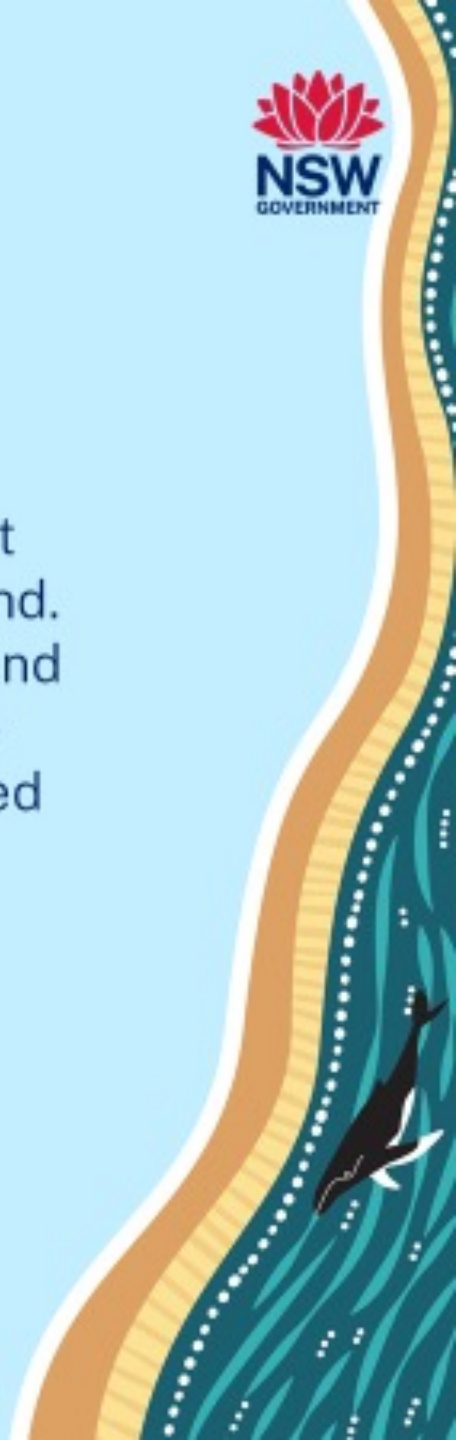
Port Kembla Hydrogen Hub

H2 TRAINING + SAFETY DAY #2

28 February 2023

NSW GOVERNMENT

The Department of Regional New South Wales acknowledges that it stands on Country which always was and always will be Aboriginal land. We acknowledge the Traditional Custodians of the land and waters, and we show our respect for Elders past, present and emerging. We are committed to providing places in which Aboriginal people are included socially, culturally and economically through thoughtful and collaborative approaches to our work.



H2 Training + Safety Day #2 Program

- 28 Feb 2023

2.00pm	Welcome + Intro	Nigel McKinnon Dept of Regional NSW
2.05pm	Coregas Refuelling Station - Update	Wodek Jakubik Coregas
2.10pm	Refuelling Station - Learnings	Scott Nargar Hyundai Australia
2.30pm	Hydrogen MicroSkills Training - Refuelling Hydrogen Vehicles	Chris Greentree TAFE NSW
2.55pm	Q & A	

This is a virtual event by MS Teams. Please forward the invite to anyone you think would benefit from attending.

Port Kembla Hydrogen Hub

H2 TRAINING + SAFETY DAY #1

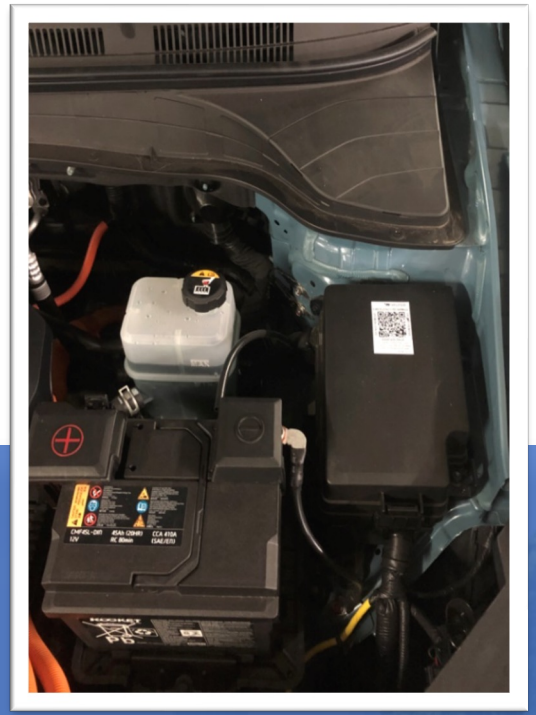
11 November 2021

NSW GOVERNMENT

Emergency Identification

Front Windscreen

Front Door B Pillars



Engine Bay

Number Plate

NSW 1st Sept 2019

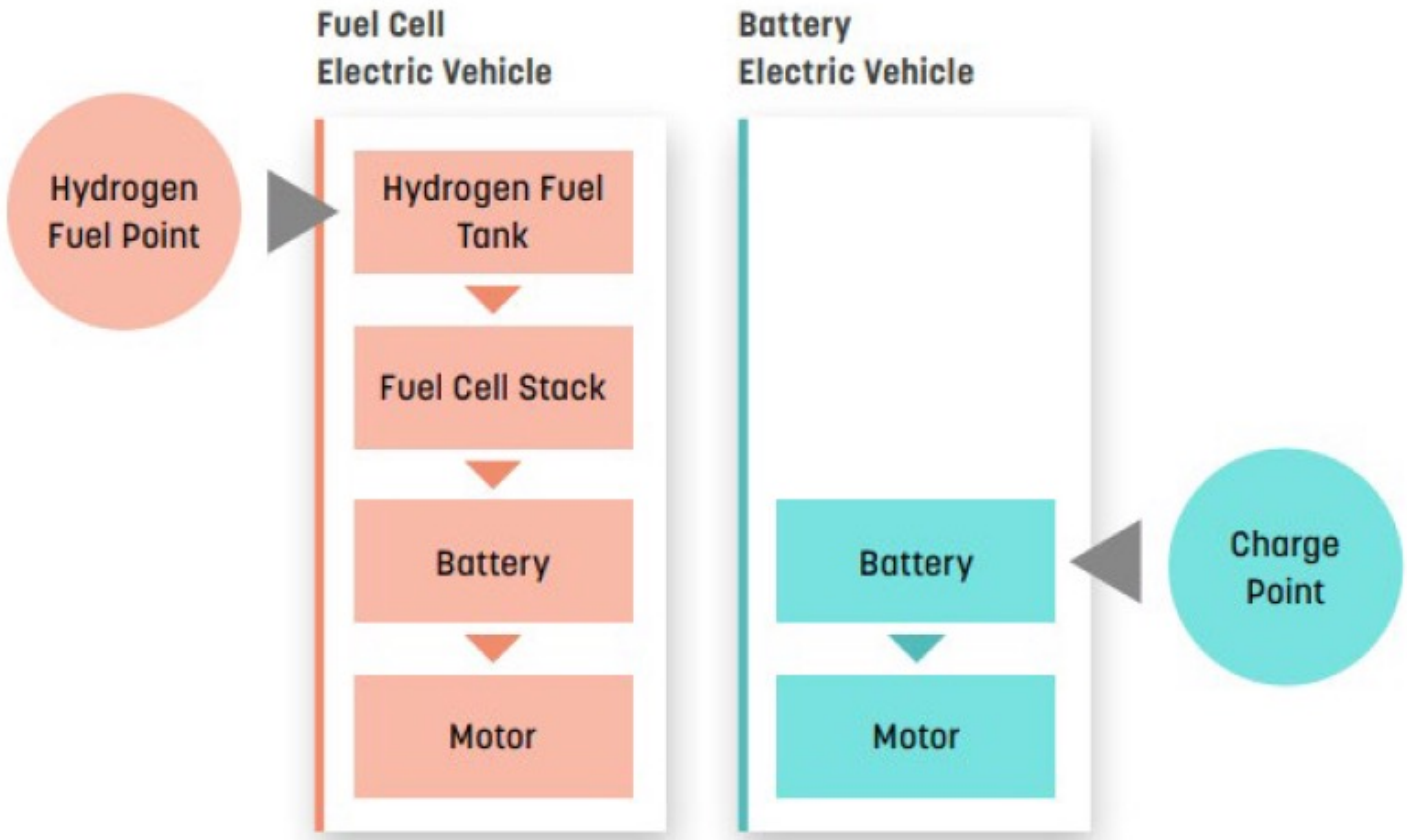
TAFE NSW ELECTRIC VEHICLE TRAINING SOLUTION

Released in October 2021, the TAFE NSW Electric Vehicle Solution will ensure that our future workforce will be ready for the transition of Electric Vehicles.

Our training products are stackable and ready for zero emission developments in light and heavy vehicles, mobile plant and equipment, and hydrogen fuel cell technology.

For more information, go to:

tafensw.edu.au/electric vehicles



COREGAS

HYDROGEN REFUELLING STATION

COREGAS HYDROGEN REFUELLING STATION

OWNER: Coregas

DESCRIPTION: Installation of a Hydrogen Refuelling Station adjacent to the existing Coregas Hydrogen Plant at Port Kembla. Project includes associated civil works for heavy vehicle access.

STATUS: Estimated to be operational by mid 2023.

TYPE: Hydrogen Refuelling Station featuring a Haskel Geno dispenser unit.

CAPACITY: 400kg/day of compressed fuel cell quality hydrogen at 350 bar (5,000 psi) pressure. Project is linked to heavy road transport trial with two fuel cell electric prime movers joining the Coregas NSW distribution fleet.

INVESTMENT: $2m estimate with NSW Govt (DRNSW) contribution of $500,000.

LOCATION: Port Kembla, Wollongong LGA.

CONTACT: Wodek Jakubik | 0409 227 209
wodek.jakubik@coregas.com

New South Wales Government AUSTRALIA

FUTURE OF MOBILITY

coregas

Coregas Port Kembla **refuelling station**

CAPACITY

400kg/day

approx. 10 vehicles

BACK TO BACK FILLING

10-15 minutes

DISPENSER

350 bar

coregas

How it will **come together**

Natural Gas

Bio-methane

SMR

Compression & Storage **200bar**

Refueller **500bar**

Coregas Fleet **350bar**

PARTNERS

HYZON

NSW GOVERNMENT | Regional NSW

MACQUARIE

Camlin

Haskel

FUTURE OF MOBILITY

Coregas' first **Hydrogen Prime Mover**

HYZON

HYZON HYMAX-450

H_2 powered 6x4 prime mover

Zero Emissions **Zero Compromise**

Powerful Performance
Highest power density fuel cell*

Quiet Operation
60% quieter than diesel equivalents

Quick Refuelling
Under 20 minutes

Long Range
650km on H_2 alone

High Payload
Ideal for heavy-duty vehicle application

Reduced Downtime
Less maintenance and servicing

*Independent tests show industry-leading power density

coregas

Transportation of cryogenic tankers and tube trailers

650km Round trip of Port Kembla

- Central Coast
- Canberra
- Hunter region

Climbing Mount Ousley

Scott Nargar

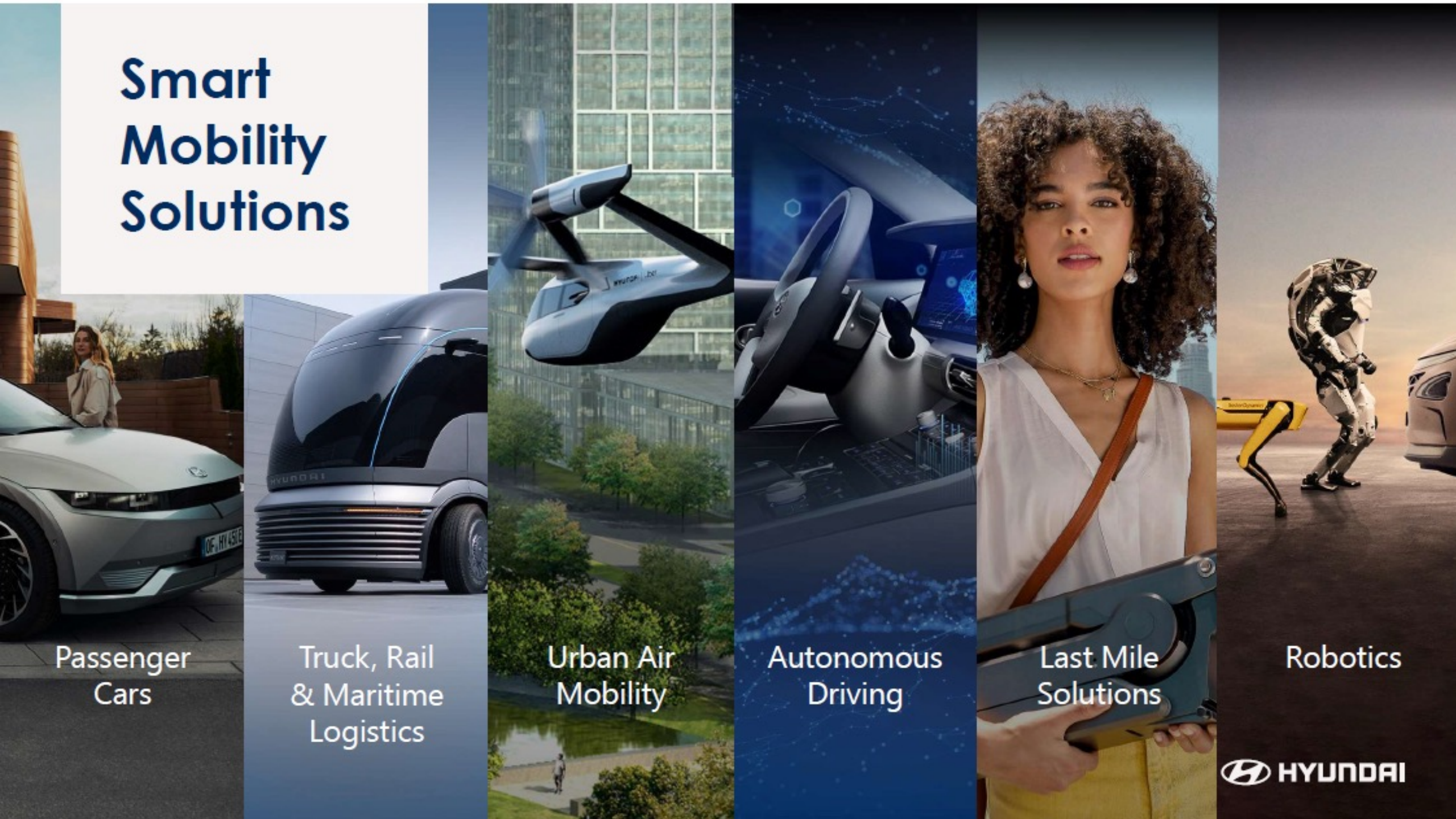
Senior Manager of Future Mobility &
Government Relations
Hyundai Motor Company Australia

HYUNDAI

Towards Carbon Neutral

HYUNDAI

Smart Mobility Solutions



Infrastructure is Core

to Success Implementation of New Technologies

H2 Station Learnings

Pressures

Capacity

Redundancy

Locations

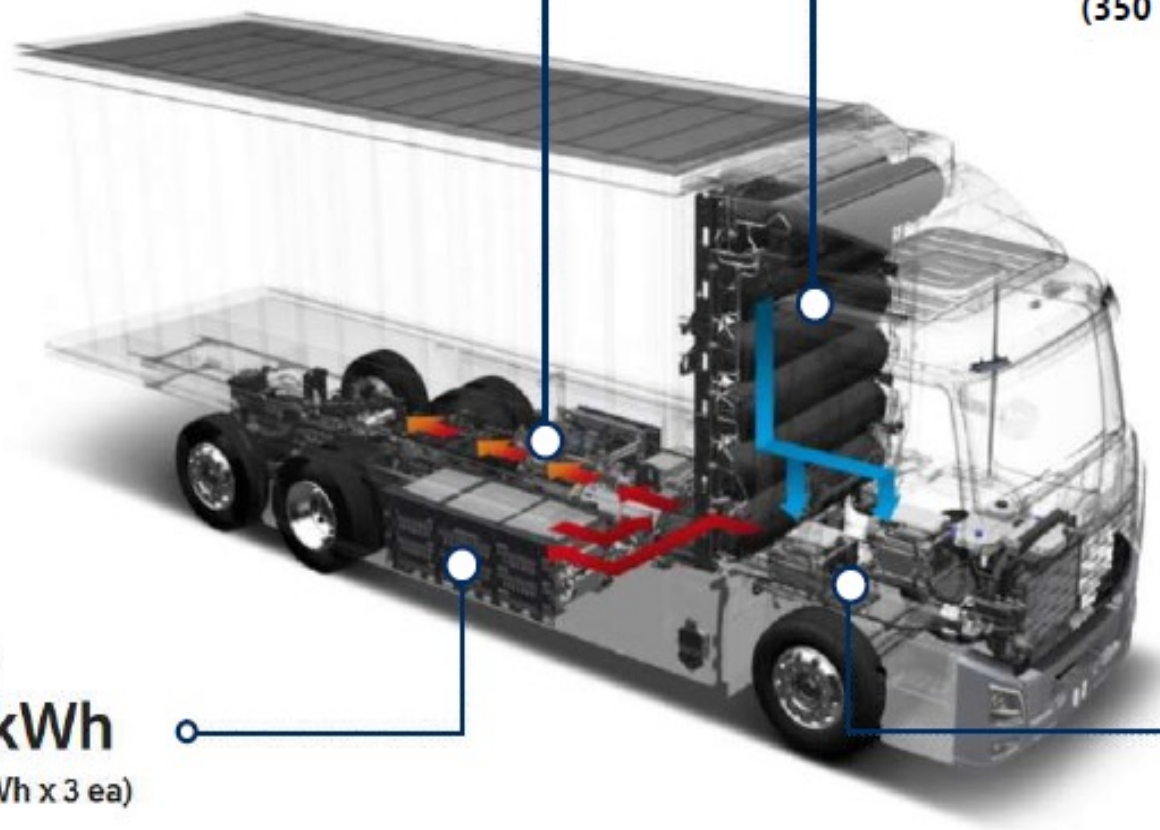
New
Ecosystem

XCIENT
Fuel Cell

New Ecosystem XCIENT Fuel Cell

Motor
350 kW/
2,237 Nm

Hydrogen Tank
31 kg H_2
(350 & 700 bar)



Battery
72 kWh
(24 kWh x 3 ea)

Stack
180 kW
(90 kW x 2 ea)

HYUNDAI

New Ecosystem

Electcity Bus

- Fuel Cell Electric
- Safe and Practical
- Zero Emission & Silent

HYUNDAI

Technology Test Drives

Next Steps


Planning for Infrastructure
Partnerships & Capital City Deployments
The Future is Now

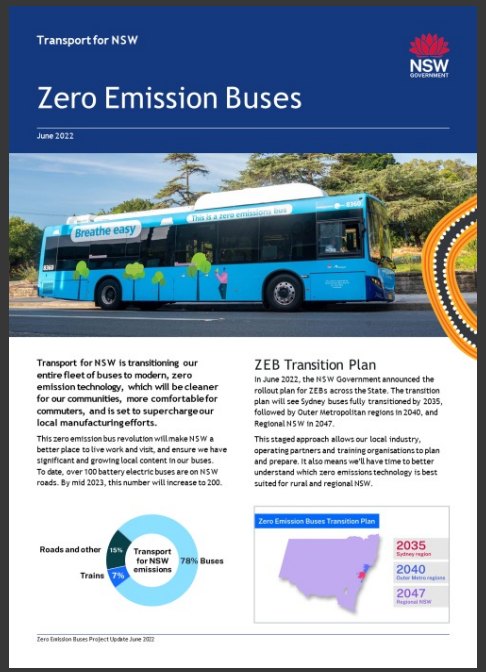
Designing education and training for the future of mobility

- Port Kembla Hydrogen Hub Safety Day

- Christopher Greentree

- February 2023

THE CHALLENGE



1. Size of the fleet

In NSW 8,300 diesel buses, operated by over 500 private contractors across the state.

2. Multiple Manufacturers

Realisation that manufacturers have different standards and procedures.

Employers need to recognise what tasks a worker can / cannot do safely.

3. Identification of differing training requirements for different employees

Technicians / Service people working on bus maintenance – Est. 2,000 pa

Bus drivers and associated staff – Est. 15,000 + 2,000 pa new staff

Infrastructure Installers

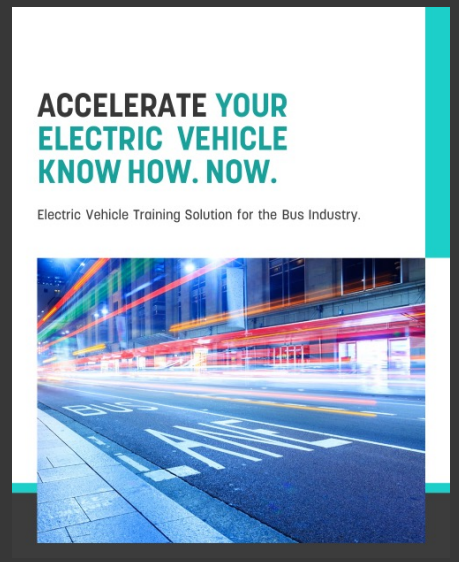
Emergency services and bus company staff

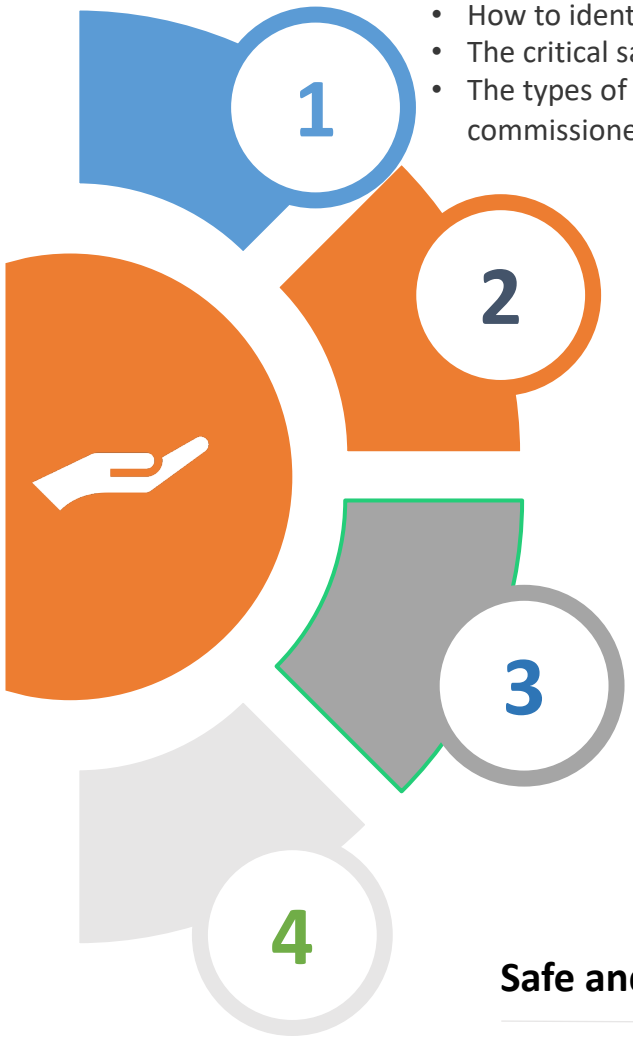
4. TAFE NSW

A training framework leading to skills and knowledge benchmarks

A safer workplace for all employees

THE SOLUTION





Introduction to Electric Vehicles systems and Components

- The key components of an electric vehicle or bus.
- How to identify high voltage systems and components.
- The critical safety features of an electric bus.
- The types of work that can be conducted on an electric bus in a commissioned or decommissioned state.

Connect and disconnect charging systems

- Identify different types of charging devices
- Safely position an electric bus in the location for charging
- Connect an electric charging device to an electric bus
- Safely initiate initial response actions in an emergency whilst a vehicle is charging

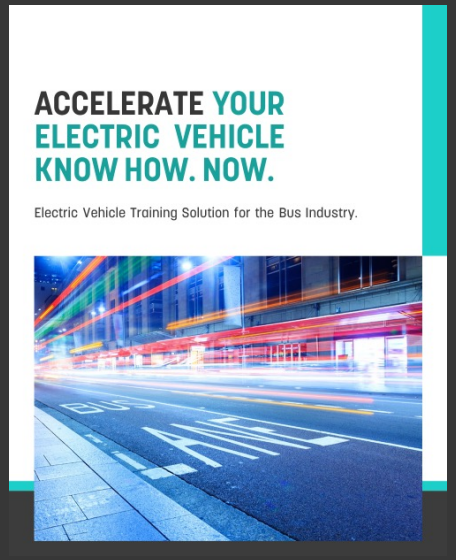
Initial emergency response

- The initial actions a driver should take to make the bus safe
- How to safely evacuate passengers
- How to make sure an electric bus is depowered
- How to conduct vehicle jacking in an emergency situation
- How to prepare for towing and connecting a recovery unit to a disabled bus
- Safety concerns and issues around the salvage and disposal of electric vehicles.

Safe and Efficient Driving

- The key items to check in your daily pre-start inspection
- Essential and targeted driving behaviours for electric buses
- Driving behaviours for energy efficiency

THE SOLUTION



TAFE NSW MICRO SKILLS

- Micro Skills exist to provide up-to-the-minute training solutions that address regulatory changes, rapid advancement in industry technologies and niche skill requirements for individuals and teams.
- Designed in collaboration with manufactures bus operators, regulators and emergency services.

Introduction to Electric Vehicles, Systems and Components

1.5hrs

GET STARTED

Connect and Disconnect Charging Systems

1hr

GET STARTED

Initial Emergency Response

1hr

GET STARTED

Safe and Energy-efficient Driving

1hr

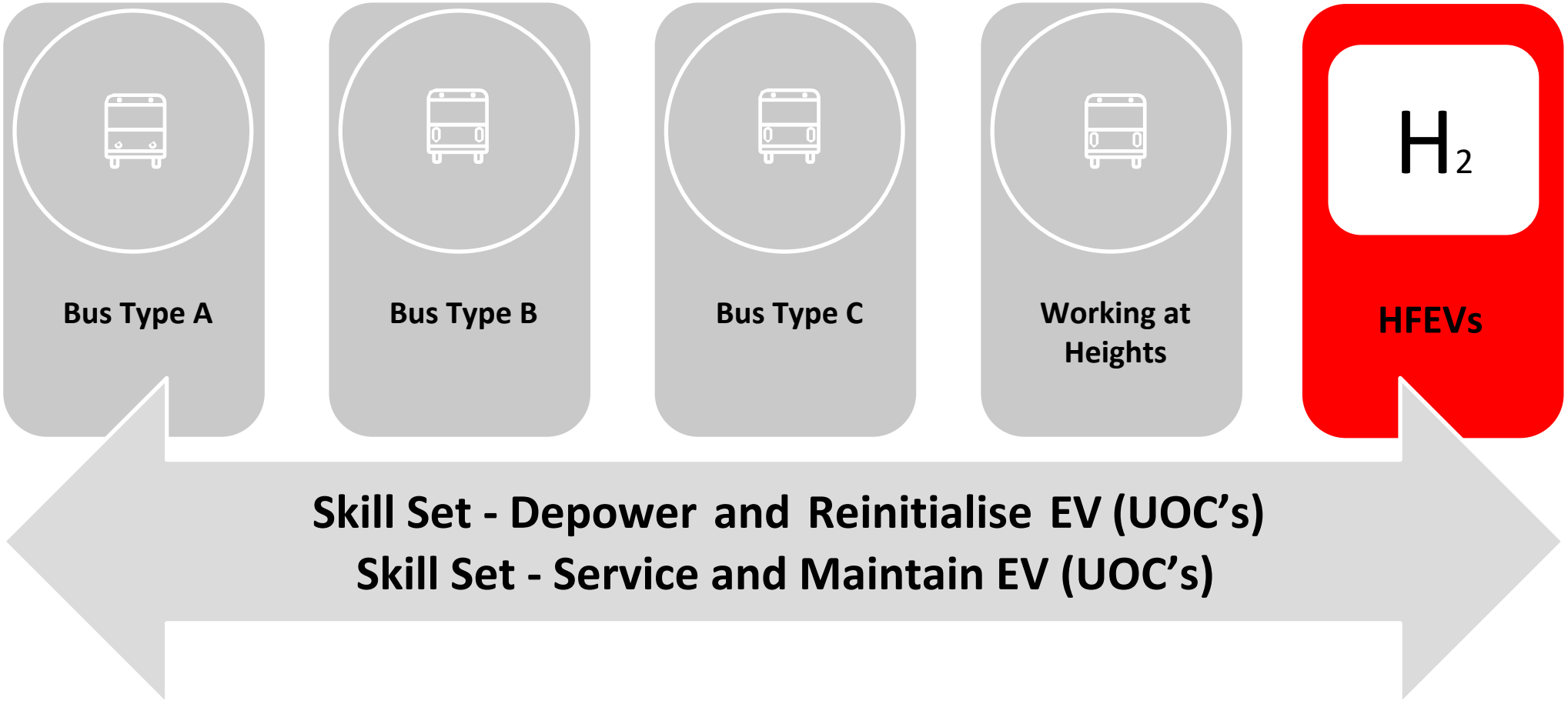
GET STARTED

Training Matrix

Training Matrix											
	Drivers	Supervisors	Yard operators	Wheel Service	Accessory fitters	Salvage	Emergency Responders	General public	Existing Mechanics	Auto electricians	Specialised technicians
Level 1 - Baseline Training Requirements	**Operations**								**Maintenance**		
Introduction to Electric Vehicles, Systems and Components	x	x	x	x	x	x	x	x	x	x	x
Connect and Disconnect Charging Systems	x	x	x	x	x	x	x		x	x	x
Initial Emergency Response and Salvage Operations	x	x	x	x	x	x	x		x	x	x
Safe and Energy Efficient Driving	x	x	x	x	x	x					
Manufacturer & Model familiarisation	x	x	x	x	x	x			x	x	x
Level 2 **General Service and Maintence Operations Units of competancy**									x	x	x

CONTEXTUALISATION MICROSKILLS

SUPPORTING UNITS OF COMPETENCY



Building Microskills

Project Initiation

Project governance, scheduling and planning
Product requirements document

Approval

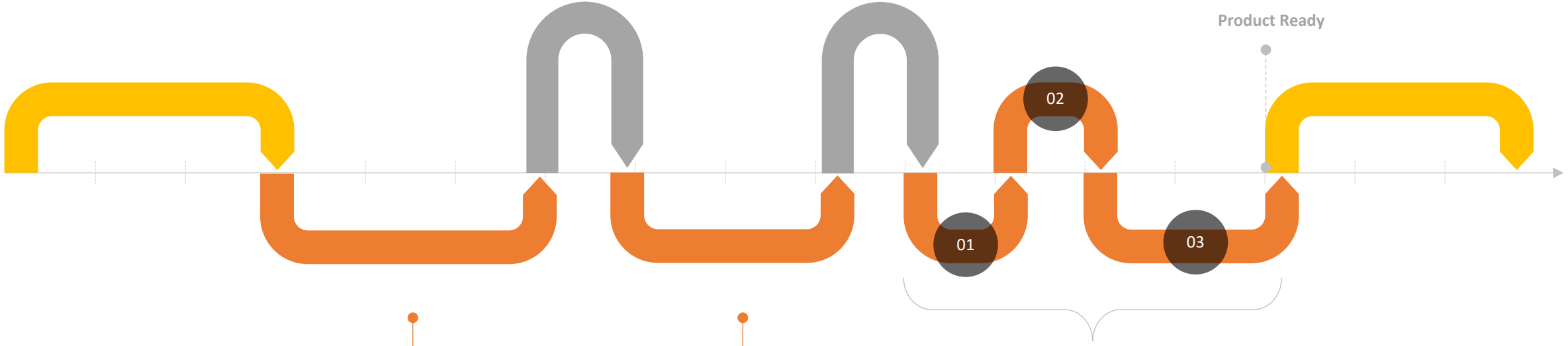
Validation of Product design

QR

Quality Review

Implementation

Product launch & support



Product design

Ideation session, content curation, assessment design, learning design.

Development

Content writing, content authoring, asset development (media/ videos)

Digital build

01 - Platform set-up & configuration
02 - Content integration
03 - Quality Assurance

Release

Product release & delivery

TAFE NSW Microskills

Aboriginal Education (1)

Community Services (2)

Electric Vehicles (7)

Financial Reforms (2)

Hospitality (1)

Real Estate (1)

Accounting and Finance (2)

Cyber Security (9)

Identified Industry Sectors

General

Production	Storage	Transporting Hydrogen	Blending	Transport applications	Export	General	First Responders
Electrolysis	Fuel Cell Applications	Truck operations	Pipeline networks	Fuel Cell Applications	Gas Quality Specifications	Industry Awareness	Fire Rescue NSW
Renewable energy	Fuel Blending Applications	Refuelling decanting	Network Equipment	Fuel Blending Applications		Transferable Skills	AFAC
Gasification	Refuelling	Rail	Components for networks	Refuelling		WHS	Transport for NSW
Steam Methane Reforming	Rail Related		Consumer Piping networks	EV Training			
			Components for end use				

Hydrogen Microskills

Product	Level 1 - Baseline Training Requirements	Drivers	Supervisors	Maintence staff	Yard operators	Wheel Service	Accessory fitters	Salvage	Existing Mechanics	Auto electricians	Specialist Techniciams	Specialised technicians	Emergency Responders	General public
		Industry Baseline Training												
1	Hydrogen energy fundamentals	x	x	x	x	x	x	x	x	x	x	x	x	x
2	Introduction to hydrogen vehicles	x	x	x	x	x	x	x	x	x	x	x	x	x
3	Hydrogen fuel cell technologies	x	x	x	x	x	x	x	x	x	x	x	x	
4	Refueling transport vehicles	x	x	x	x	x	x	x	x	x	x	x	x	
5	Get to know Hydrogen vehicle (Contexulised module)									x	x	x		
	Level 2 - General Service and Maintence Operations Units of competency									x	x	x		

Australian Fire Authorities Council (AFAC)

Reviewing existing international **hydrogen** safety training resources (online and in-person)

Product Breakdown

Delivery Order	Products *(individual modules)*	Content	Estimated Volume of Learning *(hours)*
1	Hydrogen Energy Fundamentals	Module content may include: • What is Hydrogen, its uses, advantages • Overview of the supply chain • Dispelling the myths • Core safety • Jobs of the future – How can you prepare?	2 hr online
2	Introduction to Hydrogen Vehicles	Module content may include: • the key components of a hydrogen vehicle or bus • how to identify high-voltage systems and components • the critical safety features of a hydrogen bus • how to make sure a hydrogen bus is parked in a safe state • the types of work that can be conducted on a hydrogen bus in a commissioned or decommissioned state. • general maintenance of an all-electric / hydrogen fleet.	2 hr online
3	Maintaining a hydrogen vehicle	Module content may include: • Fuel cell systems • Depowering and reinitialising battery vehicles, • maintaining rechargeable energy storage systems, • testing electric motors	2 hr online
4	Refuelling hydrogen transport vehicles	Module content may include: • Refuel and decanter • Safety precautions • Best practice • Emergency response considerations • Standards and how they affect the operator • Future technologies	2 hr online

Microskills in planning (Renewables)

Courses in the pipeline

Add task

Skills build
- Engineering, Procurement, and Construction management for the Renewable Energy Sector

Fundamentals Battery
- Grid scale battery fundamentals

Fundamentals Wind
- Wind turbine fundamentals

Skills build EV
- EV Charging station baseline knowledge

Fundamentals
- Prepare to work in renewable energy sector

Approved for development

Add task

First responders Hydrogen
- Hydrogen - First Responders Mod 1

First responders Hydrogen
- Hydrogen - First Responders Mod 2

Fundamentals Hydrogen
- Hydrogen fundamentals

Project initiation stage

Add task

Hydrogen
- Hydrogen Bus - Foton Module 5

Due

Hydrogen
- Hydrogen Vehicle - Module 1 (Intro)

Due

Hydrogen
- Hydrogen Vehicle - Module 2 (Maintain)

Due

Hydrogen
- Hydrogen Vehicle - Module 3 (Refuel)

Due

Content ideation / creation stage

Add task

Battery First responders EV
- EV First responders - Fire Rescue NSW

1

30/06

Enablers for workforce training programs

Co-operations with NSW Government agencies, industry partners and other TAFEs

- Industry Patterners / Employers
- NSW Department of Education
- Transport for NSW
- Department of Regional NSW
- Fire & Rescue NSW and AFAC
- Industry Associations
- Interstate TAFEs and the Tafe Directors Association
- Our University Partners

New - Jobs and Skills Councils (JSCs), formerly known as Industry Clusters, are being established to provide industry with a stronger, more strategic voice in ensuring Australia's VET sector delivers stronger outcomes for learners and employers.

Industry Engagement

Industry Collaboration Reference Groups (ICRG) have been created to inform TAFE NSW on future industry skills and training priorities, the impact of the training products delivered and the industry skills training requirements.
The ICRGs will provide advice on industry workforce development requirements and training priorities including:

- Advice on existing and planned industry investments and initiatives
- innovative learning and development models
- feedback on training products
- Advice on industry preferences for product quality, design and delivery practices
- Information on industry collaboration opportunities to enhance VET /TAFE NSW perception in the market, influence policy setting and seek funding

Thank you

IndustryInnovationSpecialists@tafensw.edu.au

Questions?