CCUS Hubs Study

Key findings from the WA CCUS Hubs study undertaken by CSIRO and GCCSI for the Western Australian LNG Jobs Taskforce

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CSIRO

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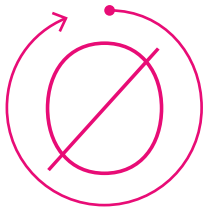
The Western Australian (WA) LNG Jobs Taskforce commissioned CSIRO and GCCSI to undertake a study into the potential for developing Carbon Capture Utilisation and Storage (CCUS) hubs in Western Australia. This is a summary of key findings. Further information about the study partners and a glossary is included on page 16.

The opportunity for CCUS hubs in Western Australia



CCUS is critical to achieving **net zero**

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CCUS is currently the only **technologically viable** option to decarbonise a number of existing emissions-intensive industries including gas processing, aluminium refining, cement and fertiliser production

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CCUS is a **globally tested, safe and established** method for decarbonisation and is already being established globally through government and industry partnerships

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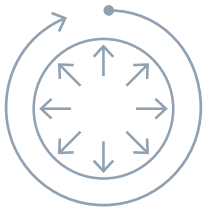

WA has the **capacity** to store not only its own carbon, but that of other carbon emitters—including overseas carbon emitters who are already seeking carbon storage options

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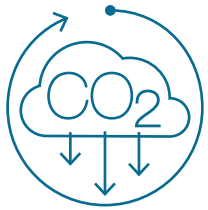

WA has large-scale emissions-intensive industries that are clustered in areas where CCUS hubs can play an important part of the **emissions reduction portfolio**

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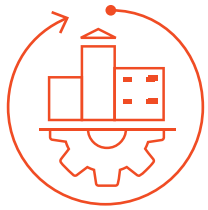

WA has industries that contribute to emissions but also has **infrastructure** with the potential to be leveraged or repurposed for CCUS hubs

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WA has an existing workforce with the **skills and experience** to develop CCUS hubs—which will secure jobs for the existing workforce and develop a skilled workforce for WA

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WA CCUS hubs would support cross-sector collaboration towards decarbonisation including the **co-location of hydrogen and ammonia** industries

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WA CCUS hubs have the potential to attract significant overseas investment to the WA **economy** and enhance economic relationships with regional partners

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ENABLED BY: **RECOGNITION OF CCUS** IN WA'S EMISSIONS REDUCTION MEASURES, **APPROPRIATE POLICY AND REGULATORY FRAMEWORKS** AND **ACTION NOW** TO ALLOW FOR THE LEAD TIMES OF 7–10 YEARS.

Achieving net zero: The challenge

Australia's commitment to net zero

Australia, along with a growing coalition of nations, has signed up to achieving net zero emissions by 2050 in order to limit global warming. Western Australia has set targets consistent with this goal.

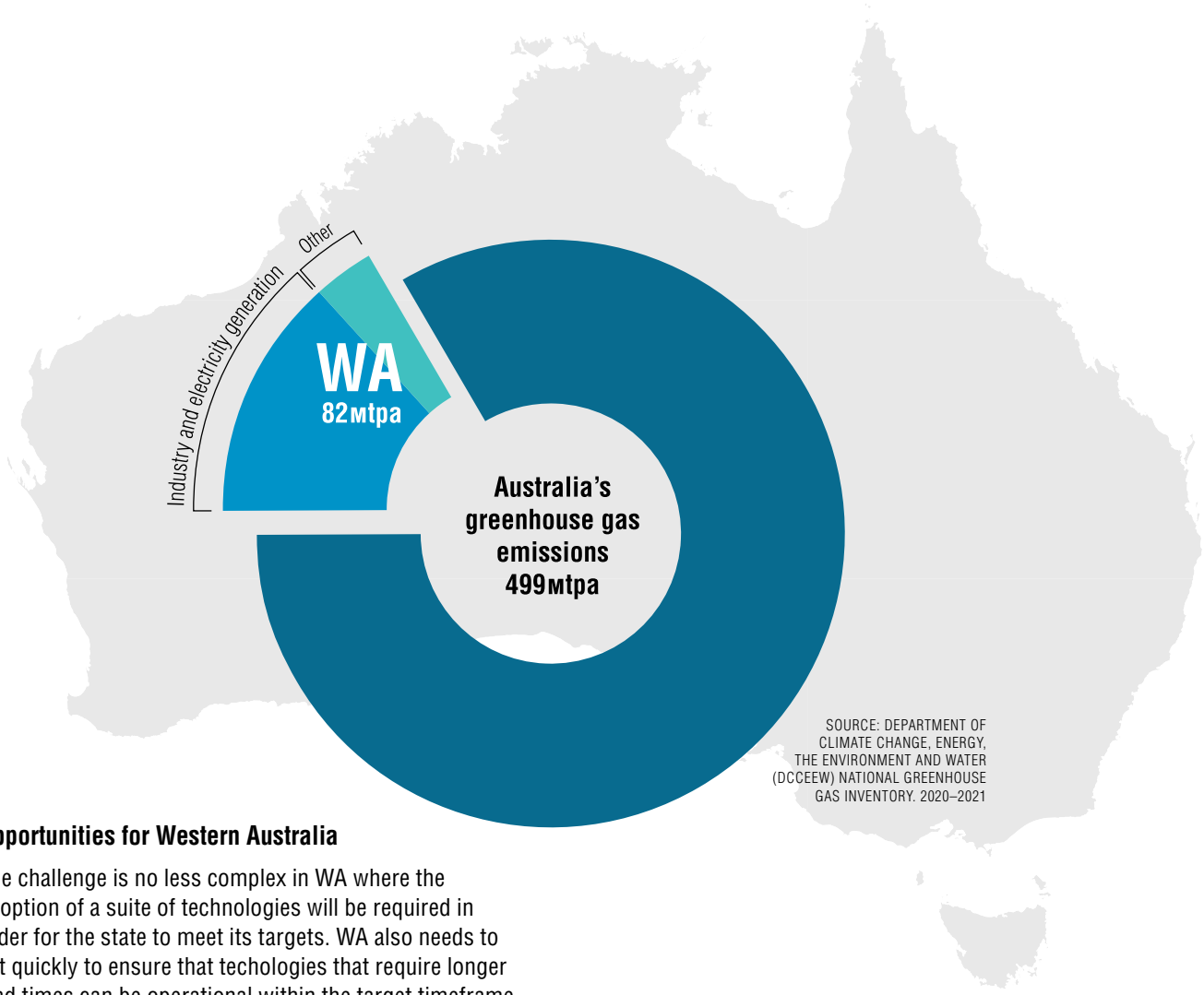
Western Australia contributes 82 million tonnes per annum (Mtpa) CO_2 equivalent (CO_2e), or 17%, to Australia's total greenhouse gas emissions. Of that, 66Mtpa is from emissions-intensive industries such as oil and gas, mining and power generation.

Supporting the transition to a carbon neutral future

Reducing emissions whilst supporting an economically viable transition to a carbon neutral future is a challenge that all nations are facing, and nowhere more so than in Western Australia where emissions-intensive industries contribute $170 billion (47%) to the WA state GDP and directly provide around 120,000 jobs.

Navigating the challenge

Part of the emissions reduction challenge is that whilst emissions are counted in homogenous units (CO_2e), their source, concentration, and the point at which they are generated are not. And whilst several reduction, mitigation and abatement options exist, all options are finite, eventually encountering physical limitations that make them either not feasible (e.g. all energy improvements have been implemented) or increasingly (and prohibitively) expensive (e.g. increasingly higher prices for land to carry out land-based projects such as forestation). This means that to achieve net zero by 2050 in the most cost-effective manner, a portfolio of abatement strategies and technologies is required.



SOURCE: DEPARTMENT OF CLIMATE CHANGE, ENERGY, THE ENVIRONMENT AND WATER (DCCEEW) NATIONAL GREENHOUSE GAS INVENTORY. 2020–2021

Opportunities for Western Australia

The challenge is no less complex in WA where the adoption of a suite of technologies will be required in order for the state to meet its targets. WA also needs to act quickly to ensure that techologies that require longer lead times can be operational within the target timeframe, and benefit from the economic uplift and sovereignty.

To achieve net zero by 2050 in a cost-effective manner, we need a portfolio of abatement strategies and technologies including CCUS.

Achieving net zero: The role of CCUS

The International Energy Agency (IEA) identifies four emissions reductions technologies that are essential for achieving net zero by 2050. One of these is carbon capture, utilisation and storage (CCUS).

How does it work?

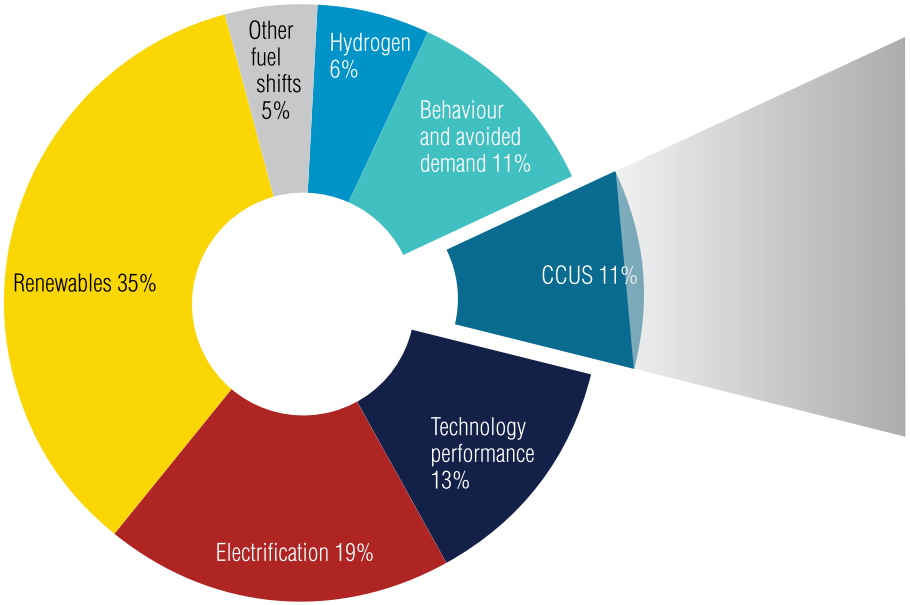
Carbon capture and storage involves the capture of CO_2, generally from large point sources like power generation or industrial facilities that use either fossil fuels or biomass as fuel. This CO_2 is compressed and transported by pipeline, ship, rail or truck then injected into deep geological formations such as depleted oil and gas reservoirs or saline aquifers. CCUS refers to the same capture process with the resultant CO_2 used in other industries such as in the production of fertiliser, synthetic fuels, chemicals and building aggregates. CCUS hubs assure the CO_2 streams these industries need.

Proven, safe and ready

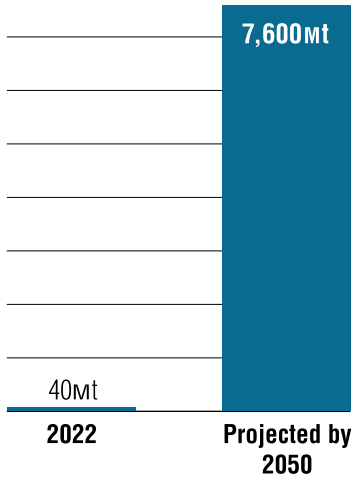
CCUS is the only technology available for immediate implementation that has the potential to work across a number of emissions-intensive industries such as gas processing, aluminium smelting and power generation These industries include all of the WA facilities registered under the Safeguard Mechanism—net zero by 2050 to meet the state emissions reduction target. In the IEA's Global 2021 Net Zero Scenario, CCUS is predicted to capture 7,600Mtpa by 2050. In WA CCUS has the potential to achieve up to one third of the state's total emissions reduction target.

CCUS—whilst often viewed as a new technology—was first proposed in 1938 and the first large-scale project to inject CO_2 into the ground launched in Texas in 1972. A quarter of a century later, Norway launched the world's first integrated carbon capture and storage project, known as Sleipner, in the North Sea. Through these and other projects, CO_2 has been captured and stored safely and securely for decades and more recently in WA's Gorgon project where 8Mt CO_2 has already been successfully captured and stored.

Cumulative emissions reduction by mitigation method in the IEA's 2021 Global Net Zero Scenario 2021–2050



Current and required annual capture of CO_2 through CCUS



Benefits of scaling up

Whilst CCUS has played a relatively small role in emissions reduction to date, the rapid scaling up of CCUS that is essential to meeting our emissions reductions targets, will drive down prices through economies of scale and technological improvements as well as make it available to a wider range of industries. Further, the planned, systematised investment in CCUS hubs will support the production of hydrogen, ammonia and other building blocks of a future low-carbon economy.

CCUS has the potential to reduce WA emissions by up to one third.

Achieving net zero: The opportunity

A vital and growing global industry

CCUS is a growing industry. The IEA estimates that in the US alone, investment in CCUS is estimated to be in the region of US$27 billion per year.

WA's geology, technological expertise, existing infrastructure and geopolitical landscape make it well positioned to become a global player in CCUS through the establishment of CCUS hubs.

Modelled examples demonstrate what is possible

The study undertaken by CSIRO and GCCSI includes modelling of example sites. The example Pilbara CCUS Hub with additional CO_2 shipped from Kwinana emitters could:

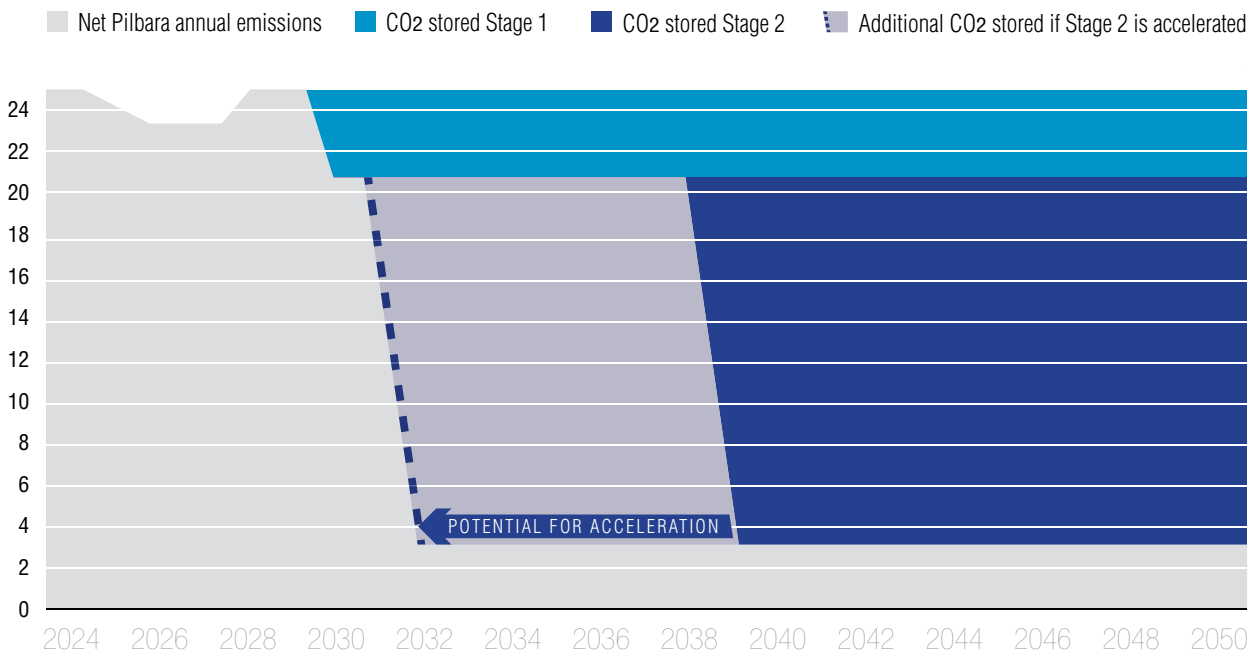
- meet 33% of WA's emissions reduction target and up to 90% of emissions in the Pilbara region adjacent to the hub
- generate 37,000 jobs during construction, a further 500 permanent jobs and provide security for existing emissions-intensive jobs
- boost WA state GDP by $55 billion between 2030 and 2050.

Key enablers will be required to make this happen

The study recommends that to realise this opportunity, the following is essential:

- **Recognition of CCUS** as a part of WA's portfolio of measures to achieve its emissions reduction target.
- **Appropriate policy and regulatory frameworks** to support CCUS into the future.
- **Action now**—to allow for the lead times of 7–10 years. If WA waits until CCUS projects are economic for developers and customers, there likely won't be enough time to get the projects operational before 2050.

Pilbara industrial source annual emissions to 2050 (Mtpa)

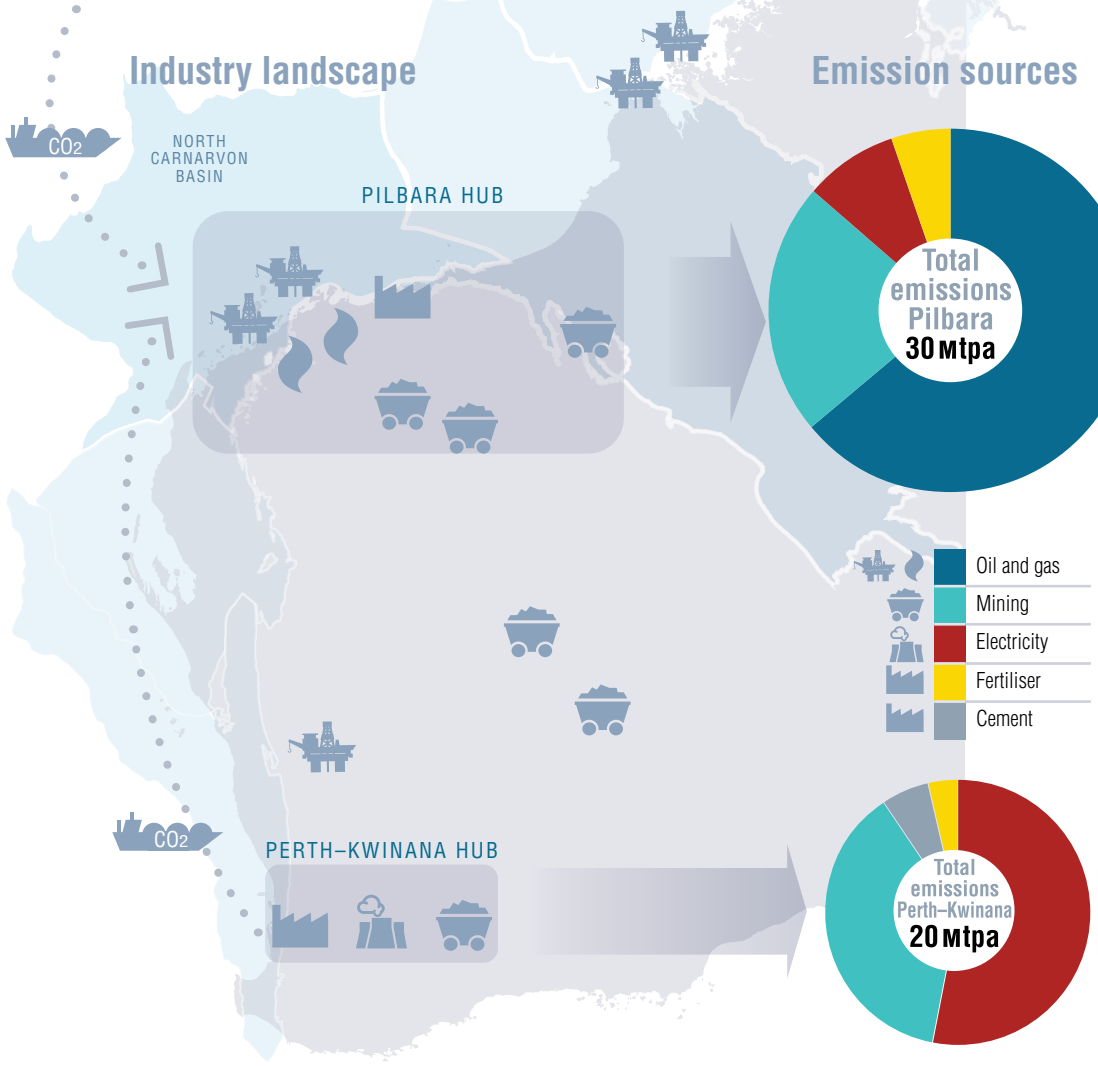


The study models two example CCUS hubs aligning with the two major emissions clusters—the Pilbara and Perth–Kwinana areas. The above chart shows a modelled reduction of 90% of industrial source emissions in the Pilbara.

WA has the capacity, technology and geopolitical landscape to be a global CCUS player if it acts now.

Hubs example: Pilbara and Perth–Kwinana

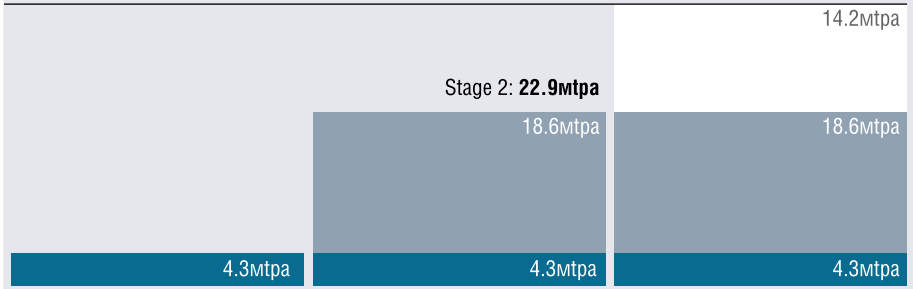
Industry landscape



Emission sources

Carbon capture potential

Pilbara Hub



Pilbara Stage 1
4.3 Mtpa CO_2 from higher CO_2 concentration emissions sources including reservoir CO_2 separated from natural gas processing and high-CO_2 streams from ammonia/fertiliser production.

Pilbara Stage 2
An additional 18.6 Mtpa CO_2 from lower CO_2 concentration emissions that require post combustion CO_2 capture and new industries including blue H_2 and ammonia.

Pilbara Stage 3
An additional 4.2 Mtpa from Perth–Kwinana and 10 Mtpa from international emissions imported by ship supporting decarbonisation of the Asia–Pacific.

Perth–Kwinana Hub

Perth–Kwinana Stage 1
2.0 Mtpa CO_2 from higher CO_2 concentration emissions sources including ammonia processing and cement.

Perth–Kwinana Stage 2
An additional 2.2 Mtpa CO_2 from lower CO_2 concentration emissions including post-combustion gas turbines.

North Carnarvon: Prospective storage resources

SOURCE: CARBON STORAGE TASKFORCE 2009. NATIONAL CARBON MAPPING AND INFRASTRUCTURE PLAN

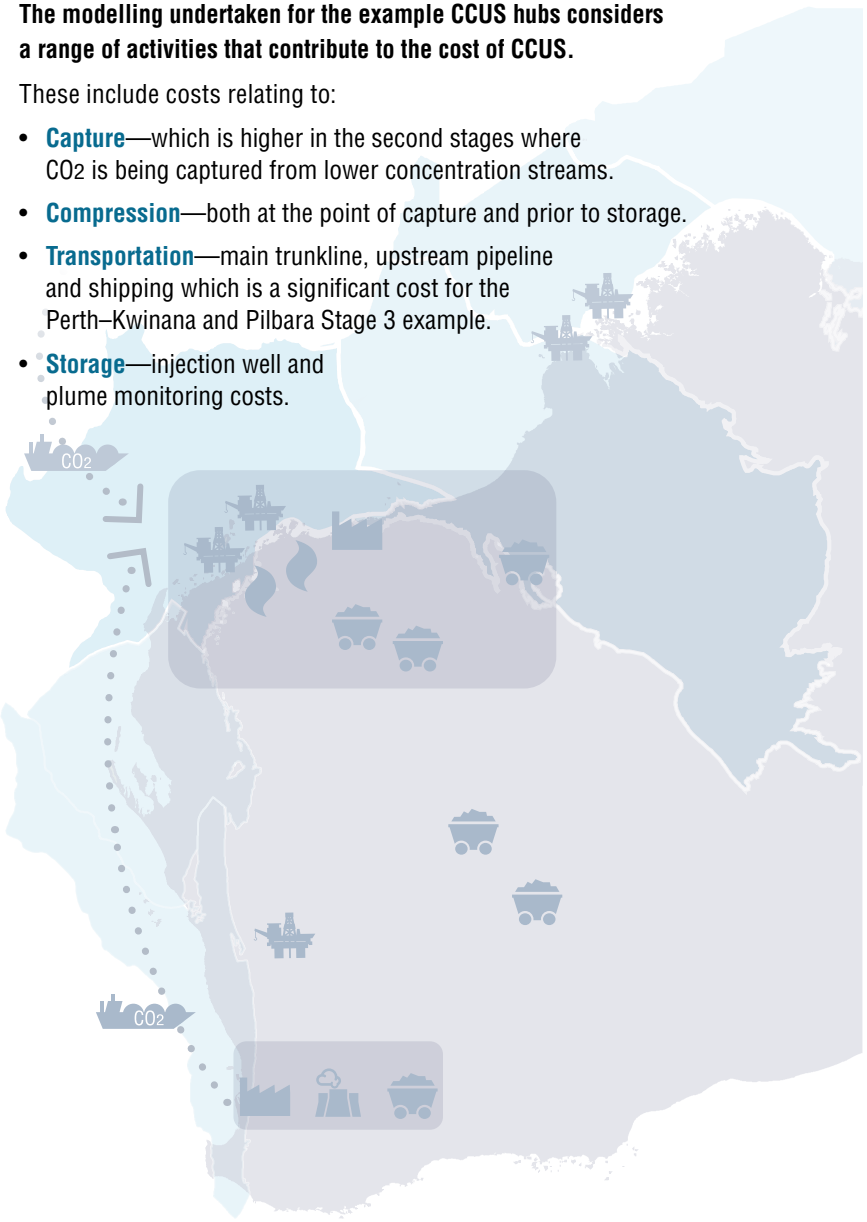
- **27Mtpa (33%) reduction in WA emissions**
- **37,000 jobs in construction + 500 permanent ongoing**
- **$55 billion boost to state GDP**
- **Existing infrastructure repurposed**
- **Up to 195,000Mt prospective storage resources**
- **Seed for low carbon hydrogen**

Hubs example: contributing costs

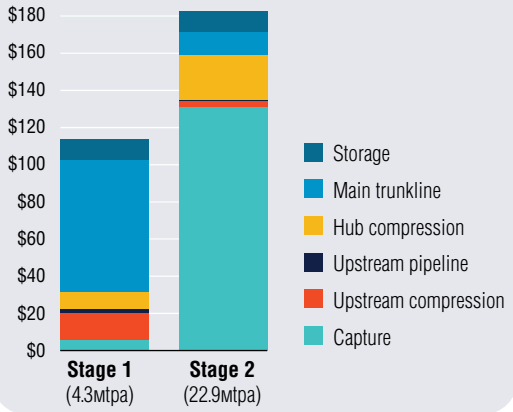
The modelling undertaken for the example CCUS hubs considers a range of activities that contribute to the cost of CCUS.

These include costs relating to:

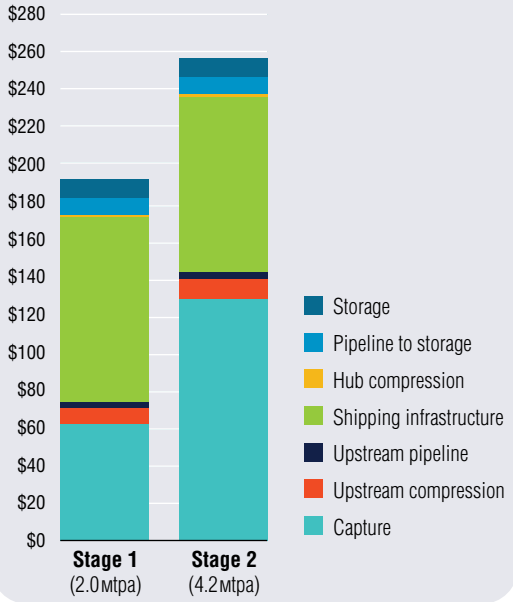
- **Capture**—which is higher in the second stages where CO_2 is being captured from lower concentration streams.
- **Compression**—both at the point of capture and prior to storage.
- **Transportation**—main trunkline, upstream pipeline and shipping which is a significant cost for the Perth–Kwinana and Pilbara Stage 3 example.
- **Storage**—injection well and plume monitoring costs.



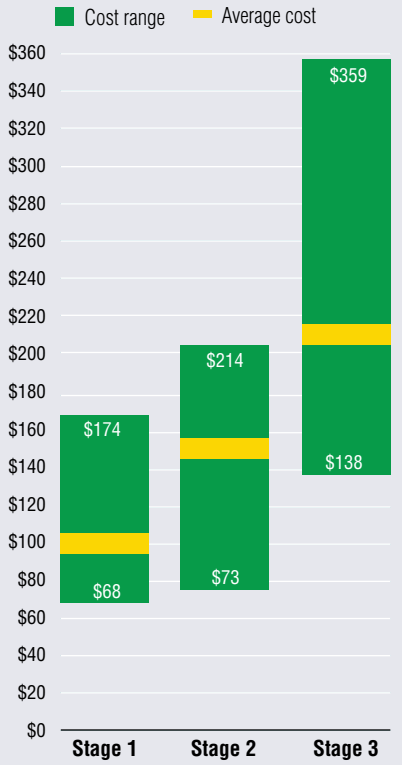
Pilbara Hub: cost breakdown per tonne CO_2



Perth–Kwinana Hub: costs per tonne CO_2



Pilbara Hub: range and average cost per tonne CO_2



The modelling show CCUS costs from $70 per tonne. This is high compared to current alternative abatement options, but competitive by the time a CCUS hub might come online.

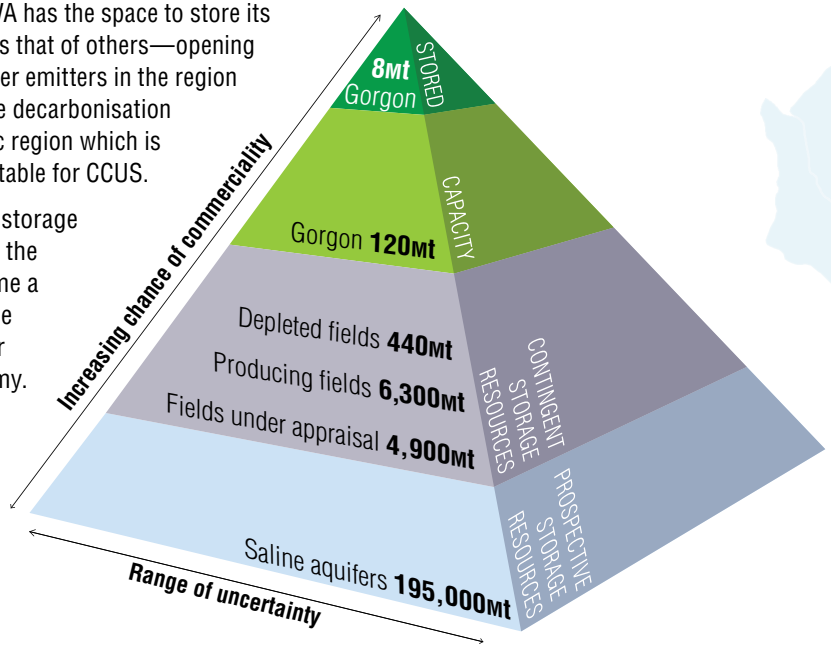
Carbon storage capacity

The modelled Pilbara example would have a capacity to sequester 40Mtpa—a similar amount to that currently being stored annually across the globe.

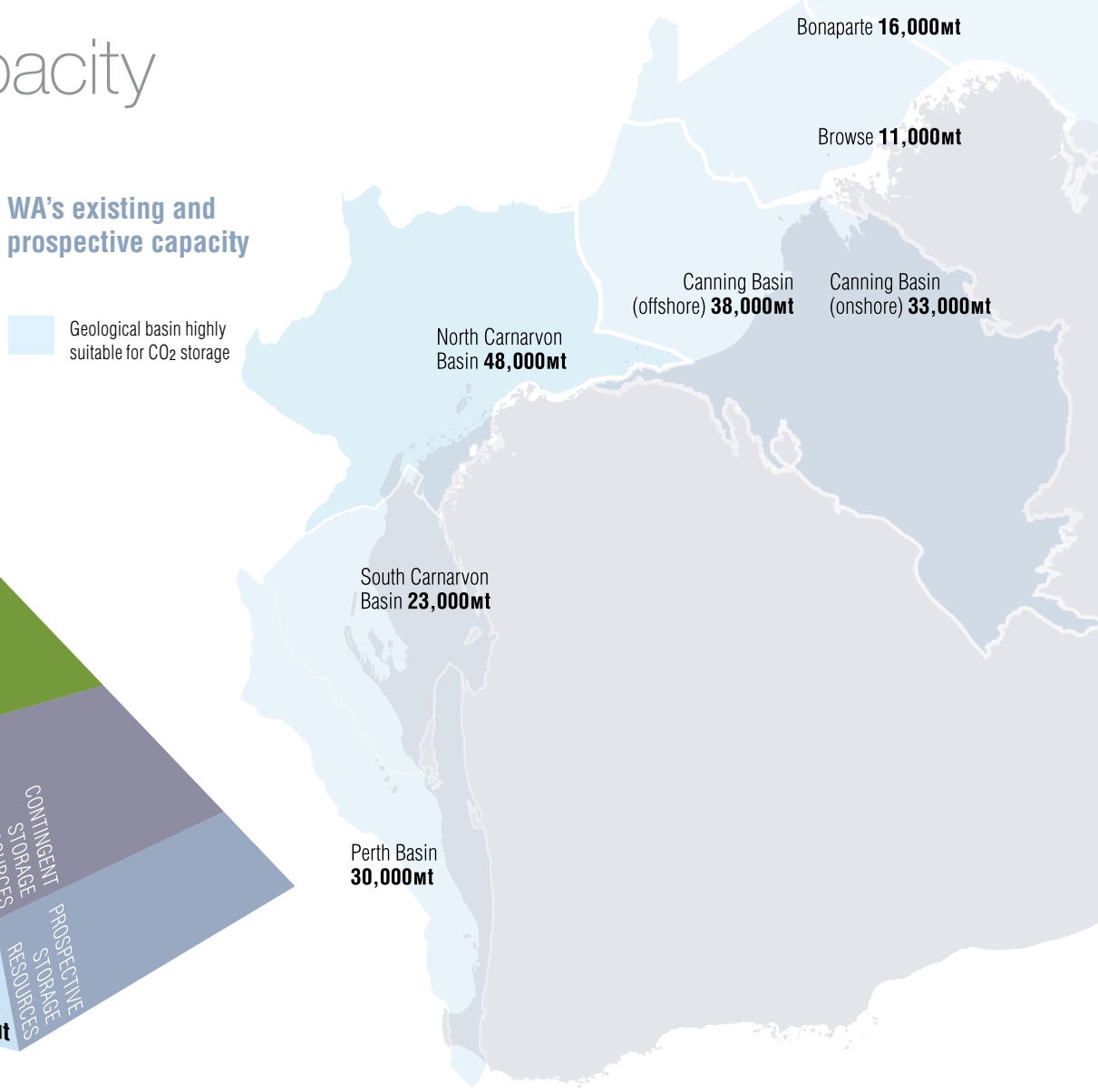
Overall WA has abundant potential capacity to store CO_2. The study shows a total prospective storage resources of 195,000Mt CO_2. North Canarvon Basin alone with prospective storage resources of 48,000Mt is sufficient to store all WA's current annual emissions for 700 years.

This means that WA has the space to store its own CO_2 as well as that of others—opening up a market to other emitters in the region and supporting the decarbonisation of the Asia–Pacific region which is geologically unsuitable for CCUS.

WA's prospective storage resources gives it the potential to become a global powerhouse in the future lower emissions economy.



WA's existing and prospective capacity



Enablers/accelerators

1. A regulatory regime to establish rights-of-way to CCUS hubs
2. Support the exploration and appraisal of prospective storage resources

Enough capacity to store 700 years of WA emissions and that of our regional partners.

Reducing emissions

Emissions in Western Australia

WA is home to 69 of the 215 Australian facilities registered under the safeguard mechanism—meaning that those facilities must manage any emissions above their baseline.

The study modelled two example hubs located around major emissions source clusters in WA: the Pilbara and Perth–Kwinana.

Types of emissions streams

Emissions are classified as being from either low or high concentration streams.

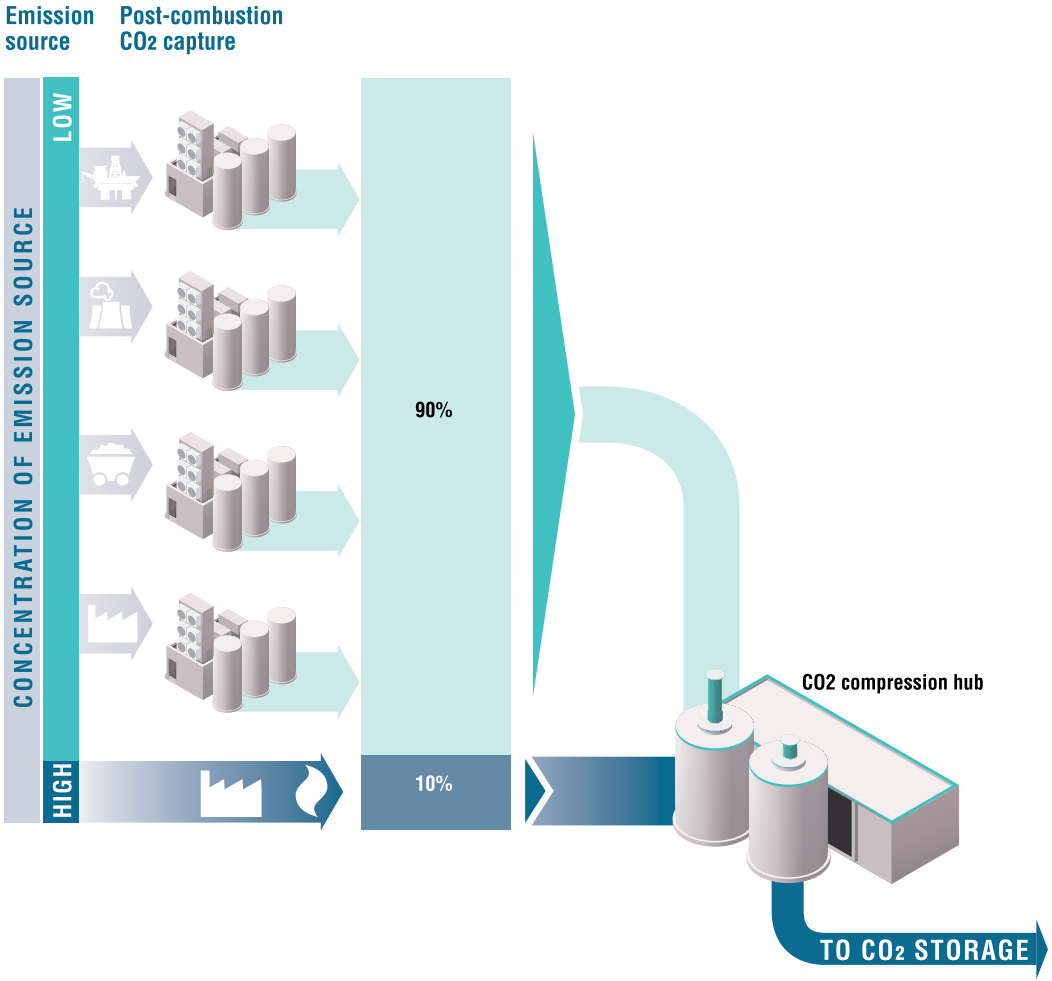
High concentration: Approximately 10% of CO_2 emissions are from high concentration streams such as reservoir CO_2 vents from gas facilities. High concentration streams require minimal processing before storage and would provide a cornerstone for stage 1 of a hub.

Low concentration: Approximately 90% of emissions are from low concentration streams. These are harder to capture and require expensive additional processing to capture and concentrate to more than 95% purity so they can be injected into underground storage. The capture of CO_2 from large volume post-combustion sources would be part of stage 2 of a hub.

Potential for direct and indirect emissions reductions

The study finds a CCUS hub has the potential to provide the stable sink for the CO_2 that is generated from blue hydrogen production. The high concentration CO_2 emitted during the initial phase can be immediately stored—potentially making the process carbon-neutral. The hydrogen generated is then available to displace other fuels and decarbonise harder to abate industries such as cement and steel manufacture.

Breakdown of source emissions for CCUS in WA and required processing



Enablers/accelerators

1. Support research and development of capture technologies to drive down prices
2. Fiscal incentives to kick-start CCUS development as is happening elsewhere in the world

Investment in CCUS technology now will provide both direct and indirect emissions abatement.

Infrastructure

Current infrastructure

WA already has significant infrastructure supporting high emitting industries that could be repurposed for CCUS. In addition this infrastructure is geographically located adjacent to WA's significant storage capacity.

Repurposing infrastructure offers substantial cost savings for competitive CO_2 abatement. The study does not specifically explore costs associated with repurposing infrastructure, however the IEA estimates that repurposing pipelines could be as low as 1–10% of the cost of creating new. There are further benefits to the environment from extending the utility shelf life, with deferred or reduced decomissioning.

Economies of scale and wider emissions reduction

The hubs model not only provides the economies of scale in development but also makes the CCUS process viable for smaller operations and facilities for whom the technology would otherwise be out of reach.

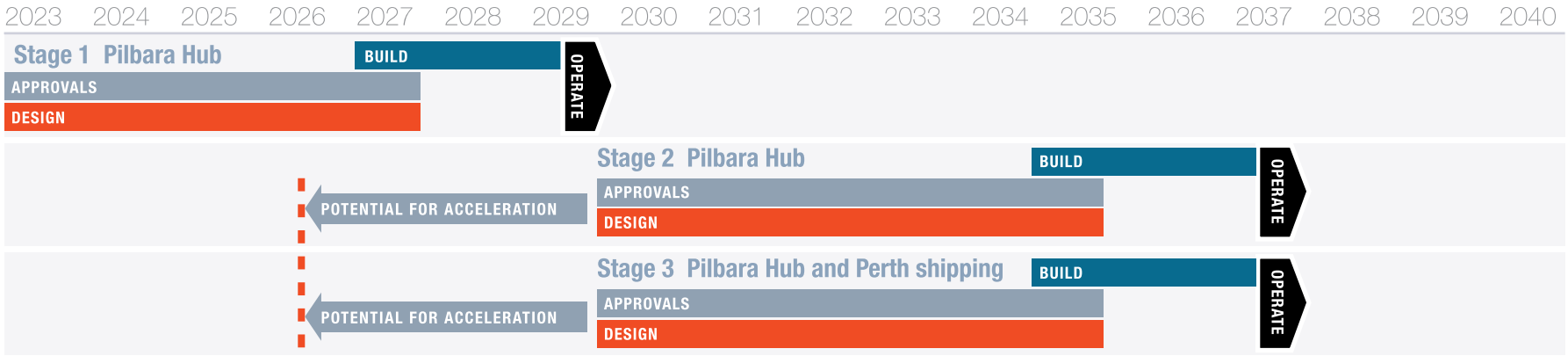
The concentration of this infrastructure within CCUS hubs would attract industries for whom CCUS provides options for decarbonising, and for future ventures and technologies that require concentrated CO_2. These include industries such as fertiliser manufacture, carbon black and mineral carbonation.

Infrastructure investment required

Notwithstanding the existing infrastructure, there is still a considerable amount of investment needed to realise CCUS at a competitive price and in particular in the capture of CO_2 from low concentration streams.

Attracting investment is more difficult in the absence of any clear price signals. Furthermore the 7–10 year lead time required to set up CCUS means that waiting for a clear price signal would mean that the operation would not achieve its potential within the target timeframe.

Infrastructure development lead times



Enablers/accelerators

1. Business model and governance framework for shared infrastructure
2. Appropriate fiscal incentive model to encourage immediate investment
3. Align and streamline federal and state approvals processes for developments
4. London Protocol adoption and framing of WA's opportunity in CO_2 shipping

Investment in CCUS technology now will provide both direct and indirect emissions abatement.

Skilled and experienced workforce

Powering WA employment

There are 120,000 people directly employed in WA's resource sector.

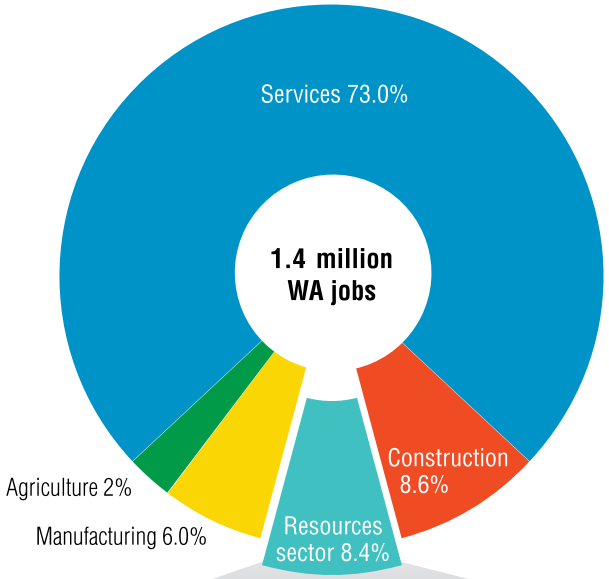
It is a workforce with skills that are applicable and transferrable to CCUS thus creating a fair transition for these workers to a lower emissions economy within WA.

Upskilling WA's workforce for the future

The study model shows the creation of CCUS hubs would directly create around 37,000 jobs in construction with a net gain of 500 direct permanent jobs. In addition, CCUS will provide more security for the existing resources industry workforce because of the options it gives to mitigate the industry's emissions.

The hubs model will also likely generate indirect jobs through the attraction of industries either to utilise CO_2 from the hub or to sequester produced CO_2 in the hub. Hubs will also support the creation of a knowledge centre for CCUS, attracting a future workforce to WA and providing pathways for fair transition to carbon neutral industries.

WA employment rates by sector



CCUS example hub effect

Currently 120,000 people directly employed in the resources sector

37,000 jobs in construction phase, 500 permanent jobs and protection of existing jobs

Indirect jobs in supporting services and co-locating industries

= 10,000 jobs

Enablers/accelerators

1. Development of a CCS knowledge hub to share expertise and technologies
2. Strategic land planning to promote opportunities for other indsutries requiring CO_2 or CO_2 storage to migrate to CCUS hubs

Protecting 120,000 jobs and creating 37,000 jobs in construction with a net gain of 500 permanent jobs.

Co-location of hydrogen production

A pathway to renewable hydrogen

Renewable (or green) hydrogen is considered important to a future carbon neutral economy. Renewable hydrogen is produced by passing a current generated by renewable energy through water. It is currently limited by the maturation timeline of the technologies and processes involved.

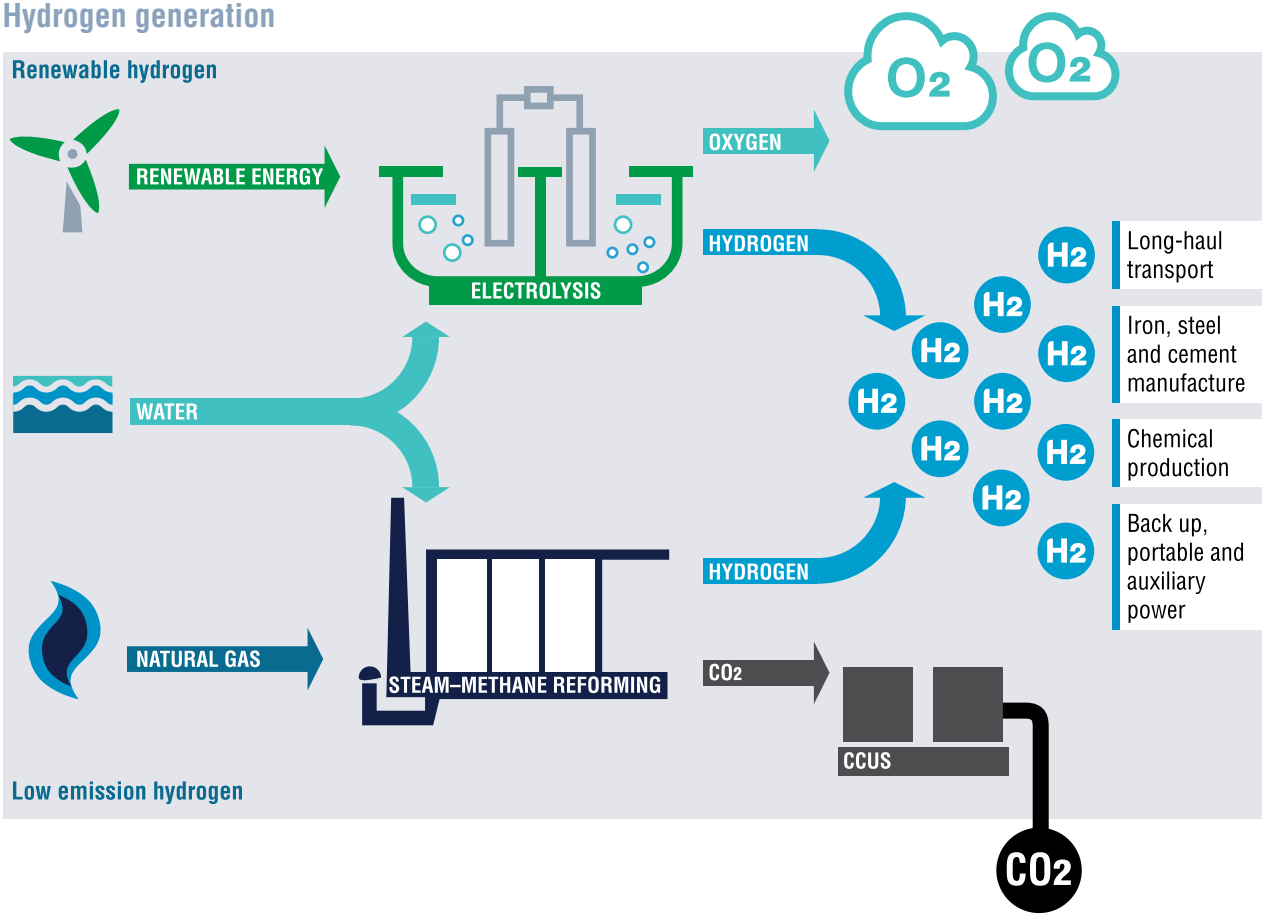
Low emission hydrogen is produced from natural gas and water with the high concentration pre-combustion streams of CO2 immediately captured and stored.

In contrast to renewable hydrogen production, the technologies and processes required for low emission hydrogen production are already mature and can enable the early development of supply chains and infrastructure critical to the transition to green hydrogen.

Domestic and export potential

This low emission hydrogen would be available to both domestic and export markets—presenting opportunities to deplace fossil fuels in otherwise hard to abate industries, and a source of export income.

Hydrogen generation



Enablers/accelerators

1. Accelerate the development of low emission hydrogen supporting the hydrogen strategy to WA
2. Strategic land planning/common use infrastructure to allow industries to locate close to potential CCUS hubs

Facilitating low emission hydrogen as a transition to a renewable hydrogen future.

Economy

The resources industry currently contributes $170 billion (47%) to the WA economy. The top three emitting industries are LNG, aluminium refining and power generation. CCUS hubs protect that economic contribution by providing abatement options and a transition pathway to a low emissions economy.

Direct benefits to the economy

The study shows that the example hub would provide an additional direct contribution of more than $55 billion to WA State GDP and a magnitude more in indirect contributions.

CCUS hubs would be a powerful attraction for global investment and enhance economic and diplomatic relationships with regional partners who have embraced CCUS as an emissions reduction method but do not have the geological conditions to undertake it themselves.

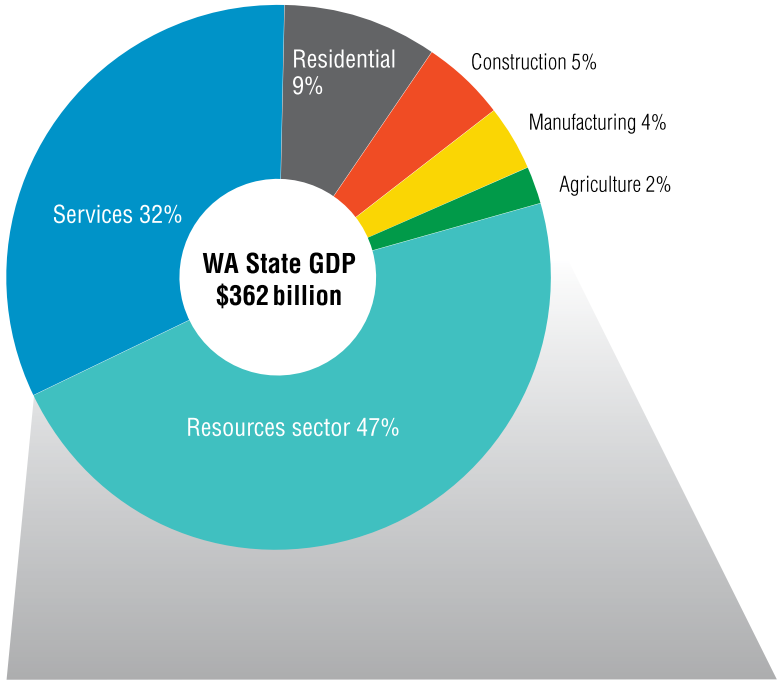
WA's potential storage capacity far exceeds its domestic needs and opening the market to the import of CO_2 would provide an income stream in taxes and revenues and elevate WA's profile as a good global citizen.

The Pilbara example modelled shows that CCUS hubs could provide CCUS of CO_2 from $70 per tonne in stage 1.

Indirect benefits to the economy

CCUS is a multi-faceted industry with revenue streams from capture and storage but also in shipping, transportation and supporting infrastructure and services.

Contribution to the WA economy



CCUS example hub effect

The resources sector currently contributes $170 billion to the WA economy

Projected direct boost from CCUS hubs

$ = A$10 billion. Cost basis: Levelised cost for value chain in AUD/Te CO_2 for 30 year project.

Enablers/accelerators

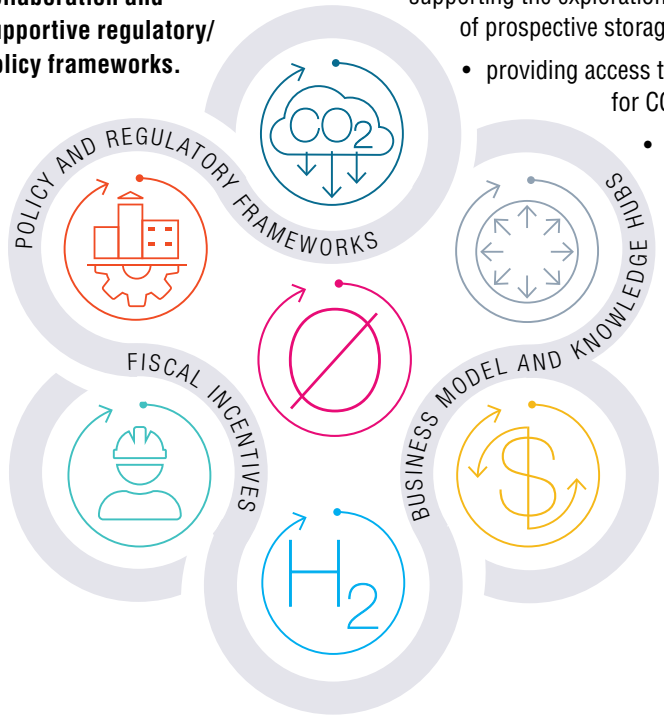
1. Create a bankable value for CO_2
2. Incentives for rapid investment to strengthen the lifecycle return to the economy
3. Embrace CO_2 shipping to develop transboundary markets
4. Enable the import of CO_2 to help fund and acelerate the development of CCUS hubs

Protecting the $170 billion contribution from the resources sector to the WA economy and boosting it by $55 billion.

Making WA a global CCUS hub

The study shows a CCUS hub concept that is not only technically viable, but able to deliver significant benefits to WA through emissions reductions, jobs, boosts to state GDP and fostering international partnerships and social license to operate.

However, like all CCUS hubs globally, WA hubs would need the right business model, appropriate governance, government–industry collaboration and supportive regulatory/ policy frameworks.



Policy

Additional policy support is essential to ensuring that Australian industry can grow and thrive in a world economy that is increasingly realigning towards a net-zero future. Ineffective policies function as barriers to investment in CCUS.

A policy framework might include:

- recognising CCUS as a component of the climate change portfolio and prioritising CCUS hubs
- coordinating CCUS development through state–federal–private partnership
- facilitating and investing in CO_2 transport and storage infrastructure
- supporting the exploration and appraisal of prospective storage resources
- providing access to low-cost capital for CCUS projects
- establishing a value on CO_2 storage.

Regulatory regime

The Commonwealth *Offshore Petroleum and Greenhouse Gas Storage Act 2006* includes CCS-specific legislation with a familiar approach to offshore operations and covers the entire project lifecycle. Whilst some provisions within it are yet to be tested it provides a basis for a more comprehensive regime which could:

- establish formal dialogue between WA and Commonwealth regulators to identify overlapping permitting responsibilities and propose necessary amendments to streamline permitting
- implement WA's proposed CCS-specific legislation and developing supporting regulations relating to permitting and approval of titles and activites
- resolve any inconsistencies between Commonwealth and state legislation
- address any provisions in wider legislation that inadvertently present barriers to CCUS projects
- synthesise the approvals pathway through Commonwealth and state legislation for CCUS projects
- support the ratification of the 2009 amendment to the London Protocol towards transboundary transportation of CO_2 for geological storage, identify key legal instruments and ensure clarity within domestic emissions accounting frameworks
- work towards certainty and clarity of liabilities within CCUS projects
- develop guidelines for developers relating to titles, permitting, approvals and compliance with new legislative requirements including for transboundary movement of CO_2.

Fiscal incentives

The ultimate goal of government support is to create the incentive for investment in CCUS now rather than to wait until the CO_2 price signal is sufficiently clear to make the investment independently. This is particularly necessary given the lead time of up to 10 years to complete a CCUS project.

Globally there are a range of fiscal incentive models in operation. These provide insight into what might work best in the Western Australian context.

Sharing knowledge, lessons, successes, and technologies

Leverage WA's extensive expertise and technologies to support further development of the CCS industry and developing a CCS knowledge hub would provide an opportunity to expedite knowledge growth and accelerate the CCUS project development necessary to the decarbonisation of industries such as cement and steel.

CCUS hub governance model

In order to realise the significant economies of scale associated with the shared infrastructure and operation of a CCUS hub, an appropriate business model is essential. The business model design would define its:

- corporate structure (e.g. joint venture, proprietory limited company, incorporated/ unincorporated etc.)
- governance principles
- purpose (e.g. scope, boundaries, objectives and how it will generate revenue/profit).

Findings

Policy

1. Recognition of CCUS in climate policy and as a part of WA's emissions abatement portfolio
2. Support the exploration and appraisal of prospective storage resources
3. Establish state–federal–industry partnership to coordinate CCUS developments
4. Establish policy settings that give investment certainty in the long term

Regulatory

1. Develop WA regulatory framework to support CCS project development including a regime to establish rights-of-way to CCUS hubs
2. Align state and federal frameworks to streamline approvals and permitting
3. Assess wider legislation implications and address any measures that inadvertently present barriers to projects
4. Establish transboundary shipping/transportation agreements to open up international opportunities
5. Develop a long-term liability regime for CO2 storage and transport

Fiscal

1. Develop a fiscal incentive model through government–industry engagement and consideration of global best practice

Knowledge sharing and skills

1. Acknowledge the role of CCUS in the fair transition of WA's workforce to a low emission future
2. Develop a CCUS knowledge hub to position WA as a global authority
3. Support the research and development into capture technologies to drive down prices

To realise the significant benefits to emissions reduction, jobs creation and state GDP that CCUS hubs would offer, we need to consider establishing a joint industry–government partnership to implement these findings at pace.

Study partners

CSIRO — Commonwealth Scientific and Industrial Research Organisation—CSIRO undertook the WA CCUS Hubs Study in partnership with GCCSI on behalf of the WA LNG Jobs Taskforce.

GCCSI — Global CCS Institute—an international think tank whose mission is to accelerate the deployment of carbon capture and storage (CCS), a vital technology to tackle climate change and deliver climate neutrality.

Study funding and SME partners

CSIRO and GCCSI acknowledge the study funding and SME partners from the WA LNG Jobs Taskforce: BP Australia, Chevron Australia, Department of Jobs, Tourism, Science and Innovation of the WA Government, Eni Australia, MIMI, Santos, Shell Australia, Woodside Energy and National Energy Resources Australia (NERA).

WA LNG Jobs Taskforce

The WA LNG Jobs Taskforce brings together industry, government and unions to collaborate on challenges and opportunities for WA's existing LNG sector, with the aim of maximising local jobs and establishing WA as a global LNG hub. The LNG Jobs Taskforce comprises the Minister for State Development, Jobs and Trade; Unions WA; Australian Energy Producers (previously APPEA); heads of Woodside Energy, Chevron Australia, Shell Australia, Santos, and INPEX Australia.

Glossary

CCS	carbon capture and storage is a process where CO_2 is captured—generally from industrial sources—compressed, then injected into deep geological formations such as depleted oil and gas reservoirs or saline aquifers
CCUS	carbon capture utilisation and storage includes where the captured CO_2 is diverted for use in other processes
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
GDP	gross domestic product
H_2	hydrogen
	renewable (green) hydrogen is produced by passing a current generated by renewable energy through water
	low emission hydrogen is produced from natural gas and water with the high concentration pre-combustion streams of CO_2 immediately captured and stored
LNG	liquefied natural gas
London Protocol	The London Protocol (1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters, 1972) outlines strict monitoring and safety measures for the transnational export and storage of CO_2. This legal framework ensures contracting parties must abide by the rules and restrictions to ensure marine protection while working towards the global energy transition
Mt/Mtpa	million tonnes/million tonnes per annum
O_2	oxygen
SME	Subject matter expert

Data sources

GENERAL

Geoscience Australia—an Australian Government agency that carries out geoscientific research. The agency is the government's technical adviser on all aspects of geoscience, and custodian of the geographic and geological data and knowledge of the nation and provided the source data on WA's CO_2 storage potential

International Energy Agency

EMISSIONS

National Greenhouse Gas Inventory

National Greenhouse and Energy Reporting

Environmental Protection Authority

SALINE AQUIFER STORAGE

Carbon Storage Taskforce 2009—National Carbon Mapping and Infrastructure Plan

SPE, 2017. CO_2 Storage Resources Management System