen in existing gas networks	921	3.33	0.899
Gas networks were replaced with 100% electrification	921	3.12	0.958

QUESTION	N	Mean	St. Dev.
Q15 - If Australia was to start exporting hydrogen how important are the following considerations to you? (1 = Not at all important, 2 = Slightly important, 3 = Somewhat important, 4 = Very important, 5 = Extremely important)			
Increased economic benefits to Australia	916	3.67	0.960
New job opportunities	916	3.77	0.946
Retaining the rights of intellectual property for hydrogen production	916	3.63	1.035
Australia being an early mover in the export market	916	3.64	1.012
Contributing to the world's emissions reductions	916	3.84	0.998
Supporting the development of a local manufacturing industry	916	3.79	0.917
Creating regional opportunities through the production of hydrogen	916	3.73	0.937
Ensuring availability of a domestic hydrogen supply	916	3.79	0.941
The overall use of water	916	3.83	0.963
Safety of the production process	916	4.11	0.937
Minimising the environmental impacts of the production and transport process	916	4.04	0.985
The way hydrogen is transported (e.g. liquefied hydrogen or conversion to a carrier such as ammonia)	916	3.82	0.958
Q16 - I support the idea of Australia exporting hydrogen (1 = Strongly agree, 5 = Strongly disagree)	916	2.07	0.854
Q17 - I support the idea of a hydrogen export facility being built near me (1 = Strongly agree, 5 = Strongly disagree)	916	2.79	1.088
Q18a - If a hydrogen economy was to be developed in Australia, to what extent do you agree or disagree that the following groups would act in the best interest of the consumer? (1 = Strongly disagree, 5 = Strongly agree)			
Federal government	2785	3.32	1.105
State government	2785	3.32	1.059
Local government	2785	3.23	1.024
Electricity generation companies	2785	2.99	1.130
Fuel/gas supply companies	2785	2.97	1.173
Car/appliance manufacturers	2785	3.15	1.037
Universities	2785	3.64	0.899
CSIRO	2785	3.81	0.884
Media	2785	3.02	0.993
Q18b - If a hydrogen economy was to be developed in Australia, who should be responsible for disseminating information? (Tick all that apply)			
Government	2726	0.69	0.463
Industry	2726	0.44	0.497
Research organisations	2726	0.50	0.500
Collaboration	2726	0.26	0.441
Independent body	2726	0.37	0.484
Media	2726	0.22	0.415
Other (please specify)	2726	0.02	0.150
Q18c - If a hydrogen economy was to be developed in Australia, what should the government's role be? (Tick all that apply)			
Regulation	2726	0.75	0.431
Development of standards	2726	0.65	0.478
Funding research	2726	0.57	0.495
Incentives for consumers	2726	0.53	0.499
Incentives for business/industry	2726	0.47	0.499
International partnerships	2726	0.31	0.463
Developing a long term strategy	2726	0.62	0.486
Education	2726	0.49	0.500
Other (please specify)	2726	0.02	0.144
Q19 - If a hydrogen economy was to be developed in Australia, I trust that there are/will be adequate safety precautions to keep the risks under control (1 = Strongly agree, 5 = Strongly disagree)	2785	1.89	0.918

QUESTION	N	Mean	St. Dev.
Q20 - What would you be willing to pay for the use of hydrogen technologies? I would be willing to pay <b>a lot more</b> than conventional technologies if there were clear environmental benefits. I would be willing to pay <b>a little bit more</b> than conventional technologies if there were clear environmental benefits. I would be willing to pay <b>only if costs were comparable</b> to conventional technologies even if there were clear environment I would be willing to pay <b>only if hydrogen was cheaper</b> than conventional technologies even if there were clear environmental benefits. I would <b>not be willing to pay</b> for hydrogen technologies even if there were clear environmental benefits.	2785	2.90	1.029
Q21 - What do you see as the main benefits and/or opportunities associated with the use of hydrogen technologies? (open-ended)	2785	-	-
Q22 - What are your main concerns associated with the use of hydrogen technologies? (open-ended)	2785	-	-
Q23 - Do you believe global warming is happening now or will happen in the next 30 years? Yes, it is already happening. It will start happening within the next 30 years. No, it is not happening and won't. I do not know/ I am not sure	2785	1.65	1.069
Q24 - Please indicate the extent to which you agree or disagree with each of the statements below. (1 = Strongly disagree, 5 = Strongly agree)			
Global warming is a problem for society.	2785	4.00	1.080
Energy savings help reduce global warming.	2785	3.76	0.984
I am jointly responsible for the energy problems.	2785	3.62	0.998
I feel jointly responsible for the exhaustion of energy sources.	2785	3.48	1.039
I feel personally obliged to save as much energy as possibly.	2785	3.82	0.949
I feel morally obliged to save energy, regardless of what others do.	2785	3.81	0.972
Plants and animals have as much right as humans to exist.	2785	4.14	0.913
Humans are seriously abusing the environment.	2785	4.13	0.952
Q25 - How often do you perform the following in your daily life? (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Frequently, 5 = Always)			
Turn off lights when leaving a room	2785	4.40	0.799
Cut down on using heating/ air conditioning to reduce energy consumption	2785	4.14	0.932
Only run full loads when using washing machines or dishwashers	2785	4.23	0.918
Washing clothes using cold water instead of warm/hot water	2785	4.24	1.046
Switch off standby mode of appliances/ electronic devices (e.g. TV, computer)	2785	3.61	1.211
Air dry laundry instead of using a clothes dryer	2785	4.34	0.990
Take public transport, walk or cycle when possible to reduce the use of a car	2785	3.18	1.317
Drive an electric car	2785	1.43	1.025
Q26 - To what extent do you agree or disagree with the following statements about markets? (1 = Strongly disagree, 5 = Strongly agree)			
An economic system based on free markets and unrestrained by government interference automatically works best to meet human needs.	2785	3.04	0.988
I support the free-market system, but not at the expense of environmental quality.	2785	3.57	0.865
The free-market system may be efficient for resource allocation, but it is limited in its capacity to promote social justice.	2785	3.57	0.830
The preservation of the free market system is more important than localised environmental concerns.	2785	2.89	1.008
Free and unregulated markets pose important threats to sustainable development.	2785	3.55	0.882
The free-market system is likely to promote unsustainable consumption.	2785	3.49	0.859
Q27 - When thinking of your response to new technology, which best describes you? I closely follow new technology and take risks by being the first to purchase it. (Innovator)	2785	3.06	0.905

QUESTION	N	Mean	St. Dev.
I see the potential advantages in new technology and am one of the first to make use of its advantages and to profit from it. (Early adopter)			
I am interested in new technology but at the same time I am pragmatic. I like to take time and be persuaded by the advantages. My decisions are (mainly) based on the recommendations of existing users. (Early majority)			
I am not thrilled by new technology, but rather appreciate security. It is safe to purchase a product when it has been on the market for some while and offers obvious advantages. (Late majority)			
I am traditional and have little affinity with new technology. I do not like changes in life and I purchase products only when the existing model I use is not produced anymore. (Traditionalist)			
Q28 - Which of the following do you use in your household? (Tick all that apply)			
Electricity (grid connected)	2785	0.92	0.277
Gas (mains)	2785	0.49	0.500
Gas (bottled)	2785	0.19	0.391
Solar hot water	2785	0.16	0.368
Solar PV (rooftop)	2785	0.22	0.416
Battery electric vehicle	2785	0.02	0.153
Others (please specify)	2785	0.02	0.122
I do not have access to mains power	2785	0.01	0.103
Q29 - How frequently do you use the following modes of transport? (1 = Daily, 2 = 2-3 times a week, 3 = 2-3 times a month, 4 = Rarely, 5 = Never)			
Public transport (bus, train, and ferry)	2785	3.33	1.280
Bicycle	2785	4.24	1.093
Walk	2785	2.20	1.271
Uber or taxi	2785	4.15	0.862
Drive own car	2785	2.00	1.292
CAR RENTALS	2785	4.46	0.756
CAR SHARING (paying a third party to use their car as an alternative to owning a car)	2785	4.64	0.817
CAR POOLING (car sharing/ride-sharing – when more than one person travels in a car to reduce the number of cars on the road)	2785	4.49	0.945
Q30 - How often do you experience the following electricity supply problems in your household? (1 = Never, 2 = Seldom, 3 = Sometimes, 4 = Often, 5 = Almost always)			
Power outages (including planned & unplanned blackouts)	2785	2.16	0.805
Supply disturbances (e.g. flickers, dimming, interruptions)	2785	2.11	0.882
Q31 - Which best describes your situation in relation to your electricity bill?	2785	2.08	1.433
Paying my electricity bill in full is never a problem for me			
I sometimes find it hard to pay my electricity bill when it becomes due			
I always struggle to pay my electricity bill when it becomes due			
My electricity bill is usually in credit after factoring in solar feed-in tariffs.			
I pre-pay my electricity bill			
I do not pay for electricity in my house			
Q32 - What is your current status in relation to solar energy?	2785	2.63	1.232
I have solar PV panels installed to supply my home			
I intend to install solar PV panels within the next 5 years			
I do not intend to install solar PV panels			
I do not know			
Other (please specify)			
Q33 - Do you subscribe to GreenPower? (1 = Yes, if yes what percentage? 2 = No; 3 = Do not know)	2785	2.13	0.440

## A-6 Copy of survey

### Investigating the Australian public's perception of hydrogen for energy National Survey

#### Project overview

The aim of this research is to investigate the Australia public's attitudes to hydrogen, and the publically perceived risks and benefits of hydrogen development and its potential uses in Australia and beyond. This survey is part of a larger research project to advance understanding of the socio-economic challenges for hydrogen and associated emerging opportunities. The research is being funded by the Australian Renewable Energy Agency (ARENA) and the results of this survey will be used to inform the wider sector, including Government, industry and further research. The information will also be published in relevant journals and other academic publications.

#### What is involved?

You are invited to respond to this online survey which will take approximately 20 minutes of your time. We are keen to access the views of a range of Australians and you do not have to be an expert on the subject to participate.

#### Do I have to be a part of this program?

Completion of the online survey is completely voluntary and you are free to withdraw at any time without prejudice or penalty. We would like to encourage you to participate in the study as your participation will ensure that we understand your opinion about hydrogen as well as your preferred outcomes when considering the various uses for hydrogen.

#### Withdrawal from participation

Please note, if you decide to withdraw, it is unlikely we can identify your responses and therefore we will be unable to delete your responses completed to date.

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#### Feedback on the study

The final outcomes of the research will be made available on the ARENA website (<https://arena.gov.au>) and you will also be emailed a copy of the summary of results arising from this research if you indicate you would like to receive the summary from the market research company.

- Yes, I have reviewed the information above and I agree to participate in this online survey
- No, sorry I do not wish to participate in this online survey

1. In what year were you born?

2. What is your gender?

- Male
- Female
- Gender diverse
- Intersex
- Indeterminate
- Prefer not to answer

3. Are you of Aboriginal or Torres Strait Islander origin?
  - No
  - Yes, Aboriginal
  - Yes, Torres Strait Islander

4. What is the postcode of your home address?

### Hydrogen Initial Knowledge

5. When you hear the word hydrogen what are the first things that come to mind? [open ended question]
  
6. The following are some general questions about hydrogen properties. Please choose what you think is the right answer.

	Yes	No	I do not know
Is hydrogen heavier than air at room temperature?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is hydrogen available naturally in its pure form?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Does hydrogen smell?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is hydrogen flammable in air?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Can hydrogen be stored as a liquid?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. How much do you know about the following?

	I have never heard of it	I have heard of it	I know about it and could describe it to a friend
How hydrogen is produced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The use of hydrogen fuel cells in vehicles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The use of hydrogen fuel cells in homes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrogen as an energy storage medium for electricity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrogen refuelling stations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Burning hydrogen as a replacement for natural gas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. Overall, how do you feel about hydrogen as a possible solution for energy and environmental challenges?
  - Very supportive
  - Supportive
  - Neither supportive nor unsupportive
  - Unsupportive
  - Very unsupportive

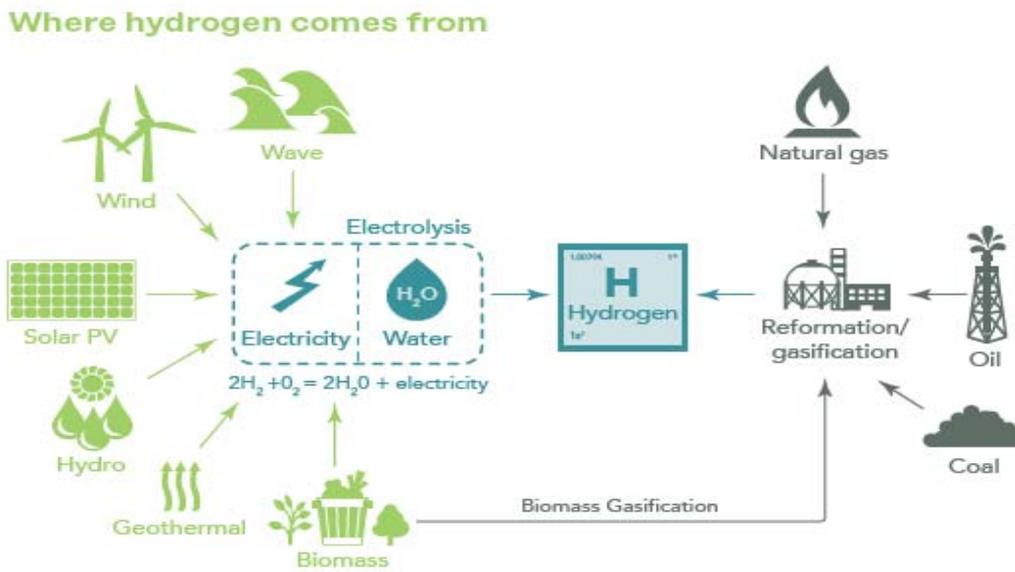
### Hydrogen Energy

The video below introduces you to some of the concepts around hydrogen energy. Once you have watched the video, press next to continue.

<https://www.youtube.com/watch?v=Kv8WT3-7ZHE> (SENA VIDEO 3minutes 22)

### Hydrogen Production

Hydrogen can be produced from electrolysis of water using renewable energy sources. Electrolysis uses electricity to split water molecules into hydrogen and oxygen and produces no greenhouse gas emissions. Hydrogen can also be produced from fossil fuels, and when combined with carbon capture and storage (CCS), up to 93% of greenhouse gas emissions are prevented from being released. CCS involves capturing carbon dioxide before it is emitted into the atmosphere and storing it deep underground.



Source: Hydrogen Mobility Australia

9. To what extent do you agree or disagree with the following statements about hydrogen production for energy?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Hydrogen should be produced using renewable energy and electrolysis only.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrogen should be produced using fossil fuels with CCS as an intermediate step while transitioning to renewables	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrogen should be produced using fossil fuels with CCS indefinitely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The use of hydrogen contributes to climate protection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

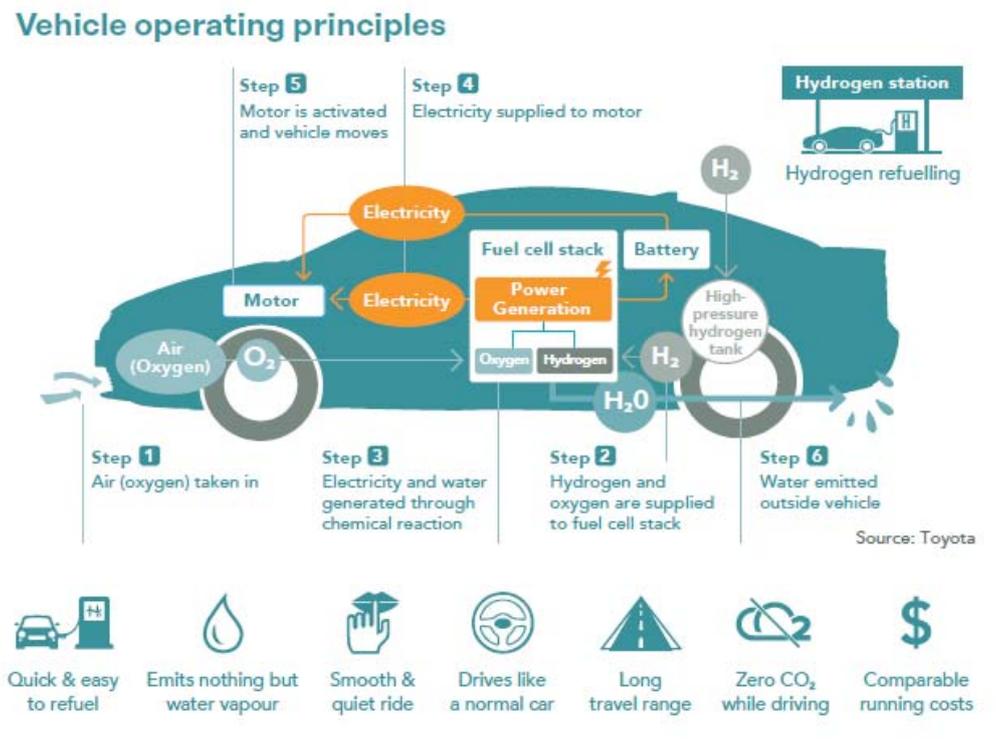
In order to keep the survey to a 20 minute maximum, participants will complete only one of three streams: Transport, Domestic, Export

STREAM A: Transport

Hydrogen can be used to power fuel cell electric vehicles. As shown in the diagram below hydrogen combines with oxygen from the air to form water, heat and electricity. Fuel cell electric vehicles emit no carbon emissions and the only tail pipe emission is water vapour. Fuel cell electric vehicles have faster refuelling times (approximately 3 minutes) and are typically able to travel longer distances when compared to battery electric vehicles. Refuelling requires a specialised hydrogen refuelling station however, whereas battery electric vehicles can be recharged from a grid connected charge point.

Hydrogen fuel cells can be used to power a range of vehicles including cars, buses, trucks, forklifts, trains, ships and even light aircraft.

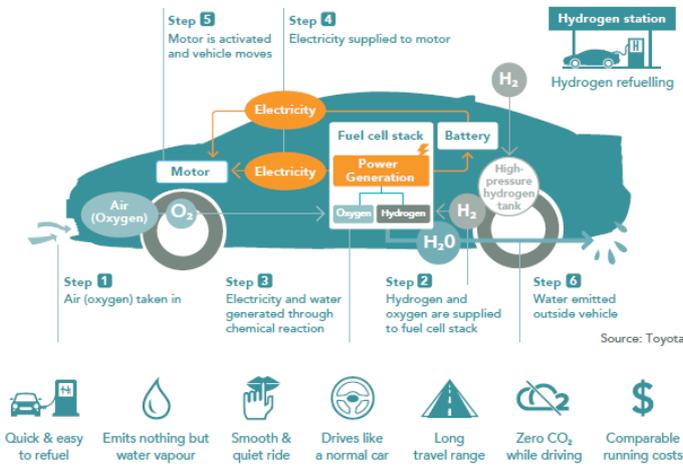
STREAM A1: INSERT THIS SINGLE IMAGE



Source: Hydrogen Mobility Australia

STREAM A2: INSERT THIS DOUBLE IMAGE

Vehicle operating principles



Hydrogen refuelling infrastructure



Source: Hydrogen Mobility Australia

10. To what extent do you agree or disagree with the following statements about using hydrogen for transport?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
If the cost was the same as my current vehicle, I would be happy to buy a hydrogen fuel cell electric vehicle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would not mind if a local petrol station introduced hydrogen refuelling bowsers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would not mind if a hydrogen refuelling station was built near me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I support the construction of nationwide hydrogen refuelling stations in Australia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I support the introduction of hydrogen fuel cell buses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would be happy to be a passenger in a fuel cell bus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I support the introduction of hydrogen fuel cell long-haul trucks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. How important are the following factors in determining whether or not you would support the introduction of hydrogen fuel cell buses?

	Not at all important	Slightly important	Somewhat important	Very important	Extremely important
Cost to passengers (fare prices)	<input type="radio"/>				
Cost to local council	<input type="radio"/>				
Environmental benefits	<input type="radio"/>				
Disruption to services	<input type="radio"/>				
Adequate safety tests	<input type="radio"/>				
Cost/benefit comparison done with battery electric buses	<input type="radio"/>				
Australia being a technology leader	<input type="radio"/>				

12. How important are the following factors in determining whether or not you would purchase a fuel cell vehicle?

	Not at all important	Slightly important	Somewhat important	Very important	Extremely important
Cost to purchase vehicle relative to conventional vehicles	<input type="radio"/>				
Cost to purchase hydrogen to refuel compared with conventional fuel types	<input type="radio"/>				
Its performance (i.e. power, acceleration, handling)	<input type="radio"/>				
Its safety features	<input type="radio"/>				
That it emits no greenhouse gas emissions	<input type="radio"/>				
That it helps to reduce air pollution (such as SOx, NOx, particulates)	<input type="radio"/>				
That it is very quiet to run (i.e. low noise)	<input type="radio"/>				
That it has the ability to drive similar distances to conventional vehicles before refuelling	<input type="radio"/>				
The time it takes to refuel	<input type="radio"/>				
Convenient location of refuelling infrastructure	<input type="radio"/>				
The way it looks	<input type="radio"/>				

13. If the government were to introduce incentives to promote the deployment of hydrogen fuel cell electric vehicles, which of the following incentives would likely motivate you to purchase one? Please rank on a scale of 1 most important to 6 not at all important

Incentive type
Lower registration costs
Lower fuel costs
Access to priority/bus lanes
Free parking in the city
Road toll exemption
Tax exemption

14. If the price, features, design, brand, etc. were the same, how likely would you be to purchase the following type of car?

	Very unlikely	Unlikely	Neither likely or unlikely	Likely	Very likely
Conventional petrol or diesel vehicle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Battery electric vehicle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hybrid vehicle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrogen fuel cell vehicle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fully autonomous vehicle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. Please explain the reason for your vehicle preferences? (open ended) -

\_\_\_\_\_

**STREAM B: Home/domestic use/natural gas network**

Power for space heating (for heating rooms in a house), hot water and cooking can be provided by natural gas or electricity. As the proportion of renewable generation on the electricity grid is increased, emissions from this source decrease. It is also possible to decrease emissions from the gas grid, using hydrogen.

This could be achieved by piping low emissions hydrogen into the existing gas network (at around 10%), which does not require any changes to either the network or appliances in the home. Up to 20% hydrogen blends have already been trialled in projects in Europe (GRHYD project in France, and E.on and REW projects in Germany).

The gas network could also be completely emissions free if all of the gas were to be replaced with hydrogen. This transition requires modification of the gas pipelines (although in some places existing networks are already suitable) and modification of household appliances. A 100% hydrogen conversion project is currently being developed for the city of Leeds in the U.K.

16. How important are the following factors in determining whether or not you would live in a hydrogen home?

	Not at all important	Slightly important	Somewhat important	Very important	Extremely important
The cost to modify appliances	<input type="radio"/>				
The cost of hydrogen to fuel your home	<input type="radio"/>				
The level of inconvenience to change over	<input type="radio"/>				
Safety	<input type="radio"/>				
Flame colour/visibility	<input type="radio"/>				
Odour for detecting leaks	<input type="radio"/>				
No greenhouse gas emissions	<input type="radio"/>				
Health benefits (no carbon monoxide emissions)	<input type="radio"/>				
Proven demonstration projects	<input type="radio"/>				
Being able to choose between gas or electricity for cooking	<input type="radio"/>				

17. To what extent do you agree or disagree with the following statements about hydrogen for domestic use?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I would be happy to use hydrogen for space heating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would be happy to use hydrogen for hot water heating	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would be happy to use hydrogen for cooking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would be happy to use hydrogen for on-site electricity generation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

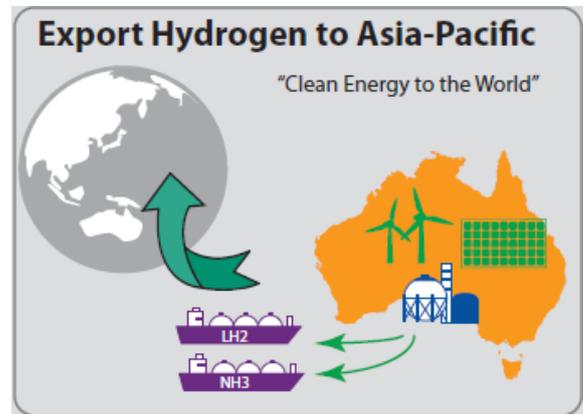
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Hydrogen should be used increasingly for the energy supply in Australia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I fear that hydrogen would be too expensive for the energy supply	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would have no concerns if hydrogen were stored underground like natural gas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would be happy to use natural gas that contains some hydrogen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. How would you feel about the following?

	Very un-supportive	Un-supportive	Neither supportive nor un-supportive	Supportive	Very supportive
Hydrogen was piped (up to 10%) into existing natural gas networks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrogen was blended (up to 10%) into existing natural gas networks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrogen was injected (up to 10%) into existing natural gas networks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Natural gas was replaced with 100% hydrogen in existing gas networks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gas networks were replaced with 100% electrification	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### STREAM C: Export

Nations like Japan and South Korea import most of their energy in the form of coal, oil and natural gas. In an effort to reduce their carbon dioxide emissions both countries plan to transition towards low emissions energy, however they will not be able to produce enough domestically. A solution could be for these countries to import low emissions hydrogen (produced from either fossil fuels with CCS, or renewables) from places such as Australia. Hydrogen can be shipped as liquefied hydrogen, or converted to a 'carrier' such as ammonia. Japan are already beginning to look at small scale projects that import hydrogen from Norway, Brunei and Australia, in time for the 2020 Tokyo Olympics.



Source: Hydrogen Mobility Australia "The Facts" 2017

19. If Australia was to start exporting hydrogen how important are the following considerations to you?

	Not at all important	Slightly important	Somewhat important	Very important	Extremely important
Increased economic benefits to Australia	<input type="radio"/>				
New job opportunities	<input type="radio"/>				
Retaining the rights of intellectual property for hydrogen production	<input type="radio"/>				
Australia being an early mover in the export market	<input type="radio"/>				
Contributing to the world's emissions reductions	<input type="radio"/>				
Supporting the development of a local manufacturing industry	<input type="radio"/>				
Creating regional opportunities through the production of hydrogen	<input type="radio"/>				
Ensuring availability of a domestic hydrogen supply	<input type="radio"/>				
The overall use of water	<input type="radio"/>				
Safety of the production process	<input type="radio"/>				
Minimising the environmental impacts of the production and transport process	<input type="radio"/>				
The way hydrogen is transported (e.g. liquefied hydrogen or conversion to a carrier such as ammonia)	<input type="radio"/>				

20. I support the idea of Australia exporting hydrogen

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

21. I support the idea of a hydrogen export facility being built near me

- Strongly agree
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

**END OF SPLIT STREAMS – ALL PARTICIPANTS ANSWERED THE REMAINING QUESTIONS**

**Trust**

22. If a hydrogen economy was to be developed in Australia, to what extent do you agree or disagree that the following groups would act in the best interest of the consumer?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Federal government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
State government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local government	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Electricity generation companies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fuel/gas supply companies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Car/appliance manufacturers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Universities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CSIRO	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Media	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23. If a hydrogen economy was to be developed in Australia, who should be responsible for disseminating information? (Tick all that apply)

- Government
- Industry
- Research organisations
- Collaboration
- Independent body
- Media
- Other (please specify)

24. If a hydrogen economy was to be developed in Australia, what should the government's role be? (Tick all that apply)

- Regulation
- Development of standards
- Funding research
- Incentives for consumers
- Incentives for business/industry
- International partnerships

- Developing a long term strategy
- Education
- Other (please specify)

25. If a hydrogen economy was to be developed in Australia, I trust that there are/will be adequate safety precautions to keep the risks under control
- Strongly agree
  - Agree
  - Neither agree nor disagree
  - Disagree
  - Strongly disagree

### **General**

26. What would you be willing to pay for the use of hydrogen technologies?
- I would be willing to pay a lot more than conventional technologies if there were clear environmental benefits.
  - I would be willing to pay a little bit more than conventional technologies if there were clear environmental benefits.
  - I would be willing to pay only if costs were comparable to conventional technologies even if there were clear environmental benefits.
  - I would be willing to pay only if hydrogen was cheaper than conventional technologies even if there were clear environmental benefits.
  - I would not be willing to pay for hydrogen technologies even if there were clear environmental benefits.
27. What do you see as the main benefits and/or opportunities associated with the use of hydrogen technologies? (open ended)
28. What are your main concerns associated with the use of hydrogen technologies? (open ended)

### **Attitudes**

29. Do you believe global warming is happening now or will happen in the next 30 years?
- Yes, it is already happening.
  - It will start happening within the next 30 years.
  - No, it is not happening and won't.
  - I do not know/ I am not sure

30. Please indicate the extent to which you agree or disagree with each of the statements below.

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Global warming is a problem for society.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Energy savings help reduce global warming.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am jointly responsible for the energy problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel jointly responsible for the exhaustion of energy sources.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel personally obliged to save as much energy as possibly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel morally obliged to save energy, regardless of what others do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Plants and animals have as much right as humans to exist.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Humans are seriously abusing the environment.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

31. How often do you perform the following in your daily life?

	Never	Rarely	Sometimes	Frequently	Always
Turn off lights when leaving a room	<input type="radio"/>				
Cut down on using heating/ air conditioning to reduce energy consumption	<input type="radio"/>				

	Never	Rarely	Sometimes	Frequently	Always
Only run full loads when using washing machines or dishwashers	<input type="radio"/>				
Washing clothes using cold water instead of warm/hot water	<input type="radio"/>				
Switch off standby mode of appliances/ electronic devices (e.g. TV, computer)	<input type="radio"/>				
Air dry laundry instead of using a clothes dryer	<input type="radio"/>				
Take public transport, walk or cycle when possible to reduce the use of a car	<input type="radio"/>				
Drive an electric car	<input type="radio"/>				

32. To what extent do you agree or disagree with the following statements about markets?

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
An economic system based on free markets and unrestrained by government interference automatically works best to meet human needs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I support the free-market system, but not at the expense of environmental quality.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The free-market system may be efficient for resource allocation, but it is limited in its capacity to promote social justice.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The preservation of the free market system is more important than localised environmental concerns.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Free and unregulated markets pose important threats to sustainable development.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The free-market system is likely to promote unsustainable consumption.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

33. When thinking of your response to new technology, which best describes you?

- I closely follow new technology and take risks by being the first to purchase it.
- I see the potential advantages in new technology and am one of the first to make use of its advantages and to profit from it.
- I am interested in new technology but at the same time I am pragmatic. I like to take time and be persuaded by the advantages. My decisions are (mainly) based on the recommendations of existing users.
- I am not thrilled by new technology, but rather appreciate security. It is safe to purchase a product when it has been on the market for some while and offers obvious advantages
- I am traditional and have little affinity with new technology. I do not like changes in life and I purchase products only when the existing model I use is not produced anymore.

## Energy and Transport

34. Which of the following do you use in your household? (Tick all that apply)

- Electricity (grid connected)
- Gas (mains)
- Gas (bottled)
- Solar hot water
- Solar PV (rooftop)
- Battery electric vehicle
- Others (please specify) \_\_\_\_\_
- I do not have access to mains power

35. How frequently do you use the following modes of transport?

	Daily	2-3 times a week	2-3 times a month	Rarely	Never
Public transport (bus, train, and ferry)	<input type="checkbox"/>				
Bicycle	<input type="checkbox"/>				
Walk	<input type="checkbox"/>				
Uber or taxi	<input type="checkbox"/>				
Drive own car	<input type="checkbox"/>				
Car rentals	<input type="checkbox"/>				
Car sharing (paying a third party to use their car as an alternative to owning a car)	<input type="checkbox"/>				
Car pooling (car sharing/ride-sharing – when more than one person travels in a car to reduce the number of cars on the road)	<input type="checkbox"/>				

36. How often do you experience the following electricity supply problems in your household?

	Never	Seldom	Sometimes	Often	Almost always
Power outages (including planned & unplanned blackouts)	<input type="checkbox"/>				
Supply disturbances (e.g. flickers, dimming, interruptions)	<input type="checkbox"/>				

37. Which best describes your situation in relation to your electricity bill?

- Paying my electricity bill in full is never a problem for me
- I sometimes find it hard to pay my electricity bill when it becomes due
- I always struggle to pay my electricity bill when it becomes due
- My electricity bill is usually in credit after factoring in solar feed-in tariffs
- I pre-pay my electricity bill
- I do not pay for electricity in my house

38. What is your current status in relation to solar energy?
- I have solar PV panels installed to supply my home
  - I intend to install solar PV panels within the next 5 years
  - I do not intend to install solar PV panels
  - I do not know
  - Other (please specify) \_\_\_\_\_

39. Do you subscribe to GreenPower?
- Yes, if yes what percentage? \_\_\_\_\_
  - No
  - Do not know

### Demographics

40. Which of the following best describes your household?
- Group household
  - Single person household
  - One parent with children
  - Couple with children
  - Couple with no children
  - Other family (e.g. extended family household)
41. Which best describes your highest level of education you have completed?
- Year 10 or below
  - Year 11 or equivalent
  - Year 12 or equivalent
  - Trade certificate or Apprenticeship
  - Certificate I or II
  - Certificate III or IV
  - Advanced Diploma / Diploma
  - Bachelor or Honours degree
  - Postgraduate degree (e.g. Masters, PhD)
  - Other (please specify) \_\_\_\_\_
42. Which of the following best describes your occupational status?
- Student
  - Household duties
  - Employed – Part Time
  - Employed – Full Time
  - Unemployed not looking for work
  - Unemployed looking for work
  - Retired
  - Pensioner
  - Not able to work
  - Other (please specify) \_\_\_\_\_

43. Which occupational sector do you work in?

- Agriculture, forestry, fishing
- Mining
- Manufacturing
- Electricity, gas, water, waste services
- Construction
- Wholesale trade
- Retail trade
- Accommodation and food services
- Transport, postal and warehousing
- Information, media and telecommunications
- Financial and Insurance services
- Rental, hiring and real estate services
- Professional, scientific, technical services
- Administrative and support workers
- Public administration and safety
- Education and training
- Health care and social assistance
- Arts and recreation services
- Other services

44. How much is your estimated gross annual household income?

- Less than \$25,000
- \$25,000 - \$49,999
- \$50,000 - \$74,999
- \$75,000 - \$99,999
- \$100,000 - \$124,999
- \$125,000 - \$174,999
- \$175,000 - \$199,999
- \$200,000 - \$299,999
- More than \$300,000
- Prefer not to answer

45. In which country were you born?

46. Were either your mother or your father, or both, born overseas?

- My mother was born overseas
- My father was born overseas
- Both my parents were born overseas
- Neither of my parents were born overseas



## Contact details

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