# AHC POLICY ADVISORY COMMITTEE MEETING

## AUSTRALIAN HYDROGEN COUNCIL

12 MAY 2020

# PAC AGENDA

| # | Detail | Time | Lead |
|---|---|---|---|
| 1. | Open | 10.00 – 10.05 | Fiona Simon |
| 2. | Competition compliance statement | 10.05 – 10.10 | Fiona Simon |
| 3. | CEO report:<br>• COVID-19 survey outcomes<br>• Government update<br>• Membership and consortium opportunities<br>• $H_2$ under $2 work<br>• Committee and Working Group overview | 10.10 – 10.35 | Fiona Simon |
| 4. | NSW government hydrogen update | 10.35 – 10.45 | Tim Stock (Project Director, Hydrogen and Clean Energy) |
| 5. | WG updates:<br>• WG1: Export markets, including a guarantee of origin<br>• WG2: Energy regulatory and market reform<br>• WG3: Social licence | 10.45 – 11.45 | Felicity Underhill, Diana Russell Coote<br>Fiona Simon<br>Fiona Simon |
| 6. | Other business<br>• Member directory | 11.45 – 11.55 | All |
| 7. | Close | 11.55 – 12.00 | Fiona Simon |

# COMPLIANCE STATEMENT

The AHC and its members are committed to observing their Competition and Consumer Act 2010 (Cth)) (the Act) obligations regarding:

- communication and promotions;
- conscionable and fair business practices; and
- dealing in a manner that does not restrain competition in the marketplace.

While participating in AHC-facilitated meetings members must take care to not do anything which may result in a breach of the Act.

Matters that may be particularly sensitive include:

- prices or the costs of supply;
- competition in relevant markets;
- collective dealings with regulators and others;
- decisions to deal or not deal with sales agents; or
- dealings with consumers;

Competition and Consumer Law compliance is important. If you have any concerns regarding the implications of any issue being discussed at any meeting, please bring the matter to the immediate attention of the Chair for the meeting.

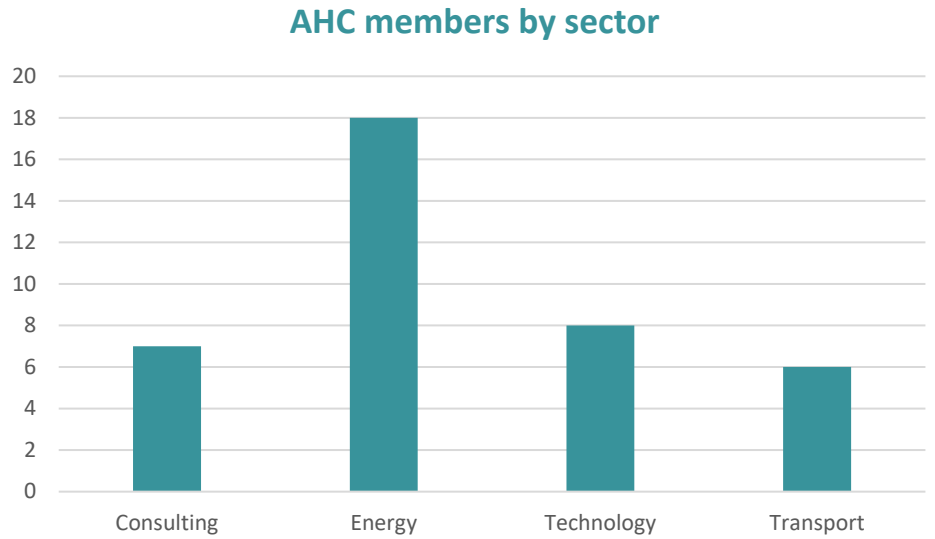
# CEO REPORT

FIONA SIMON

MAY 2020

# CEO UPDATE

- As of May 2020, AHC has 39 members
  - Half are in energy, with other main categories of technology, transport and consulting
- We welcome CS Energy, who joined last month
- We remain active and highly engaged
- Will provide an overview of:
  - COVID-19 survey
  - Government discussions
  - Membership and consortium opportunities
  - H2 under $2 work
  - Committee and Working Group overview






AUSTRALIAN HYDROGEN COUNCIL

# AHC MEMBER VIEWS ON COVID-19: SURVEY FINDINGS

FIONA SIMON

MAY 2020

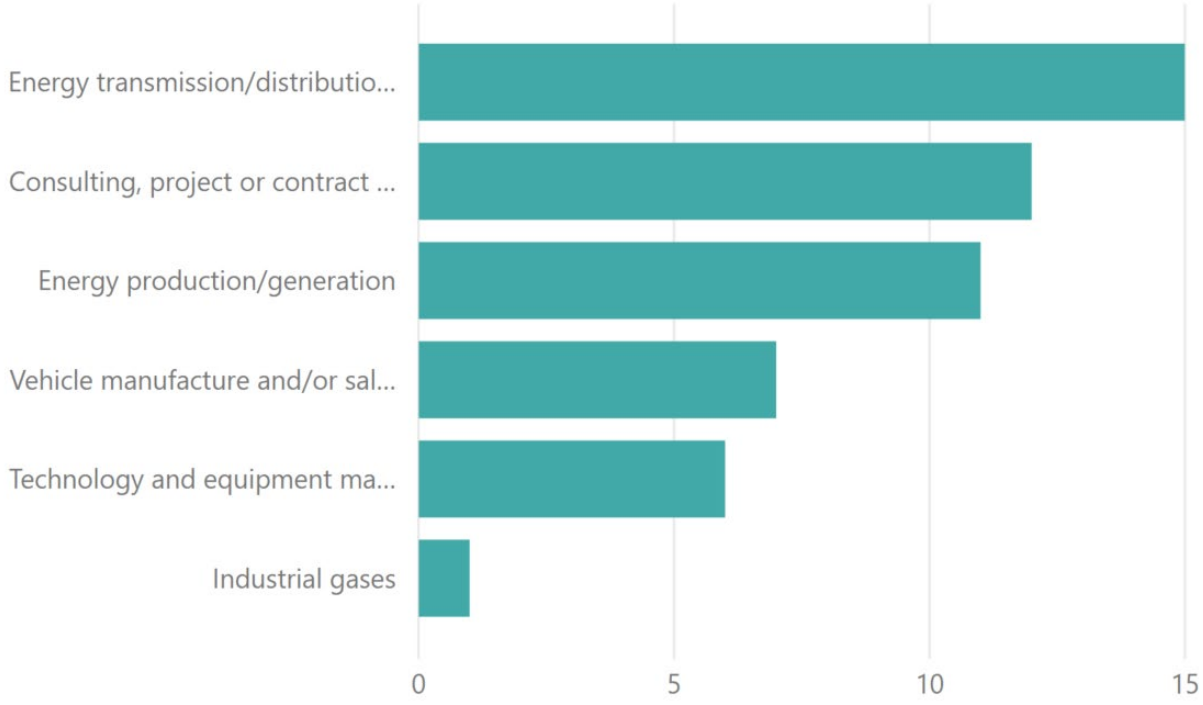
# AHC COVID-19 SURVEY RESULTS

## Survey takeaway

- Consistent with the membership breakdown, half of the people who responded are from energy (50%)
- Another 23% from consulting, project or contract management

| ANSWER CHOICES | RESPONSES | |
|---|---|---|
| Consulting, project or contract management | 23.08% | 12 |
| Vehicle manufacture and/or sales | 13.46% | 7 |
| Technology and equipment manufacture and/or sales | 11.54% | 6 |
| Energy production/generation | 21.15% | 11 |
| Energy transmission/distribution/storage | 28.85% | 15 |
| Energy sales | 0.00% | 0 |
| Industrial gases | 1.92% | 1 |
| Mining | 0.00% | 0 |
| TOTAL | | 52 |

*Q1: What is your company's core business? Pick the choice that most closely reflects your business. Please note that 'energy' refers to electricity, natural gas, and liquid fuels.*



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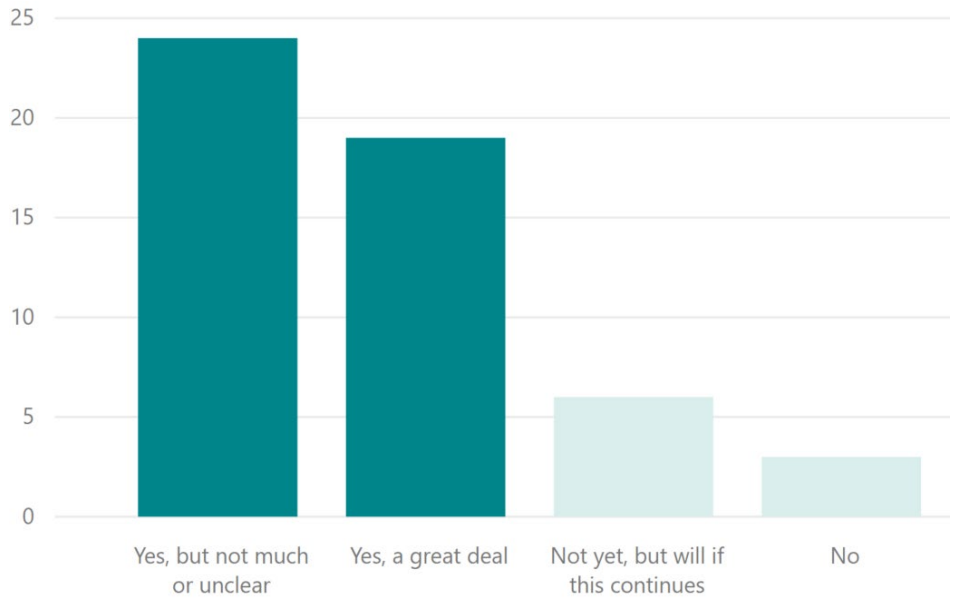
# AHC COVID-19 SURVEY RESULTS

## Survey takeaway

- 83% of respondents (43) said their business is affected by COVID-19
- Just under half of these say their business is affected a great deal

*Q2: Is your business currently being negatively affected by COVID-19?*




| ANSWER CHOICES | RESPONSES | |
|---|---|---|
| No | 5.77% | 3 |
| Not yet, but will if this continues | 11.54% | 6 |
| Yes, but not much or unclear | 46.15% | 24 |
| Yes, a great deal | 36.54% | 19 |
| Not sure | 0.00% | 0 |
| TOTAL | | 52 |



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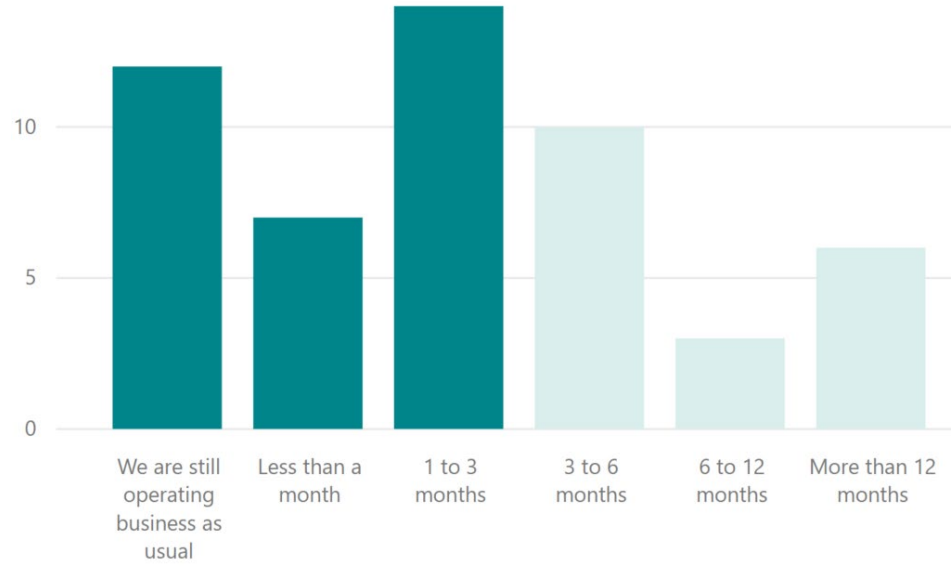
# AHC COVID-19 SURVEY RESULTS

## Survey takeaway

- 63% of respondents (33) said their business would be back to pre-COVID status within 3 months
- But almost 12% estimate over 12 months to recover

*Q3: If COVID-19 were to end today, how long would you estimate it would take for your business to get back to business as usual?*




| ANSWER CHOICES | RESPONSES | |
|---|---|---|
| Still BAU | 23.08% | 12 |
| Less than a month | 13.46% | 7 |
| 1 to 3 months | 26.92% | 14 |
| 3 to 6 months | 19.23% | 10 |
| 6 to 12 months | 5.77% | 3 |
| More than 12 months | 11.54% | 6 |
| TOTAL | | 52 |



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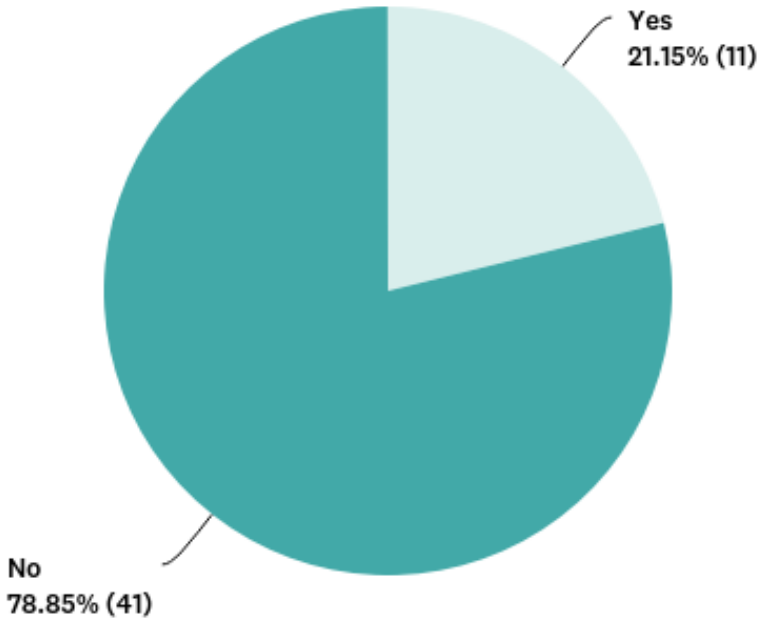
# AHC COVID-19 SURVEY RESULTS

## Survey takeaway

- Almost 80% of respondents advised that their hydrogen strategy has not been affected by COVID-19
- This is despite the effects of COVID-19 on their business overall

*Q4: Is COVID-19 negatively affecting your hydrogen strategy?*



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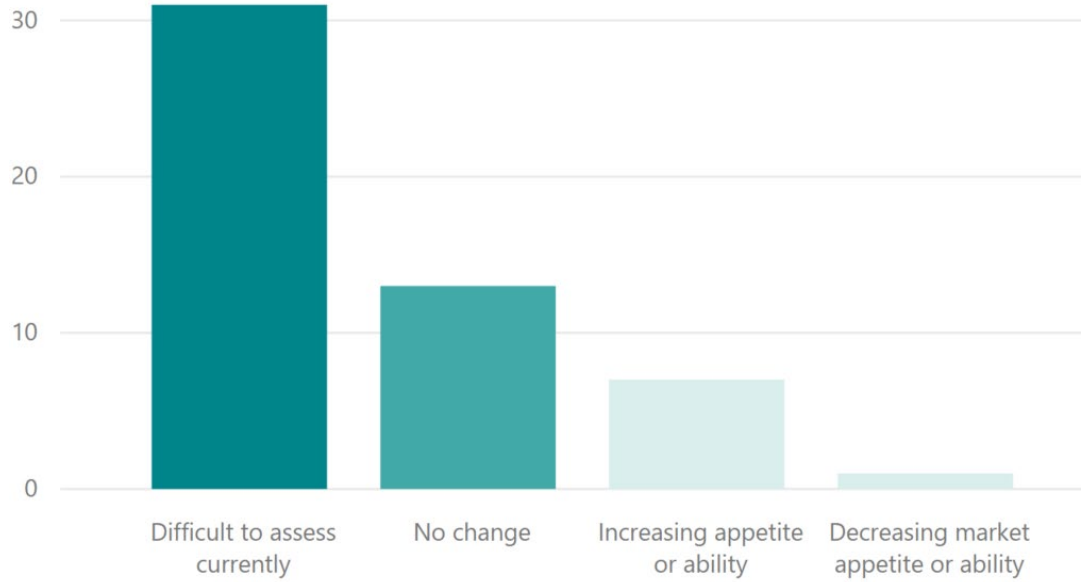
# AHC COVID-19 SURVEY RESULTS

## Survey takeaway

- A negligible number of respondents said their capacity to deliver current hydrogen projects had reduced
- But 60% of respondents did say it was difficult to assess
- A quarter of respondents advised there was no change to their capacity to deliver current hydrogen projects

*Q5: How is COVID-19 affecting your capacity to deliver current hydrogen projects?*



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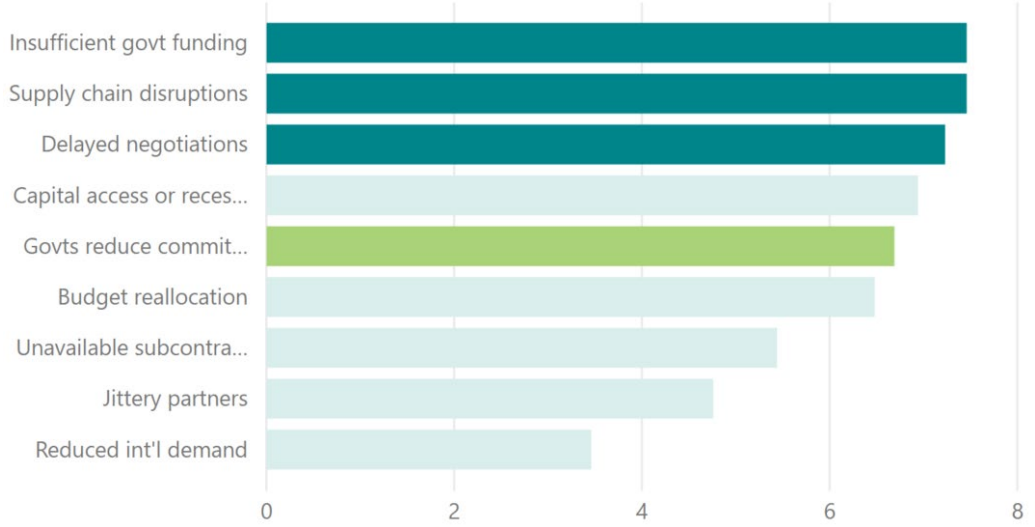
# AHC COVID-19 SURVEY RESULTS

## Survey takeaway

- Respondents were asked to rank their top 3 concerns from a list
- On a weighted basis, the top concerns related to government funding and business matters with contract negotiations and supply disruptions
- Respondents were also concerned about governments reducing their commitment to hydrogen
- Most respondents (87%) reported their concerns about their top three issues had increased compared with pre-COVID-19, with 78% of these having somewhat higher concerns
- Looking at just the top concern by core business, it was the economy that was most concerning for all sectors

*Q6: What are your top 3 concerns with respect to COVID-19 and your hydrogen business?*



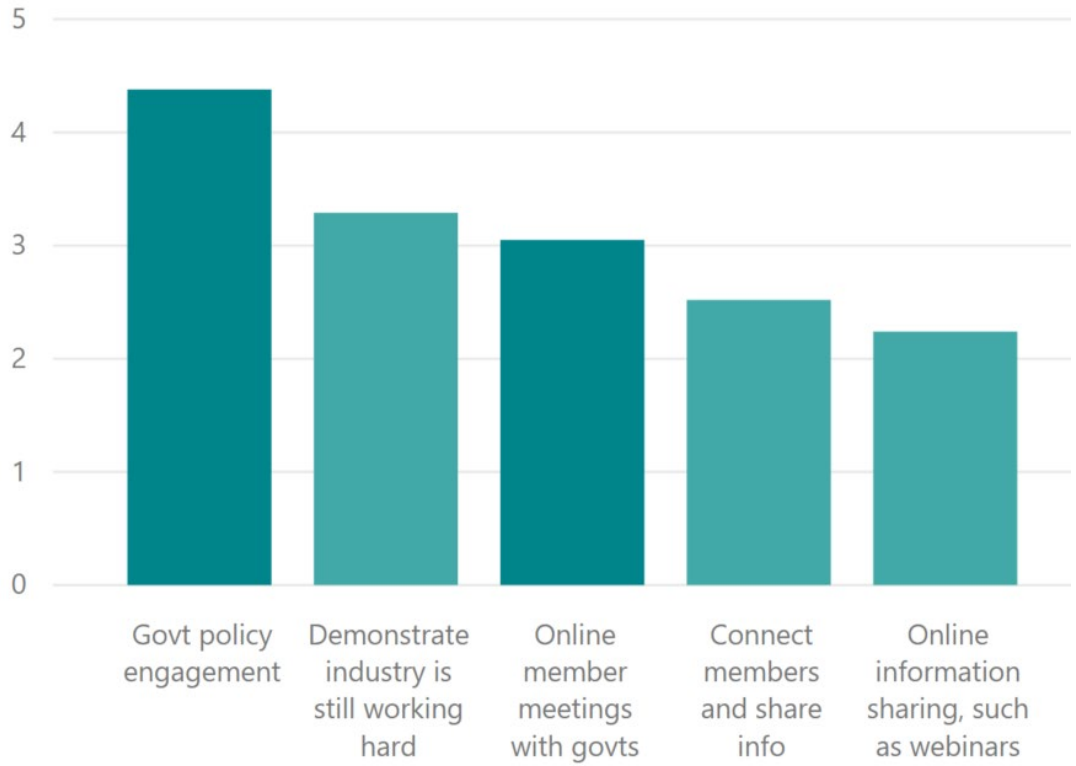

| Core Business | Top Concern | Top Concern Rating |
|---|---|---|
| Consulting, project or contract management | Capital access or recession | Somewhat higher |
| Energy production/generation | Supply chain disruptions | Somewhat higher |
| Energy transmission/distribution/storage | Supply chain disruptions | Somewhat higher |
| Industrial gases | Capital access or recession | Much higher |
| Technology and equipment manufacture and/or sales | Supply chain disruptions | Somewhat higher |
| Vehicle manufacture and/or sales | Capital access or recession | Somewhat higher |

# AHC COVID-19 SURVEY RESULTS

## Survey takeaway

- Respondents ranked engagement with governments on policy as the top AHC priority
- Combined with online meetings with governments (number 3 priority) we can see government engagement is the key activity
- It is also vital we communicate to our stakeholders that the industry is still working hard and open for business

*Q8: What should AHC prioritise to support your hydrogen business at this time? Please rank your responses where 1 is the most important action for AHC to take.*



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# GOVERNMENT UPDATE

FIONA SIMON

MAY 2020

# GOVERNMENT UPDATES

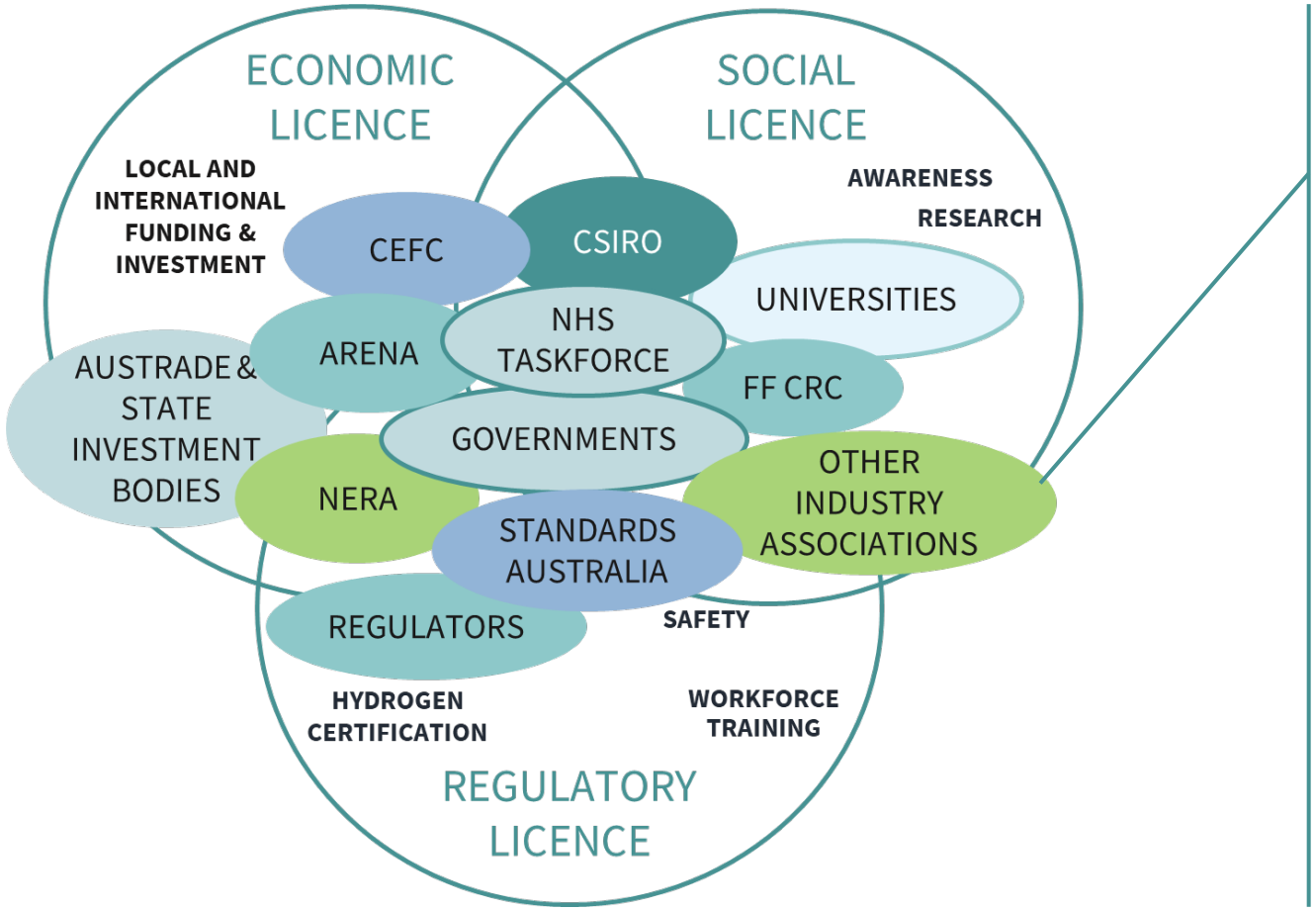
- NHS Project Team
- NSW
  - New hydrogen team – will hear from them today
  - Transport for NSW
- WA
  - Renewable Hydrogen Council
  - Projects
- Tasmania
- SA
- Victoria

# MEMBERSHIP AND CONSORTIUM OPPORTUNITIES

FIONA SIMON

MAY 2020

# ALLIANCES WITH OTHERS




## Developing relationships…

**International**

- New Zealand Hydrogen Association
- H2Korea
- Canadian Hydrogen and Fuel Cell Association
- Hydrogen Council

**Domestic**

- Clean Energy Council
- Energy Networks Australia
- Australian Pipelines and Gas Association
- Federal Chamber of Automotive Industries
- Truck Industry Council
- Australian Gas Association
- Bioenergy Australia
- Australian Logistics Council



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# ALLIANCES WITH OTHERS

- Heavy transport membership is missing
  - Trucks
  - Trains
  - Maritime
- Governments are looking for more
- What can we do?
  - Introductions, webinars
  - Transport government connections
  - Consortium?

# H2 UNDER 2

FIONA SIMON

MAY 2020

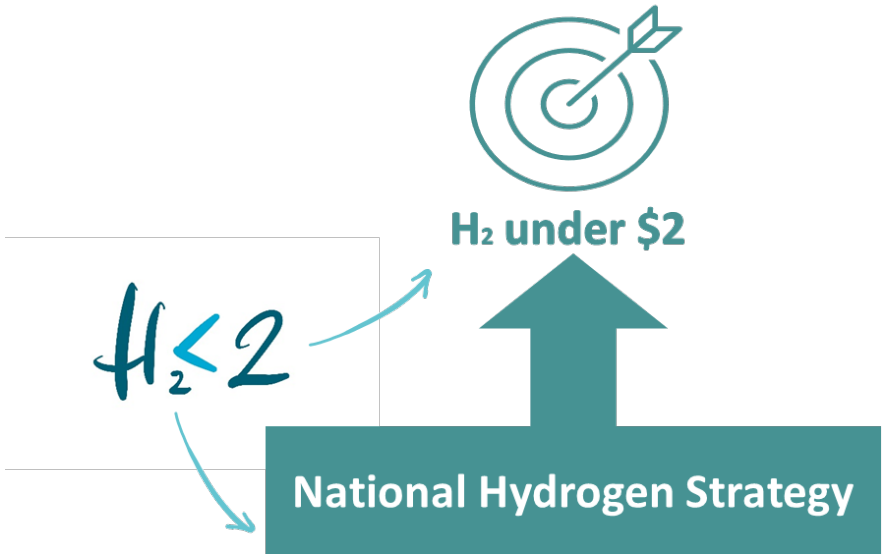
# CONTEXT

What we have:

- The NHS provides the foundation
  - With roles to play across governments and agencies/others
  - Significant goodwill across all parties
- 'H2 under $2' statement provides a goal
  - With potential support through the Technology Roadmap

What we need:

- Coordination and information sharing between the relevant parties
- Draft/suggested milestones to get to H2 under 2
- An explicit connection between the strategy and the goal




**The H2 under 2 Working group will assist…**

Objective is to provide a forum for information sharing and collaboration that:

- accelerates the adaptive pathway of the National Hydrogen Strategy and
- connects it to the H2 under 2 goal.



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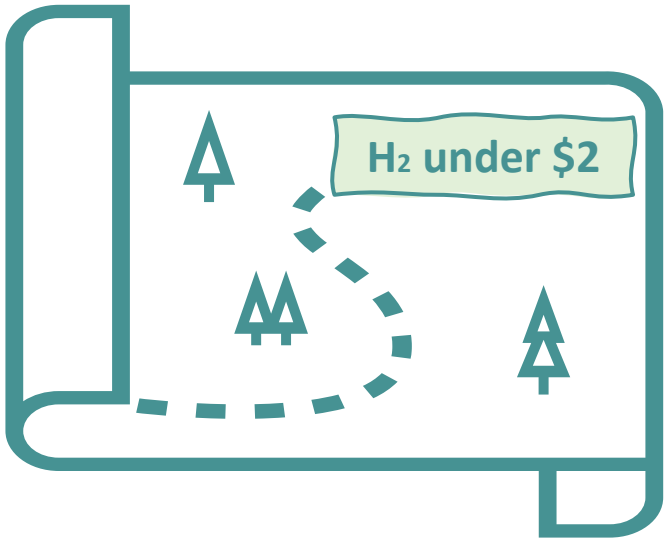
# PRELIMINARY TASKS

- Establish role as central collaborative forum that will engage with stakeholders– let people know we exist
- Share information
  - Map the boundaries of what members of the group are doing and establish relationships
  - Develop toolkit/directory on relevant organisations for use of group and states/territories
  - Develop information for international investors and support international collaboration



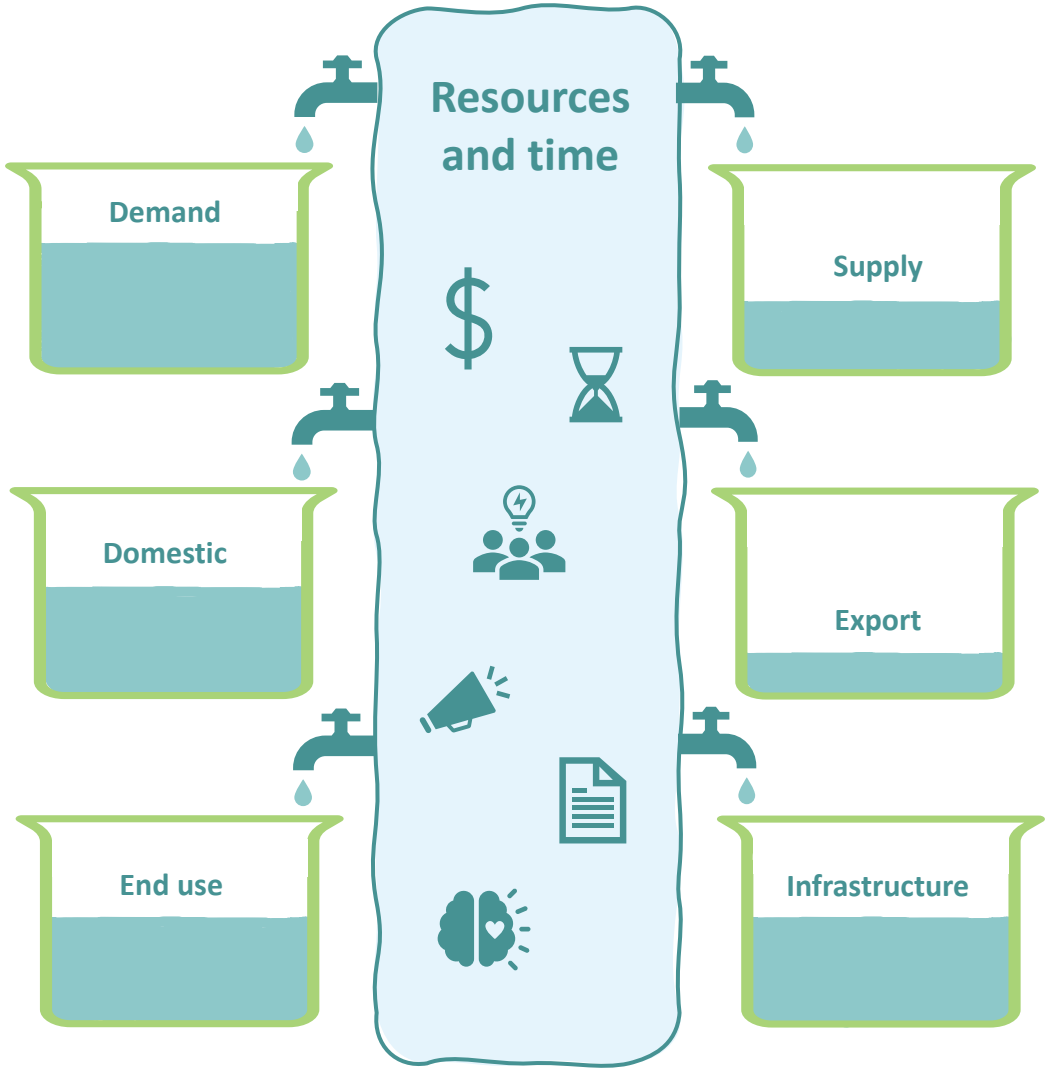

- Identify and map milestones to H2 under 2
  - Potentially for release but in the first instance to collaborate, coordinate views and findings and provide a further foundation for future Team Australia messaging where appropriate
- Identify and seek to resolve gaps and urgent matters (where a matter for collaboration)

# PRIORITIES: WHICH COMES FIRST?

Reasonable to prioritise demand – about offtake and aggregating through hubs to get supply going, links to jobs

Reasonable to prioritise domestic, connects to demand/offtake

Less for H2 under 2 work and more for investors/policy to support demand/domestic




Still keep an eye on supply to address preventable barriers and align with ARENA funding round

Still keep an eye on export from perspective of international investors and their needs



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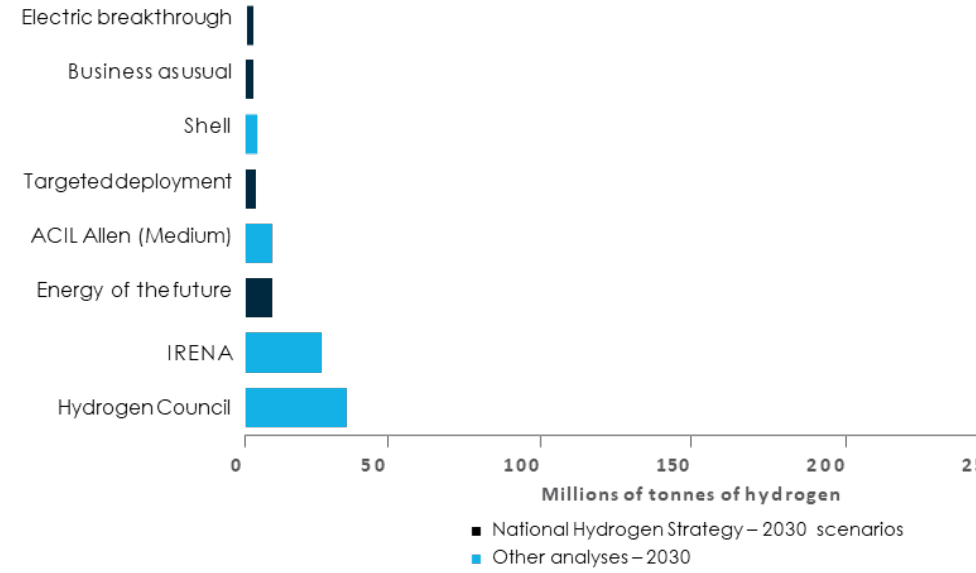
# AHC DRAFT EXPORT ROADMAP

- H2 under 2, or a production price of A$2/kg (excluding liquefaction, storage and shipping), will make Australian hydrogen exports competitive for the Asia-Pacific market
- We used the NHS *Targeted deployment* scenario to represent a minimum success case for the scale-up of the Australian hydrogen export industry
  - This scenario could see A$2/kg by 2040 but this is still optimistic
  - Even 2040 might be problematic: we note that Japan has stated it is seeking hydrogen at an equivalent of A$4/kg by 2030 and A$2/kg post-2030. Korea has proposed around A$1.7-2/kg by 2030
  - We note the figures don't account for margin
  - With the *Targeted deployment* scenario hydrogen exports should begin in 2025 and can scale up to approximately 6 million tonnes per annum by 2050
- To achieve a more ambitious (possibly exceptional) price of A$2/kg by 2030, Australia would need
  - To further accelerate commercial scale projects (>100 MW)
  - Extremely high levels of government funding
- Working on a domestic version – will combine; also funding cases for 2030 and 2040

Figure 2.2 Comparing 2030 global hydrogen demand growth estimates



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# AHC DRAFT EXPORT ROADMAP

| | 2020 | 2021 | 2022 | 2023-2024 | 2025 | 2030 | 2035 | 2040 | 2050 |
|---|---|---|---|---|---|---|---|---|---|
| | **Immediate next steps →** | | | **Early scale-up →** | | **Diversification →** | | **Maturing →** | **Industry mature** |
| **Key Outcomes** | Accelerate strategic deployment of funding for commercial scale blue and green hydrogen export projects (~100MW+ scale).<br>Incorporate commercial scale hydrogen projects into broader infrastructure programs intended to stimulate economic recovery.<br>Develop strategic priorities for the next 3-5 years based on export markets in Japan and Korea (see LNG industry experience).<br>Monetise Australian hydrogen technology and knowledge and build into relationships with offtakers. | | | Commercial scale projects ~100MW reach FID in 2023/2024 and construction commences.<br>10-100MW scale projects ready to export to Asia in 2025.<br>Cost to produce H2 reducing as a result of learnings from feasibility studies and commercial scale projects. | | Increasing efficiency gained from commercial scale export experience.<br>Growing volumes of H2 exported to Japan and Korea. New export markets emerge.<br>H2 from export used for diversifying domestic market end-use applications. | | Export industry in Australia growing and approaching maturity.<br>GW scale projects increase in number. | Export industry mature and at scale, like the LNG industry today.<br>Australia a global leader in H2 production. |
| **Export volume targets*** | 0.006 MT | 0.01 MT | 0.02 MT | 0.03-0.04 MT | 0.05 MT | 0.1 MT | 0.4 MT | 1.0 MT | 5.7 MT |
| **Export $ value milestones **** | N/A | N/A | N/A | N/A | A$400m p.a. | A$700m p.a. | A$1.1bn p.a. | A$2bn p.a. | A$11bn p.a. |
| **Hydrogen production scale-up milestones** | **Late-2020**: feasibility studies complete for 10-100MW green H2 electrolyser projects. Feasibility studies for first small to mid-scale blue H2 projects.*** | **Mid-2021**: FID taken on first 100MW scale electrolyser projects. FID taken on first small to mid-scale blue H2 projects.*** | **2022:** Feasibility studies begin for first 1GW scale projects. Feasibility studies begin on first large-scale blue H2 projects.*** | **2023/2024:** FID on first 1GW scale electrolyser projects. FID on first large-scale blue H2 projects.*** | **2025**: First 100MW electrolyser projects online and exporting to Asia.<br>First small to mid-scale blue H2 projects exporting to Asia. | **2030:** First 1GW scale projects online and exporting to Asia.<br>First large-scale blue H2 projects exporting to Asia. | **2035:** Expanding smaller and large-scale facilities to meet increasing demand in Asia. Australia a trusted H2 export partner. | **2040:** H2 export industry in Australia growing and approaching maturity. GW scale projects the norm. | **2050:** Export industry mature and at scale, similar to the maturity of the LNG industry. |
| **Funding milestones** | **Mid-2020**: ARENA $H_2$ funding allocated to kick-start feasibility studies and pre-FEED studies. | **Early 2021**: ARENA 2.0 (or alternative) legislation passed to fund renewable investment, with **A$1-2bn in H2 investment allocation**. | **Mid-2022**: ARENA 2.0 (or alternative) funds available. | | | | | | |

*NHS Deloitte *Targeted deployment* scenario
** Based on A$2/kg $H_2$ production price in 2040 and NHS *Targeted deployment* scenario export volumes
*** Using SMR + CCS/offsets

# COMMITTEE AND WORKING GROUP OVERVIEW

FIONA SIMON

MAY 2020

# NSW GOVERNMENT UPDATE

TIM STOCK, DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT

MAY 2020

# WORKING GROUP UPDATE: WG1 EXPORT MARKETS

FELICITY UNDERHILL AND DIANA RUSSELL COOTE

MAY 2020

# WG1: EXPORT MARKETS

| WG1 tasks |
| --- |
| 1. Work with government(s) to develop an international certification scheme that verifies and tracks:<br>- Production technology<br>- Carbon emissions associated with production (scope 1 and scope 2)<br>- Production location.<br>2. Support government work with bilateral partners to promote trade and investment in hydrogen. |

| Individual | Organisation |
| --- | --- |
| **Diana Russell-Coote** | **Woodside** |
| **Felicity Underhill** | **Origin Energy** |
| Fiona Simon | AHC |
| Ivan Byak | APA |
| Jamie Lowe | Engie |
| Luc Kox | Hazer |
| Martin Hablutzel | Siemens |
| Matthew Macleod | Toyota |
| Michael Salt | Arup |
| Neil Thompson | ITM Power |
| Richard Fechner | GHD |
| Sean Blythe | NGV/Nel |
| Katie Cook | WA Government |
| Kat Aleksoska | VIC Government |
| Michael Probert | NSW Government |
| Richard Day | SA Government |

# WORKING GROUP UPDATE: WG2 ENERGY REGULATORY REFORM

FIONA SIMON

MAY 2020

# WG2: ENERGY REGULATION AND POLICY REFORM

| WG2 tasks |
| --- |
| 1. Develop a view and advocate on possible changes to energy regulation and markets to support a merged gas and electricity objective (NECF) and flow on regulations/rules. |
| 2. Support ENA and APGA in all gas actions, including: |
| - Input to the review on clean hydrogen in gas networks by the end of 2020. |
| - Policy for gas networks and markets to allow widespread blending, and later sole use of hydrogen. |

- ENA and APGA are in the WG
- Seeking advice from members on regulatory impediments
- ENGIE has drafted material we will share:
  - *Sector coupling: the hydrogen economy and implications for gas and electricity markets*
  - *Note on ERF opportunities for Hydrogen projects*

| Individual | Organisation |
| --- | --- |
| **Fiona Simon** | **AHC** |
| David Dawson | Arup |
| Greg Simmons | Lochard Energy |
| Hugh Smith | ATCO |
| Jamie Lowe | Engie |
| John Cheong-Holdaway | Jemena |
| Lizzie O'Brien | GHD |
| Mendo Kundevski | Enea Consulting |
| Owen Sharpe | AGIG |
| Sarah Tincknell | Origin Energy |
| Dennis Van Puyvelde | ENA |
| Gabrielle Henry | VIC Govt |
| Andrew Robertson | APGA |

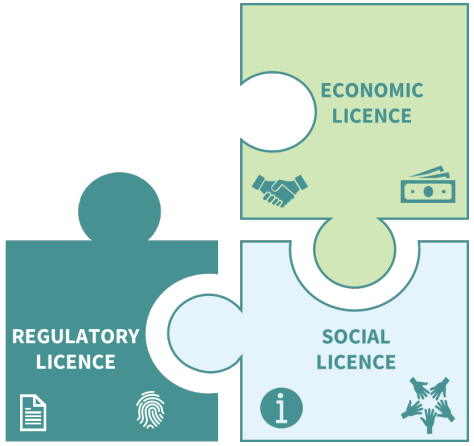
# WORKING GROUP UPDATE: WG3 SOCIAL LICENCE

FIONA SIMON

MAY 2020

# WG3: SOCIAL LICENCE

| WG3 tasks |
| --- |
| 1. Lead and design industry undertakings to guide the development of Australia's hydrogen industry. |
| 2. Support government work to develop a community education program to provide clear and accessible information about risks, benefits and safe use. |
| 3. Support government work to consider the role of hydrogen in supporting Australian energy security by 2025. |




- Group has met once, involved people outside the membership as well
  - Still unclear where to start with an undertaking
  - Many people in this space
  - Information sharing isn't there yet

| Individual | Organisation |
| --- | --- |
| **Fiona Simon** | **AHC** |
| Brooke Maki | GHD |
| Donna McDowall | Quanta Services |
| John Cheong-Holdaway | Jemena |
| Kapz Malhotra | ATCO |
| Kellie Charlesworth | Arup |
| Mendo Kundevski | Enea Consulting |
| Olivia Mahon | Toyota |
| Owen Sharpe | AGIG |
| Sandra Lau | Viva Energy |
| Sarah Tincknell | Origin Energy |
| Peta Ashworth | UQ |
| David Norman | FFCRC |
| Justine Lacey | CSIRO |
| Michael Probert | NSW Government |
| Gabrielle Henry | VIC Government |
| Kathy Witt | UQ |

# WG3: SOCIAL LICENCE

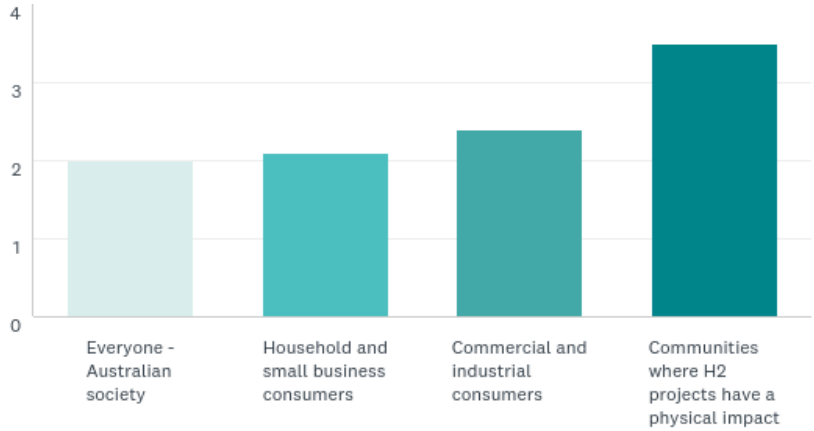
- So we sought direction from a survey
  - 10 respondents across the sectors
- Useful in confirming plural views on priorities!
- Only consensus: 9/10 people said we needed the undertaking in 2021

*Q1: First we should frame the project - which of the below best reflects your view of the main purpose of the industry undertaking(s)?*


*Q2: In your view, where are we best to start?*

| ANSWER CHOICES | RESPONSES | |
|---|---|---|
| Top down - broad principles that we can then modify and supplement with detail for different circumstances. | 30.00% | 3 |
| Bottom up - Focussed statements/work to support particular uses/projects, that we can duplicate and grow to other circumstances. | 50.00% | 5 |
| Both (answers from 'need further work') | 20.00% | 2 |
| TOTAL | | 10 |

*Q3: Who should we be developing this for in the first instance? Please rank your response where 1 is the first priority for the undertaking(s).*



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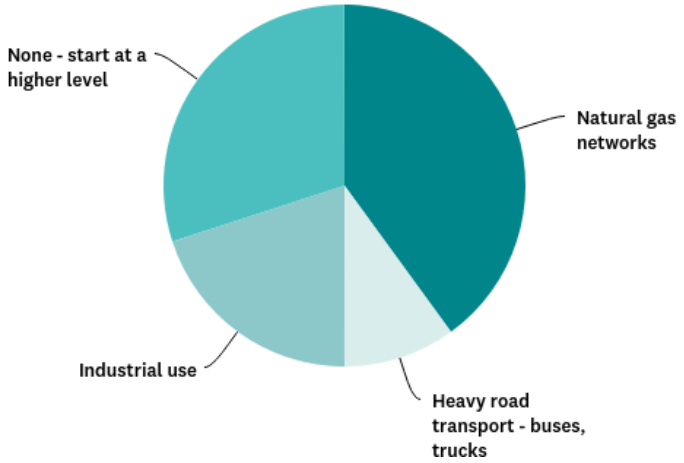
# WG3: SOCIAL LICENCE

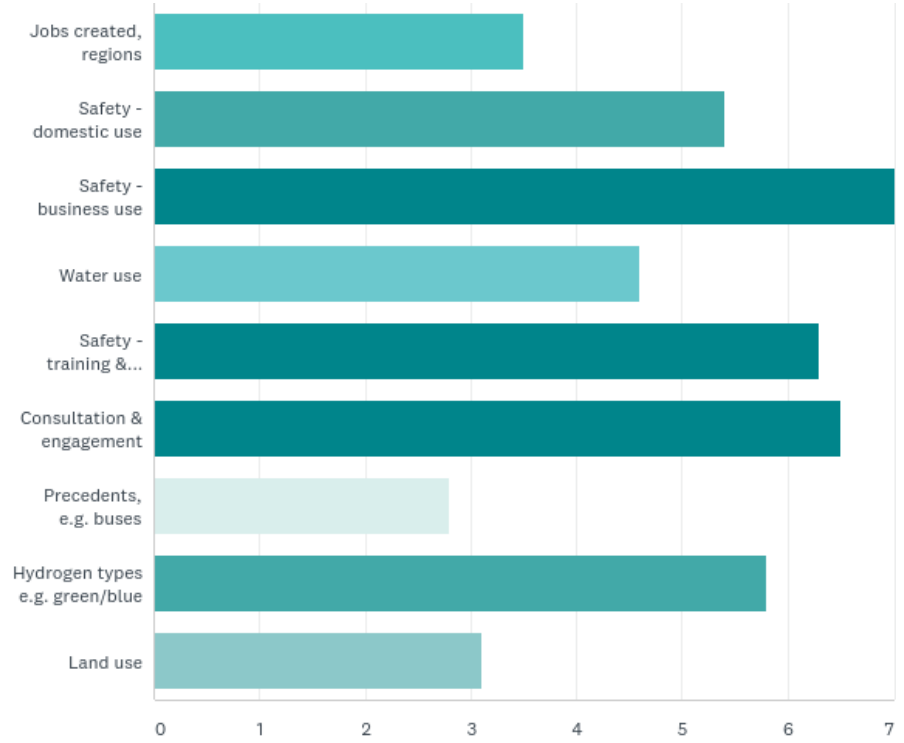
*Q4: Which part of the emerging hydrogen industry represents the best opportunity for an undertaking?*




*Q8: To what degree should the initial undertaking(s) codify expectations?*

| ANSWER CHOICES | RESPONSES | |
|---|---|---|
| None at all - this is about principles only | 30.00% | 3 |
| A great deal - there should be a way of measuring compliance | 10.00% | 1 |
| To a moderate degree - need 'teeth' while maintaining flexibility | 60.00% | 6 |
| Other (please specify) | 0.00% | 0 |
| TOTAL | | 10 |

*Q5: Please rank the order of topics to be addressed in the undertaking(s), from 1-9, where 1 is the most important topic to be addressed, whether this is for negative or positive reasons.*






AUSTRALIAN HYDROGEN COUNCIL

# WG3: SOCIAL LICENCE

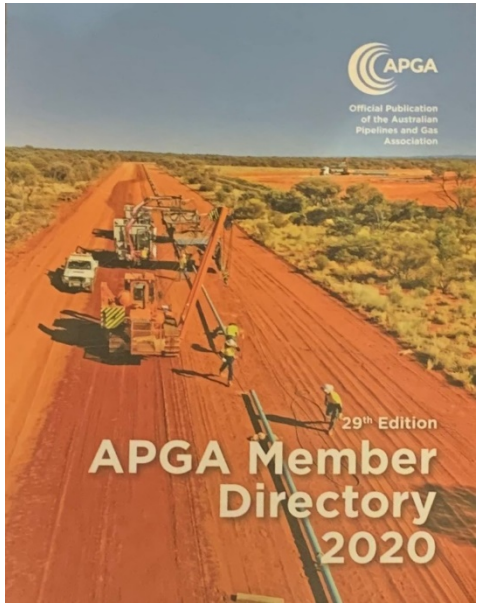
| Purpose of Industry Undertaking | Where to start | When we should consult | Audience | Count |
|---|---|---|---|---|
| Engagement | Top down and bottom up | Now - we need to discover stakeholder values before we start. | Commercial and industrial consumers (of energy, fuel, products) | 1 |
| Engagement | Bottom up | When we have some draft options, so we can test people's preferences. | Communities where hydrogen projects will have a physical impact | 1 |
| Engagement | Top down and bottom up | When we have some draft options, so we can test people's preferences. | Everyone - Australian society | 1 |
| Risk management | Bottom up | Now - we need to discover stakeholder values before we start. | Communities where hydrogen projects will have a physical impact | 2 |
| Risk management | Bottom up | When we have some draft options, so we can test people's preferences. | Communities where hydrogen projects will have a physical impact | 1 |
| Risk management | Top down | When we have some draft options, so we can test people's preferences. | Communities where hydrogen projects will have a physical impact | 1 |
| Self-regulation | Bottom up | Now - we need to discover stakeholder values before we start. | Commercial and industrial consumers (of energy, fuel, products) | 1 |
| Self-regulation | Top down | Now - we need to discover stakeholder values before we start. | Everyone - Australian society | 1 |
| Self-regulation | Top down | Only once we have a well-developed draft. | Communities where hydrogen projects will have a physical impact | 1 |

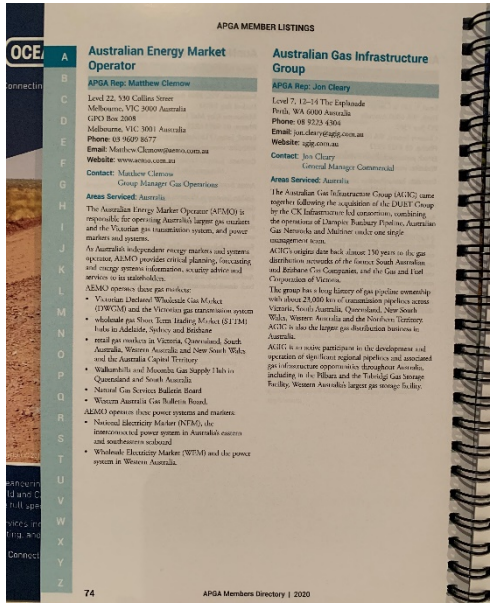
# OTHER BUSINESS

MAY 2020

# MEMBER DIRECTORY

- Purpose – to help members find one another
- Options
  - High level spreadsheet with sortable categories
  - More detailed spreadsheet with sortable categories
    - All relevant staff?
  - Formal publication in alphabetical order – marketing opportunities





APGA MEMBER LISTINGS

**Australian Energy Market Operator**

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Contact: Matthew Clemow
Group Manager Gas Operations

Areas Serviced: Australia

The Australian Energy Market Operator (AEMO) is responsible for operating Australia's largest gas markets and the Victorian gas transmission system, and power markets and systems.

As Australia's independent energy markets and systems operator, AEMO provides critical planning, forecasting and energy systems information, security advice and services to its stakeholders.

AEMO operates these gas markets:

- Victorian Declared Wholesale Gas Market (DWGM) and the Victorian gas transmission system
- wholesale gas Short Term Trading Market (STTM) hubs in Adelaide, Sydney and Brisbane
- retail gas markets in Victoria, Queensland, South Australia, Western Australia and New South Wales and the Australia Capital Territory
- Wallumbilla and Moomba Gas Supply Hub in Queensland and South Australia
- National Gas Services Bulletin Board
- Western Australia Gas Bulletin Board.

AEMO operates these power systems and markets:

- National electricity Market (NEM), the interconnected power system in Australia's eastern and southeastern seaboard
- Wholesale Electricity Market (WEM) and the power system in Western Australia.

**Australian Gas Infrastructure Group**

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Areas Serviced: Australia

The Australian Gas Infrastructure Group (AGIG) came together following the acquisition of the DUET Group by the CK Infrastructure led consortium, combining the operations of Dampier Bunbury Pipeline, Australian Gas Networks and Multinet under one single management team.

AGIG's origins date back almost 150 years to the gas distribution networks of the former South Australian and Brisbane Gas Companies, and the Gas and Fuel Corporation of Victoria.

The group has a long history of gas pipeline ownership with about 25,000 km of transmission pipelines across Victoria, South Australia, Queensland, New South Wales, Western Australia and the Northern Territory. AGIG is also the largest gas distribution business in Australia.

AGIG is a active participant in the development and operation of significant regional pipelines and associated gas infrastructure opportunities throughout Australia, including in the Pilbara and the Tubridgi Gas Storage facility, Western Australia's largest gas storage facility.



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| Woodside | Energy | Oil & gas exploration/production | Glen Bowman | Glen.Bowman@woodside.com.au |

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| Air Liquide | M | Business | Gases | Industrial/chemical gas supply & equipment | Francois ABRIAL | Asia Pacific Hub Executive Vice President | francois.abrial@airliquide.com | T: +6563785221 | Singapore | No 2 Venture Drive, #22-28 Vision Exchange, 608526, Singapore | |
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AUSTRALIAN HYDROGEN COUNCIL

# MEMBER DIRECTORY

| Organisation name | Address | Contact person | Email address | Website | Areas serviced | Description of services |
|---|---|---|---|---|---|---|
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# CLOSE

## AHC contact

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