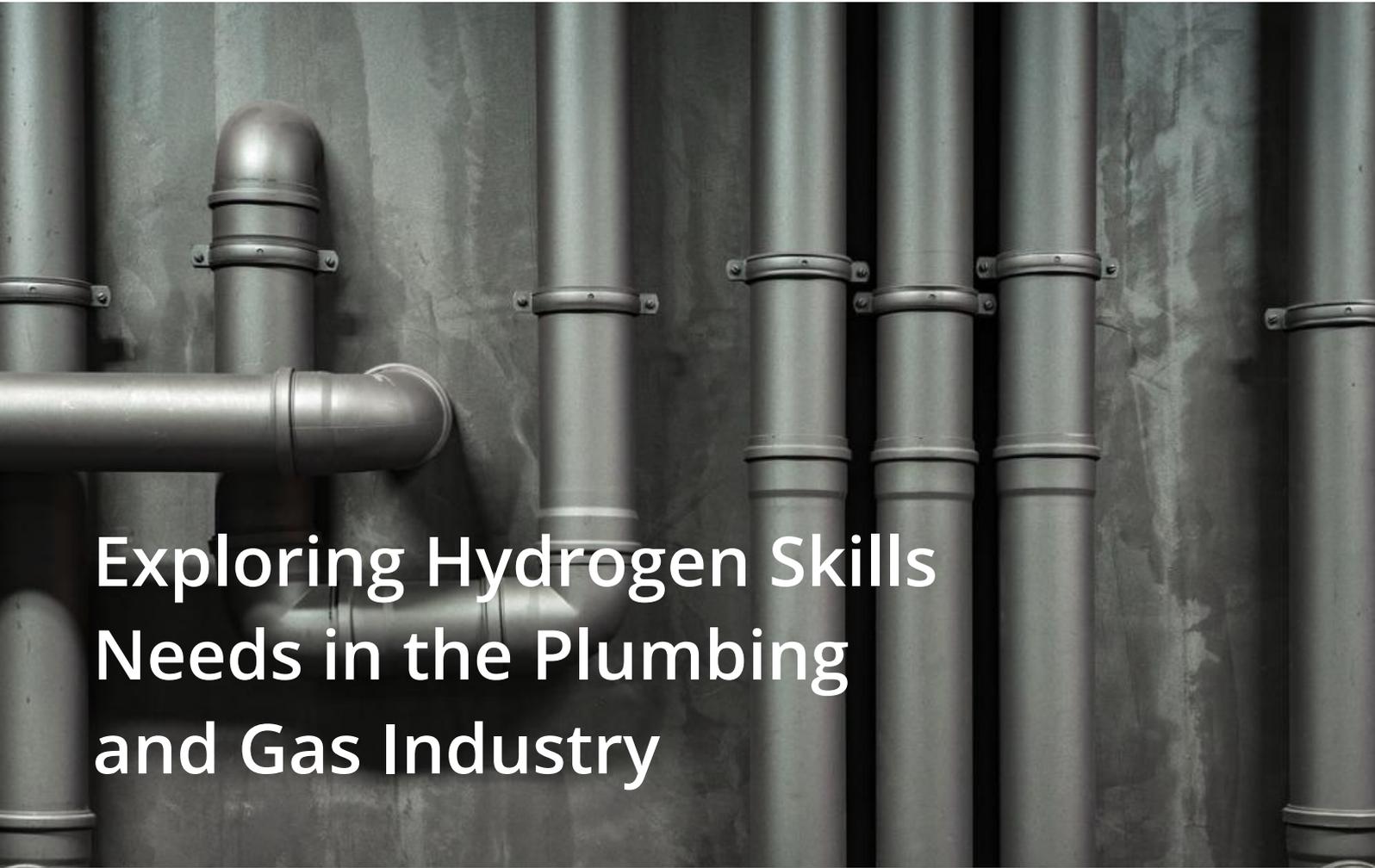


artibus INNOVATION

Developing industry skills



Exploring Hydrogen Skills Needs in the Plumbing and Gas Industry

Discussion Paper for the Hydrogen Project Case for Change

Submitted by Artibus Innovation on behalf of the
Construction, Plumbing and Services Industry Reference
Committee.

May 2021

Artibus Innovation

Artibus Innovation is the Skills Service Organisation supporting the Industry Reference Committees (IRCs) for the Construction, Plumbing and Services, and Property Services sectors in Australia. It develops, manages, and supports nationally endorsed Training Packages.

The IRCs are responsible for providing guidance, direction, and advice in relation to the workforce training and skills development needs of these two industry sectors. Together, industry, employees and enterprises contribute significantly to Australia's infrastructure, underpinning the nation's economic and social fabric.

Acknowledgement of Support

We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past, present and emerging.

Artibus Innovation acknowledges the financial support received by the Commonwealth to operate as a Skills Service Organisation. Artibus Innovation does not represent industry, the Commonwealth, or the Department of Education, Skills and Employment.



Australian Government

**Department of Education,
Skills and Employment**

The purpose of the Discussion Paper

This Discussion Paper supports the development of a **Case for Change** ('Case'). This Case will put forward industry evidence to develop new hydrogen-based units of competency that will support existing and new plumbing and gas technicians working with hydrogen.

The Construction, Plumbing and Services Industry Reference Committee (IRC) will present the Case to the Australian Industry and Skills Committee (AISC) to consider its approval.

As the Skills Service Organisation (SSO), Artibus Innovation supports the IRC connect with industry and hear the diverse voices of stakeholders across Australia on what skills requirements are needed to support the nation's hydrogen workforce development.

We will work closely with a cross section of industry stakeholders to ensure the units of competency are **industry-led** and fit for purpose.

Hydrogen and the vocational education and training (VET)

The renewable energy sector in Australia is growing rapidly and is providing many opportunities for the construction industry. **The plumbing industry will need to re-skill and up-skill its workforce to meet market demand.**

[Australia's National Hydrogen Strategy](#) ('the Strategy') was published in November 2019, it clearly sets out the nations visions for a '*clean, innovative and competitive hydrogen industry that benefits all Australians.*'

At the core of the Strategy lies the underpinning objective to have Australia be a major global player by 2030. The VET system will be a key enabler to ensure we have the right skills in the training system that support the needs of businesses across the nation.

The VET system is critical to the pipeline of skills Australian businesses need and can call on to drive job and economic growth.

Source: Australian Government, Department of Industry, Science, Energy and Resources: Australia's National Hydrogen Strategy.

The journey so far

An industry Working Group ('Group') has been established to provide both strategic and technical input on the project and unit development.

To date, the Group has identified **Skill Requirements** that address current skills and emerging gaps in the plumbing sector. These Skills Requirements have been translated into a proposed unit framework, which aims to support plumbing and gas training requirements.

Current skill gaps: To ensure current skill needs are met, 11 new hydrogen-based competencies are being put forward, which align with **traditional combustion** type of work.

Emerging skill gaps: To support emerging skills requirements, particularly around **fuel cell and electrolysis**, 8 new competencies are being proposed to ensure industry practitioners are 'work-ready' to meet future market needs.

Proposed Unit Framework

Outlined below is the Proposed Unit Framework. We are keen to hear views on whether:

- (1) the skills need identified reflect the needs of the industry, and
- (2) if there are other skills gaps or issues that need to be considered.

Traditional combustion stream	Fuel cell / electrolysis stream
<p>Purpose of stream: this stream is designed to build on traditional plumbing skills and knowledge.</p> <p>What it covers: safe handling of hydrogen, understanding the different pressures and levels of condensation, jointing techniques and threaded joints, cylinder requirements, different manufacture/product/certification requirements, commission and decommission of hydrogen-based appliances.</p>	<p>Purpose of stream: this stream is designed to be an additional non-traditional plumbing skill set to support industry practitioners meet emerging market needs and demands. It will have a domestic/residential focus. There is currently no competency requirements or training that cover this area of work.</p> <p>What it covers: emerging and predicted technology, purging against manufacture specifications, sizing and designing consumer piping, water treatment, wastewater management.</p>
1. CPCHYD3001 Store and handle hydrogen	1. CPCHYD3012 Commission and decommission hydrogen fuel cell and electrolyzers
2. CPCHYD3002 Install and commission for hydrogen Type A appliances	2. CPCHYD3013 Inspect, service and maintain hydrogen fuel cell and electrolyzers
3. CPCHYD3003 Maintain and service for hydrogen Type A appliances	3. CPCHYD4001 Undertake purging
4. CPCHYD3004 Disconnect and reconnect for hydrogen Type A appliances	4. CPCHYD4002 Size and design consumer hydrogen systems

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5. CPCHYD3005 Calculate and install ventilation for hydrogen Type A appliances	5. CPCHYD4003 Water treatment and wastewater
6. CPCHYD3006 Install and commission for hydrogen Type B appliances	6. CPCHYD4004 Size and design flue systems for hydrogen appliances
7. CPCHYD3007 Maintain and service for hydrogen Type B appliances	7. CPCHYD4005 Characteristic and chemistry of hydrogen
8. CPCHYD3008 Disconnect and reconnect for hydrogen Type B appliances	8. CPCHYD4006 Compression and cooling/chilling of hydrogen
9. CPCHYD3009 Safe termination of vent lines for hydrogen	
10. CPCHYD3010 Install hydrogen storage capacity up to xxxx (storage size to be determined).	
11. CPCHYD3011 Commission and decommission hydrogen combustion systems	

It is expected that the new hydrogen-based units of competency, once developed, will be incorporated into appropriate CPC Plumbing and Gas qualifications. It is also anticipated that the qualifications that will include the new units of competency will be updated through a minor release and not impact equivalency.

Have your say

These are the ways you can provide comment:

[National Hydrogen Feedback Survey](#) | [Participate in the webinar Q&A](#) (10 June 2021, 2pm- 2:45pm)

Consultation phase closes 17 June 2021.

Contact: manuel@artibus.com.au

Appendix A: Skill Requirements

Skills Requirements

Key Area 1: Skills coverage

New unit development needs to address required skills 'downstream of the meter' and end-user consumption.

New unit development will not duplicate existing outcomes.

Key Area 2: Unit development

We need to build units on the assumption of a 100% Hydrogen Fuel source. From a gas perspective, any blend over 90% presents a challenge for gas fitters. Competency development will need to recognise the difference between the 15% threshold of concentrated hydrogen fuel. (A blend of 15% and below provides no real difference, akin to ethanol/fuel mix in cars). Blends of over 15% presents the demand for training.

There is a need to consider building units on the skills model of LPG /natural Gas units consisting of:

- Installation – reference AS4564 and 5601
- Commissioning
- Servicing
- Maintenance
- Storage and Handling.

Need to consider existing units for suitability of a 100% Hydrogen source:

- Wastewater
- Filtration
- Backflow prevention
- Type A Gas units from a safety perspective
- Pipework, different pressure/mixtures.

Key Area 3: Existing gas networks

Introduction of hydrogen into gas pipelines and any new issues around of hydrogen in the training package needs to be considered.

Key Area 4: Licensing requirements and arrangements

Unit development will need to consider what and how hydrogen activity means to the sector and how it may be regulated (e.g., gas fitting).

Key Area 5: New technologies

It is understood that competency gaps are emerging and application of technology application across hydrogen competencies areas of new technology not yet covered but would require connection with plumbers.

The application of technologies will be important as new unit development is considered.

Skills Requirements

Key Area 6: AQF level appropriateness

New units should be appropriate for trade level delivery also build a post trade unit on Fuel Cell Installation, including purging to manufacturer's specifications.