PwC Consulting

A Roadmap to Building Workforce Capability

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19 October 2022

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Topics

- Introduction
- Workforce Capability - *the approach*
- Workforce Capability - *in practice*
- Questions & Answers

About me

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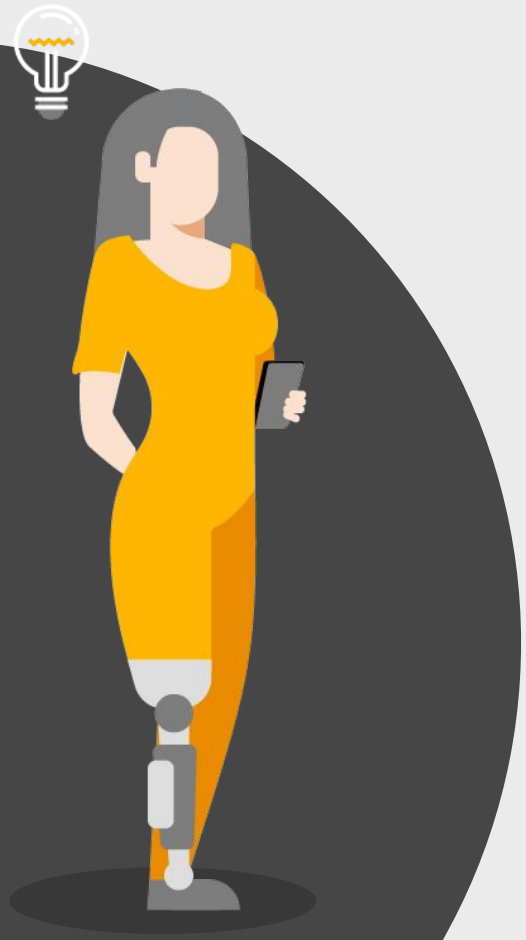
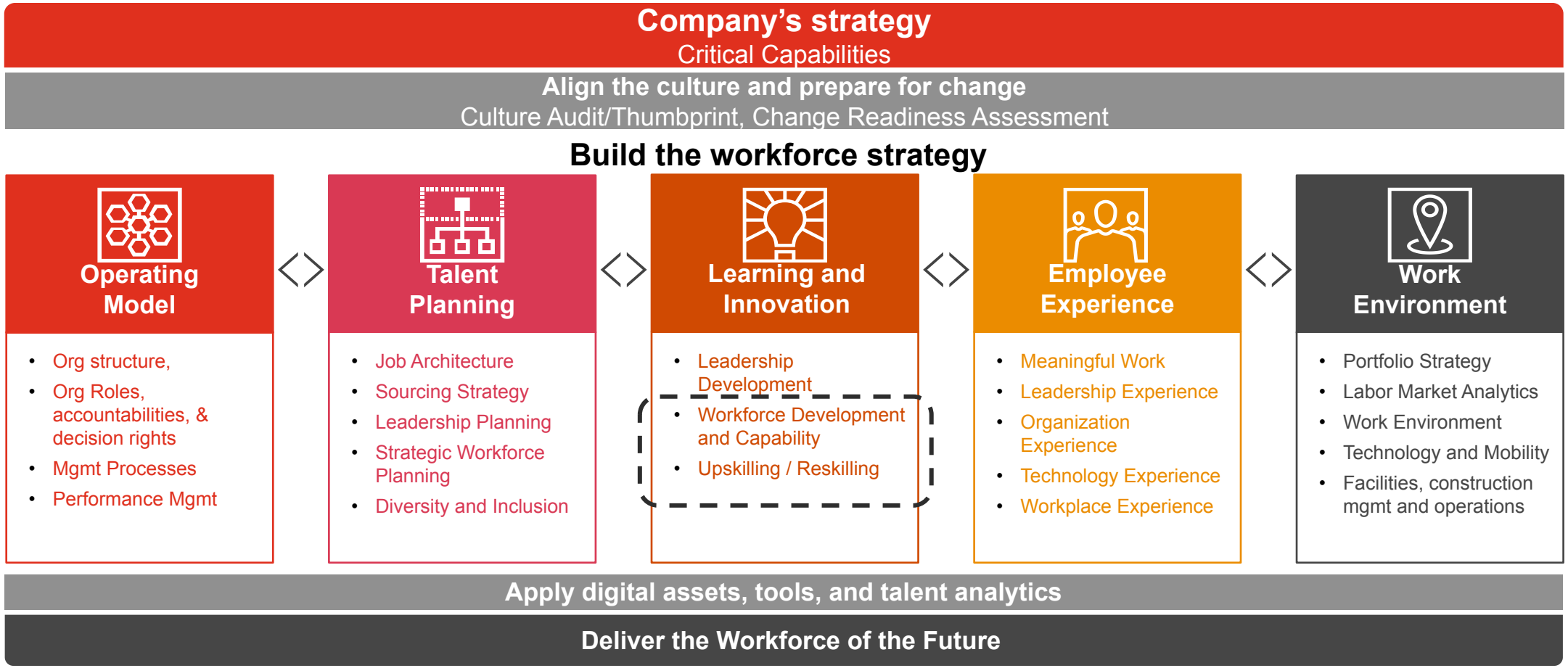


Workforce Capability - *The approach*

Workforce Capability is part of a much bigger workforce strategy framework



And there are a number of levers to pull for a successful workforce strategy

New talent pipelines

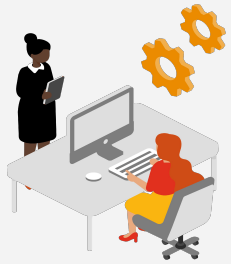
Growing the intake of the skilled workforce and optimising current employment models to attract and retain critical skills may be key to addressing longer term supply concerns

Expanding skilled migration to supplement workforce capacity

Competition and retention

Compelling and well defined employee value propositions tailored to workforce segments can attract, develop and retain talent

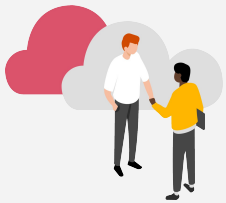
Early engagement of sectors affecting attraction and retention



Capability to leverage technology

New delivery models allow us to explore, update and adapt our workforce to new skills. Optimising the way we deliver services can create capacity and improve flow

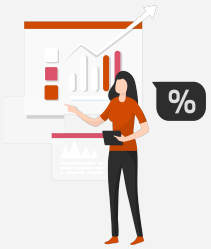
Broadening scope and upskilling the workforce to deliver more efficiently



Forecasting supply and shortage

An ageing workforce will see a high volume of retirements over the next 5-10 years,

Detailed, data driven insights to inform long term planning



Diversity to meet unique local needs

Diverse population and clients may require tailored models and a workforce that aligns with the unique needs of it's communities.

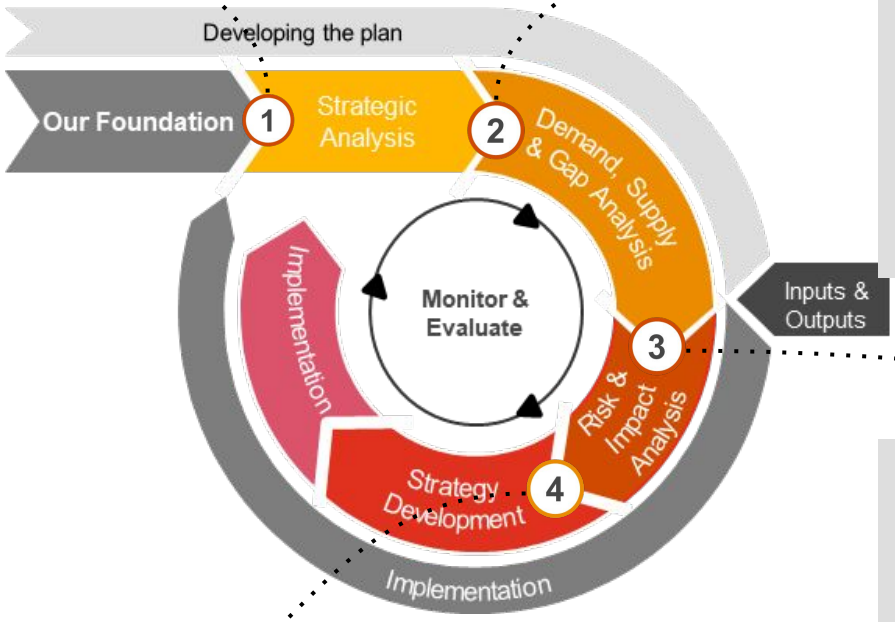
Partnering with communities for diverse outreach

Our approach to Workforce Capability is underpinned by a tried and tested approach

1.1 Project Mobilisation

1.2 Draft stakeholder Engagement Plan

1.3 Develop Research Plans



2.1 Draft Model Inputs

2.2 Initial Demand Mapping and Forecasts

2.3 Supply Assumptions

2.4 Conduct Demand, Supply and gap analysis

2.5 Refine Scenarios & Inputs

4.1 Plan Implementation Approach

4.2 Draft Strategic Plan

4.3 FInalise Strategic Plan

3.1 Long list Risk based on Gap analysis

3.2 Risk & Strategies Workshop

3.3 Strategy Development

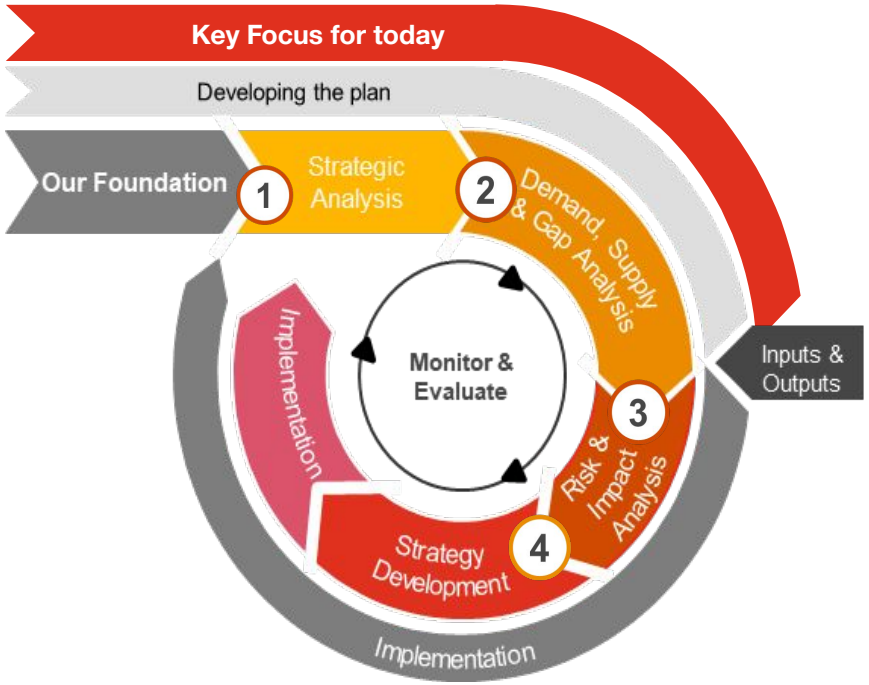
3.4 Strategy business case (Costs & Benefits)

3.5 Refine Strategy & assumptions

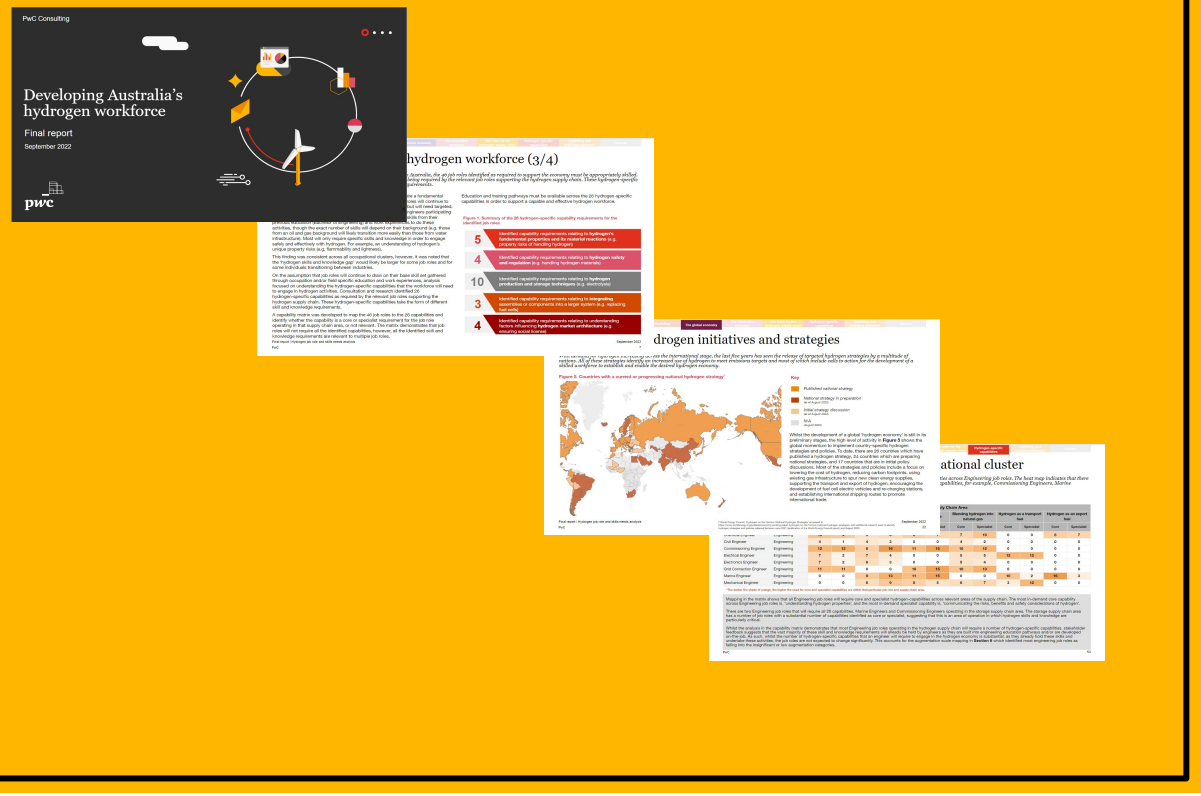
Workforce Capability - *In Practice*

A practical example from work in the Hydrogen Sector

We tailored our approach to address the **workforce capability requirements for Australia's Hydrogen workforce**



Case study: Developing Australia's hydrogen workforce



There was a clear scope to be addressed

The work addressed the **direct workforce requirements** within a **pre-defined value chain/supply chain** using local and global experience and expertise

The project sought to build an understanding of the workforce needed to support a safe and effective hydrogen economy in Australia across **six key supply chain** areas by 2030:

- *Production*
- *Blending into natural gas*
- *Storage*
- *Distribution*
- *As a transport fuel*
- *As an export fuel*

Data Sources

- CONSULTATIONS (DOMESTIC AND INTERNATIONAL.)
- DATA ANALYSIS
- LITERATURE REVIEW (DOMESTIC AND INTERNATIONAL.)
- SKILLS FRAMEWORKS AND TRAINING REVIEW

Strategic Questions for the plan

- What job roles are needed to support the hydrogen supply chain in Australia in 2030?
- Will these job roles fundamentally change in scope and skill requirements in order to engage in hydrogen activities? Or will they only be augmented?
- What capabilities will these job roles need to undertake hydrogen activities?
- Will any new job roles be required to support the hydrogen supply chain? E.g. job roles not currently in the economy.
- Are the hydrogen-specific capabilities required by the identified job roles catered for in the education and training system, or do training gaps exist?
- What will be the impact on the Australian education and training system of the hydrogen workforce? Can the system support a sufficient pipeline of skilled workers to enable the hydrogen economy?

The analysis was highly tailored

Given Hydrogen is a newly emerging/rapidly changing industry, the **following stages/steps where leveraged** to help develop an understanding of the workforce capability requirements. By applying these steps, our team **built an understanding of the workforce needed** to support a safe and effective hydrogen economy in Australia across six key supply chain areas **by 2030.**

Step 1: Job Roles
Consultation and research used to identify the job roles

Step 2: Hydrogen-Specific Capabilities
identify the **hydrogen-specific capabilities** required by the relevant job roles

Step 3: Capability Matrix
map the identified job roles to the hydrogen-specific capabilities,

Step 4: Existing training pathways
Mapping of hydrogen-specific capabilities against **existing training pathways** in Australia

Step 5: Job role forecasts
Quantitative research and analysis used to develop a model that **identified the number of jobs**

Step 6: Summary
Collation of outputs into **a synthesised view** of what the hydrogen workforce in Australia will look like in 2030 and the education and training system that will be needed to support and enable this workforce

Step 1: Identification of job roles

This analysis identified **46 job roles** across **6 occupational clusters.** No “new” job roles were identified as being required to support the hydrogen economy.

Extract from Cluster & Job Role Analysis

Job Roles	Supply Chain Area #1 Production	Supply Chain Area #2 Transport and distribution	Supply Chain Area #3 Storage	Supply Chain Area #4 Blending into gas networks	Supply Chain Area #5 Transport fuel	Supply Chain Area #6 Export fuel
Occupational Cluster: Specialists						
Fuel Cell Fabrication and Testing Technician	X		X	X		
Integration Specialist	X				X	
Loading Master						X
Power Production Plant Operator				X		
Technical Sales Representative						X
Water Treatment Plant Operator	X		X			
Occupational Cluster: Logistics						
Heavy Vehicle Operator		X			X	
Marine Master / Operator						X
Plant Machinery Operator					X	
Stevedore		X			X	X
Truck Driver		X			X	
Occupational Cluster: Management						

Step 2: Identification of hydrogen-specific capabilities

We identified **26 discrete hydrogen-specific capability requirements.** Job roles won't require all the identified capabilities, rather, it will depend on the area of the supply chain they are engaged in and the hydrogen activities being undertaken.

Extract from Capability Analysis

#	Statement of the capability	Definition
1	Understanding hydrogen properties	General knowledge of hydrogen's chemical properties, its forms, structure, volumetric and energy density, how it differs to other gases, how it interacts with other materials, and its property risks (including how it affects handling e.g. odourless, leaks quietly, rises quickly due to lightness).
2	Calibrating, testing and maintaining hydrogen equipment	The ability to monitor, measure and test maintenance equipment in a hydrogen process to ensure it is functioning properly (e.g. checking vessels for signs of fracture, cracks, leakage).
3	Handling cryogenic materials	The ability to use cryogenics or related systems to maintain hydrogen in a stable form for transportation.
4	Identifying hydrogen hazardous areas (safety & risk)	The ability to use cryogenics or related systems to maintain hydrogen in a stable form for transportation.
5	Understanding hydrogen market trends and drivers	The ability to use cryogenics or related systems to maintain hydrogen in a stable form for transpor
6	Knowledge of high pressure gas systems and vessels	The ability to use cryogenics or related systems to maintain hydrogen in a stable form for transpor
7	Fuel cells - Operating and maintaining fuel cells	The ability to use cryogenics or related systems to maintain hydrogen in a stable form
8	Fuel cell - Diagnosing and replacing fuel cells	The ability to use cryogenics or related systems to maintain hydrogen in a stable form for transportation.

Step 3: Capability matrix development

A capability matrix was developed to **map the capabilities to each of the 46 job roles**. This provides nsights about the frequency and distribution of different hydrogen-specific capabilities across job roles and supply chain areas.

Extract from Capability matrix

Occupational cluster that the relevant job role falls into

Hydrogen-specific capability

Identification that the particular job role does not need this capability in this supply chain area

Job Role	Cluster	Understanding hydrogen properties	Calibrating, testing and maintaining hydrogen equipment	Handling cryogenic materials	Identifying hydrogen hazardous areas	Interpreting hydrogen market trends and regulation	Knowledge of high pressure gas systems and vessels
Chemical Engineer	Engineering	C	C	N/A	C	N/A	C
Civil Engineer	Engineering	C	S	N/A	C	N/A	C
Commissioning Engineer	Engineering	C	C	S	C	C	C
Electrical Engineer	Engineering	C	C	N/A	C	N/A	C
Electronics Engineer	Engineering	C	C	N/A	N/A	N/A	C

Relevant job role

Flag that the capability has been identified as a core capability for the particular job role in this supply chain area

Indication that the job role is not relevant to the particular supply chain area

Flag that the capability has been identified as a specialist capability for the particular job role in this supply chain area

Step 4: Identification of training pathways and gaps

Mapping against existing accredited and non-accredited training pathways in Australia found only 15% (4/26) of the identified hydrogen-specific capabilities were deemed to have 'sufficient hydrogen training coverage'

Extract from Training Analysis

Sufficient hydrogen training coverage	Some hydrogen training coverage, but additional contextualisation or development required		Minimal/no hydrogen training coverage
Capability #2: Calibrating, testing and maintaining hydrogen equipment	*Capability #1:* Understanding hydrogen properties	*Capability #13:* Hydrogen storage techniques - Compressed hydrogen	*Capability #5:* Understanding hydrogen market trends and drivers
Capability #4: Identifying hydrogen hazardous areas	*Capability #3:* Handling cryogenic materials	*Capability #14:* Hydrogen storage techniques - Liquid hydrogen	*Capability #7*: Fuel cells - Operating and maintaining fuel cells
Capability #19: Oversight of control modules for hydrogen processes	*Capability #6:* Knowledge of high pressure gas systems and vessels	*Capability #15:* Hydrogen storage techniques - Conversion to hydrogen carriers	*Capability #8:* Fuel cell - Diagnosing and replacing fuel cells
Capability #21: Knowledge of power electronics	*Capability #9:* Reading and interpreting technical drawings with hydrogen equipment	*Capability #16:* Hydrogen production techniques - Electrolysis, biofuels, photolysis	*Capability #20:* Inspect, maintain and modify hydrogen vehicles
	Capability #10: Producing hydrogen - Understanding of cooling systems	*Capability #17:* Knowledge of conversion requirements for gases and their interchangeability	*Capability #23:* Recognition of hydrogen and waste product interchangeability in other industries
	Capability #11: Hydrogen production techniques - SMR (steam methane reforming)	*Capability #18:* Knowledge of hydrogen embrittlement	*Capability #24:* Integrating hydrogen equipment from various original equipment manufacturers (OEMs) into a process
	Capability #12: Hydrogen production techniques - Coal gasification	*Capability #22*: Managing hydrogen logistical movement across a supply chain	*Capability #25:* Understanding of co-firing in natural gas and hydrogen fuelled gas turbines
			Capability #26: Communicating the risks, benefits and safety considerations of hydrogen

Step 5: Quantification of job roles

Scaling the likely demand for different job roles, and skills training, is a critical activity to help drive implementation planning.

Scale of employment required

Job roles estimates have been undertaken for each occupational cluster in 2030 under three hydrogen production scenarios (low, medium or high megatonnes of hydrogen produced)

Some key drivers influencing the job role estimates include:

- **The in-demand supply chains in 2030**:
- **The job roles required in each scenario is influenced by the supply chain area maturity:**
- **The intensity of labour required**: T

Estimated number of jobs across each occupational cluster required to support the hydrogen economy in 2030 under a medium demand scenario

Engineers	2,750 - 3,400 jobs
Technicians and Tradespersons	7,900 - 9,650 jobs
Logistics	650 - 800 jobs
Management	900 - 1,050 jobs
Safety and Quality Control	800 - 950 jobs
Specialists	150 - 200 jobs
Total	**13,150 - 16,100 jobs**

There are some lessons from this work

There are always challenges that need to be addressed in undertaking detailed analysis. There were **a number of things we had to address** on this work

1	**Job role terminology:** Different job titles don't always reflect a new base job role. Multiple job titles can typically be mapped back to a common job role.
2	**Assessing scale of job role augmentation:** Changes to the day-to-day tasks and functions of a job role does not always equate to new skill needs. Job roles may already have the relevant skills to undertake new/different tasks.
3	**Building on an existing skill base:** Workers will have a range of skills and competencies relevant to new job roles and industries, and the focus should be on understanding the skills gap and undertaking gap training.
4	**Reviewing existing training pathways:** Consideration should be given to existing training pathways can the can be used to upskill/reskill workers. Some training will be fit for purpose, whilst others might need contextualisation.
5	**Consideration of analogous industries for building worker supply:** Analysis of workforce capabilities can be used to identify "like" industries and sectors that could be used as a source of workers with relevant skills.

Q&A

Want Further Information - PwC Contact Details

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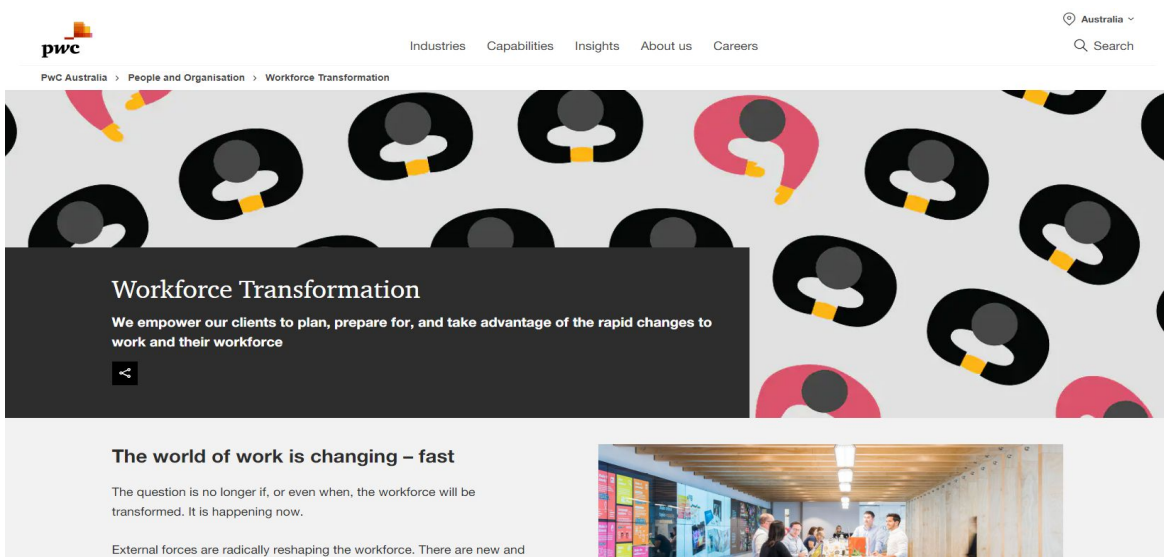

Thank you

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