



Victoria's renewable hydrogen potential

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Environment,
Land, Water
and Planning

WHO WE ARE

The Emerging Energy Technologies team leads a work program focused on new and emerging energy projects and on sector development activities.

DELWP Energy Group

The Victorian Government recognises the need for a modern energy system to support our economy and way of life – an energy system that is renewable, sustainable, reliable and affordable. The Energy Group’s primary responsibility is to support current and future energy projects, programs and reforms

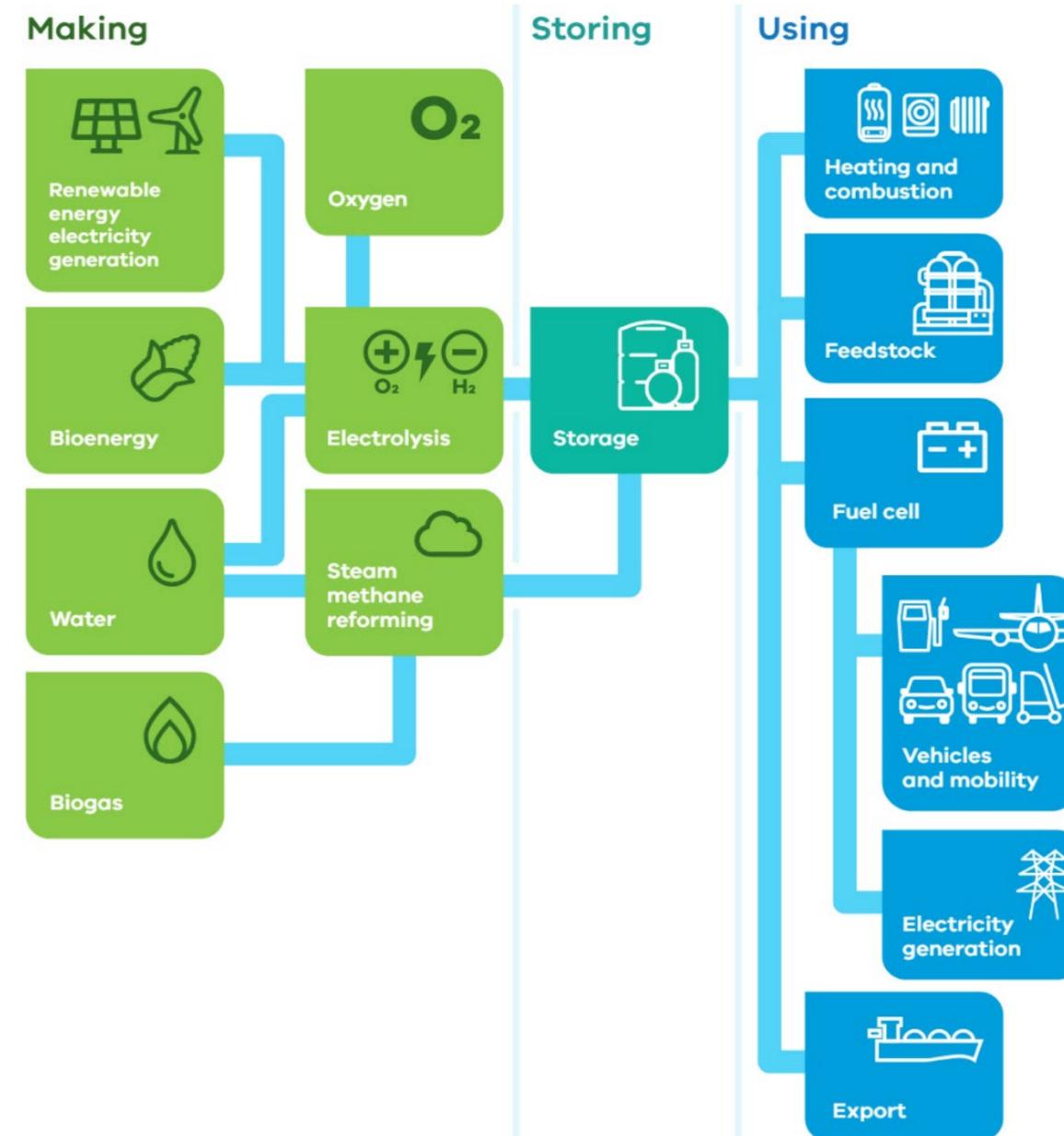


Renewable Hydrogen

The Victorian Government is leading and supporting the development of Victoria’s rapidly emerging renewable hydrogen sector, as part of its work to reach net-zero emissions by 2050.

RENEWABLE HYDROGEN

- Produced from water and electricity
- When generated using entirely renewable sources, there are no carbon emissions.
- Can be combusted, used to make electricity, or as chemical feedstock
- Challenges include cost, transport and infrastructure upgrades required



HOW CAN HYDROGEN BE USED?

Renewable hydrogen:

- Generates no emissions
- Has a higher flame temperature than natural gas
- Can be safely stored and transported
- Is an efficient long distance transport fuel
- Can generate electricity
- Is a key ingredient in producing chemicals like ammonia and methanol

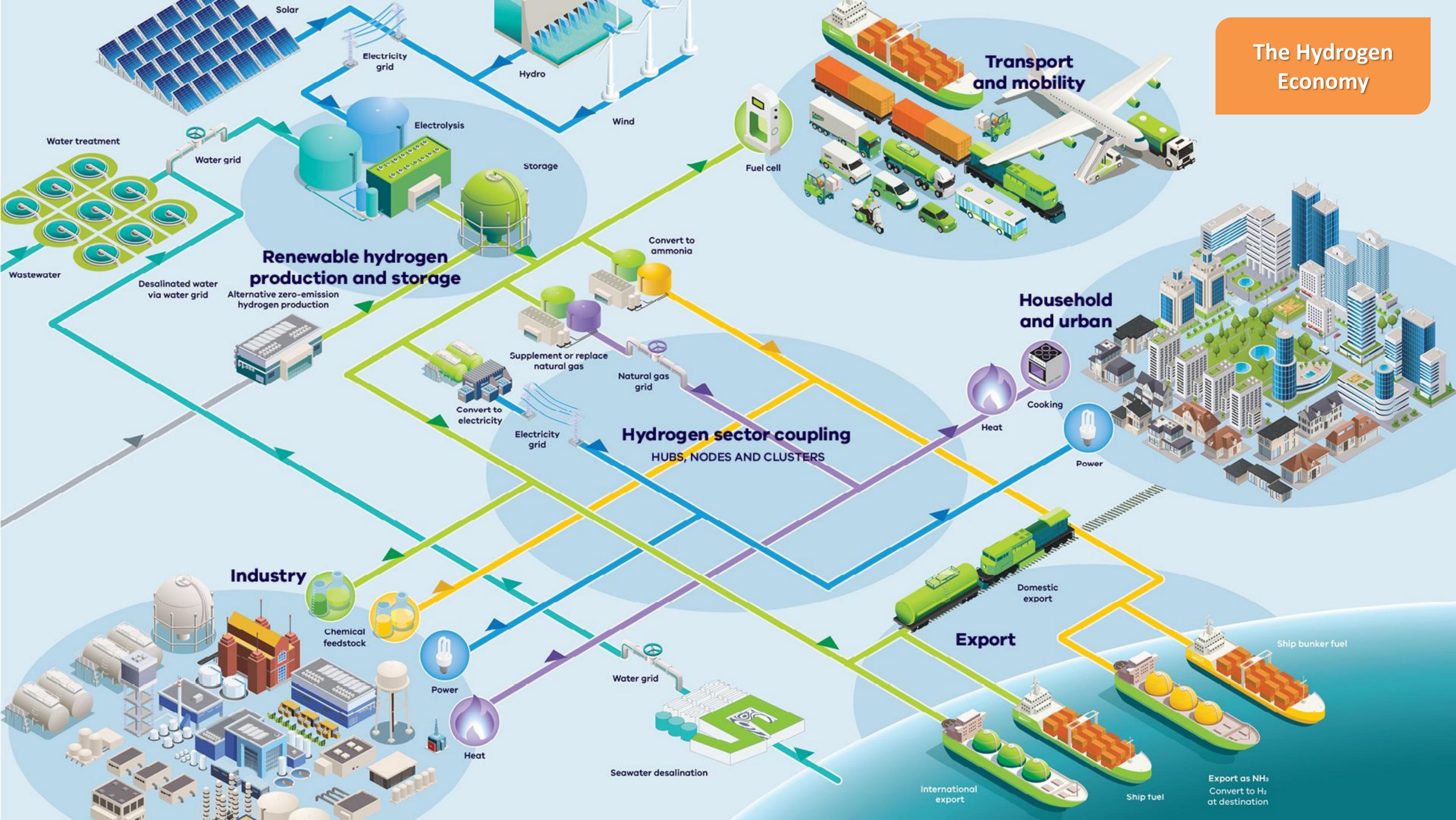


EXAMPLES FROM INDUSTRY

- **Manufacturing** – for high heat processes such as in steel, glass or cement making
- **Agriculture** - as a replacement for diesel for farm machinery and power generation
- **Transport** – for long haul freight or for return to base vehicles like buses and milk tankers
- **Water corporations** – could generate hydrogen using treated water
- **As a substitute for natural gas** for both domestic and commercial purposes



The Hydrogen Economy



VICTORIA'S HYDROGEN EDGE



Our hydrogen edge

Victoria has distinct advantages that could be leveraged to develop a globally competitive advantage in the development and use of renewable hydrogen

MINISTER'S FOREWORD

The Hon. Lily D'Ambrosio MP
 Minister for Energy, Environment and Climate Change
 Minister for Solar Homes



Working together across Victoria, we can accelerate decarbonisation, promote economic recovery and establish a thriving renewable hydrogen industry.

A renewable hydrogen economy can activate options for decarbonising our gas, freight, transport and industrial sectors, supporting more renewable energy in our electricity system, and taking our renewable energy to the rest of the world.

Up to 7,600 jobs are forecast to be generated nationally through emerging hydrogen opportunities, and hydrogen could add around \$11 billion each year to the national economy by 2050.¹ Victoria needs clear policies to ensure we can capitalise on this economic opportunity.

The Victorian Renewable Hydrogen Industry Development Plan sets out a blueprint for how the Victorian Government supports the growth of this emerging high potential sector.

Renewable hydrogen technology could also position Victoria to capitalise on our vast energy resources, provide low cost energy options in the long term and create opportunities for new jobs and economic growth.

Much of this work is already underway. The Renewable Hydrogen Industry Development Plan focuses and aligns current work, while highlighting new areas of opportunity to ensure Victoria can nurture this emerging sector. This plan complements significant investments and the Victorian Government's commitment to the Latrobe Valley Hydrogen Energy Supply Chain (HESC) and CarbonNet projects. However, this Plan is focused on opportunities in renewable hydrogen.

We have a vision for renewable hydrogen to be a part of our economy and the transition to a net zero emission future

The emergence of a renewable hydrogen industry is ideally timed. Renewable hydrogen could play a critical role in reshaping Victoria's economy as it rebuilds following the COVID-19 pandemic.

The Victorian Government is fast-tracking the next generation of renewable energy, with \$108 million to unlock the next wave of cleaner, more reliable power, which could create thousands of jobs. As part of this fund the Victorian Government has committed \$10 million to accelerate Victoria's hydrogen industry. Victoria is also leading significant research through the Australian Hydrogen Centre (AHC); working with National Energy Resources Australia (NERA) to support the development of Regional Hydrogen Technology Clusters and partnering with hydrogen leaders across the sector.

This Plan articulates our understanding of the benefits and opportunities for Victoria and how we can leverage our advantages to activate market opportunities. We have based our approach for establishing a hydrogen economy around clear focus areas coupled with well-designed outcomes that outline our way forward.

This Plan complements the National Hydrogen Strategy while taking into account Victoria's ambitious renewable energy and emissions reductions targets. We are establishing the foundation for growing a renewable hydrogen economy in Victoria, connecting demand with use, and demonstrating leadership through our actions. This is a call to action – we have a vision for renewable hydrogen to be a part of our economy and the transition to a net zero emission future.

THE VICTORIAN RENEWABLE HYDROGEN INDUSTRY DEVELOPMENT PLAN

Creating new jobs and industries

Building Victoria's skills and capabilities

Driving innovation

Reducing emissions



THE RENEWABLE HYDROGEN VISION

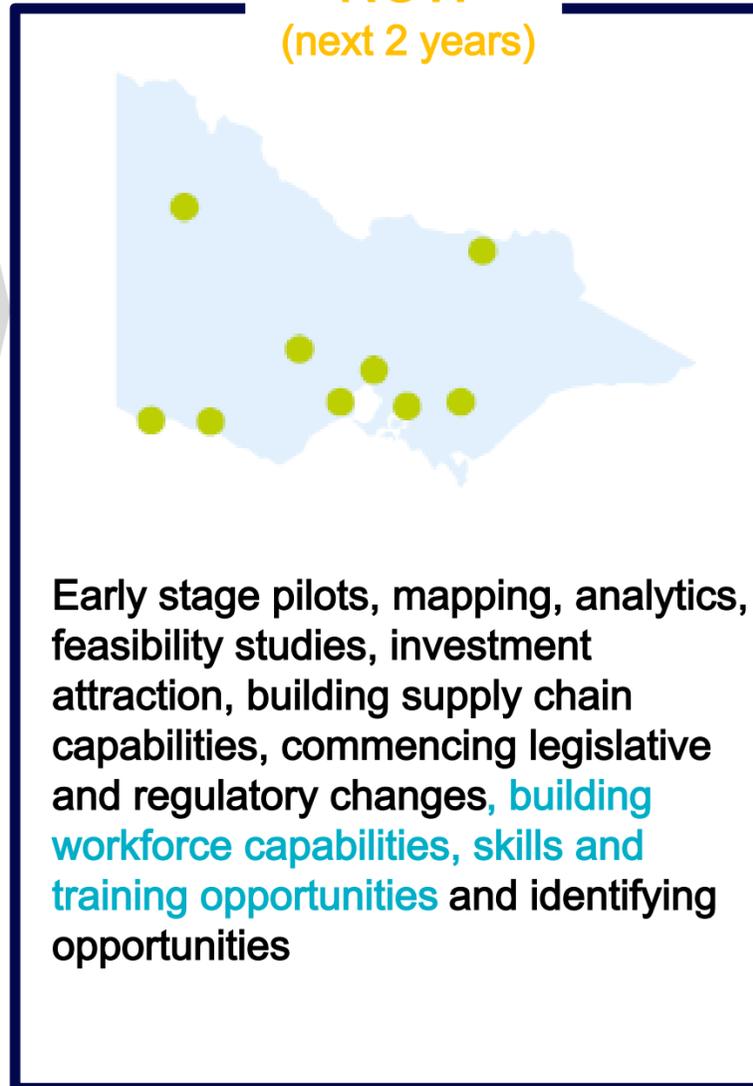
Foundation



- Develop a plan to fast track renewable hydrogen development, deployment and market activation – what’s needed.
- Identify rapidly emerging global market opportunities and Victoria’s approach
- Establish Victoria as a leading jurisdiction

“The first steps”

NOW
(next 2 years)



Early stage pilots, mapping, analytics, feasibility studies, investment attraction, building supply chain capabilities, commencing legislative and regulatory changes, **building workforce capabilities, skills and training opportunities** and identifying opportunities

Scalability and sector coupling



- Large scale pilots and demonstrations for freight and hydrogen gas blending
- Encourage sector coupling and interconnection of regions
- Attract significant investment

Hydrogen economy



Renewable hydrogen is commercially ready and supports decarbonisation of multiple sectors and state-wide economic activity, including an active export market

HEADLINE INITIATIVES

An unprecedented \$1.6 billion Victorian Government energy budget package to power Victoria's economic recovery and the state's progress towards a clean energy future, including substantial investment in renewable hydrogen.

\$6.2m Renewable Hydrogen Commercialisation Pathway Fund

Establish new industry partnerships and memberships

Support universities to grow H₂ capabilities

\$1.0m Renewable Hydrogen Business Ready Fund

Support for four Victorian Hydrogen Technology Clusters

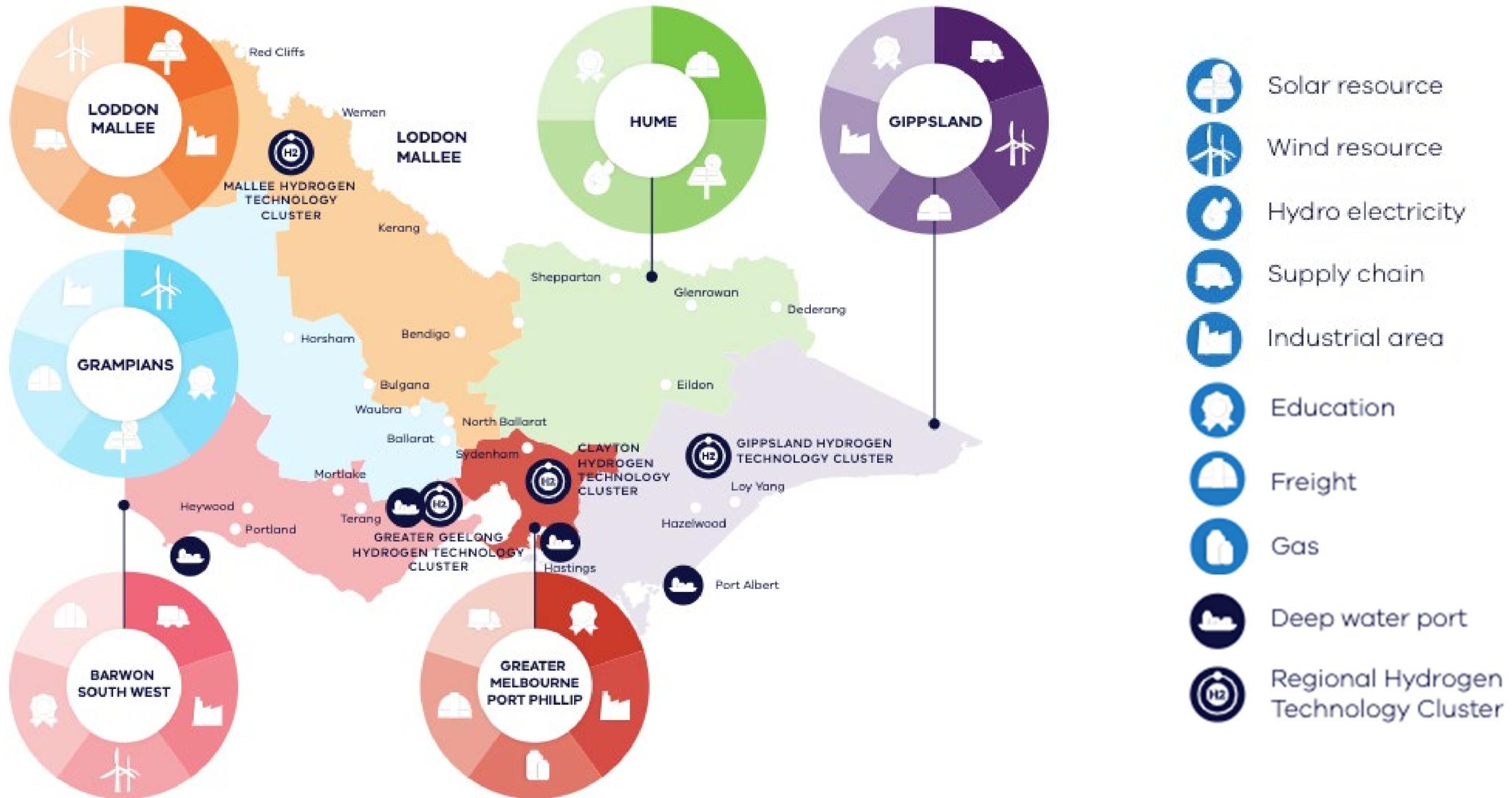
\$108m Energy Innovation Initiative

Establish Victorian Hydrogen Cluster Network

Full details in the Plan



OUR REGIONS ARE CENTRAL TO GROWTH



HYDROGEN AND THE MALLEE



- Established, large scale solar photovoltaic projects located near Mildura, Swan Hill and Kerang
- Connections to major state and interstate freight corridors
- A high concentration of heavy vehicles and transport companies
- Emissions intensive industries such as agriculture and manufacturing

Contact us

emerging.energy@delwp.vic.gov.au

For information on

- The Renewable Hydrogen Industry Development Plan and
- Renewable Hydrogen grants



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www.energy.vic.gov.au/renewable-hydrogen

