

Office of Energy and Climate Change

# Investing in a low carbon future for NSW industry



Net Zero Industry and Innovation  
Investment Plan

2022–2024







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**NSW Government  
to invest**

**\$360  
million**

**to deliver this plan**



**NSW's  
first**

**industrial emissions  
reduction plan**



**Reduction of**

**28  
MtCO<sub>2</sub>e**

**by 2030**

That's equivalent to  
taking 10 million cars off  
the road for a year.

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# Message from the Treasurer

NSW is well positioned to be a leading destination for low carbon investment. We have set out an ambitious and nation-leading strategy for delivering net zero emissions, backed by significant government investment in decarbonisation. The strategy includes investment to transform our electricity system through renewable energy zones, and clear targets for circular economy and transport.

As part of the previously announced Net Zero Industry and Innovation Program, NSW will provide \$360 million to fund NSW industry to accelerate decarbonisation within high emitting industries and set the foundations for new low carbon industries. This investment plan details how we will work with our partners to deliver our ambitious plan to transform and grow NSW industry while sustaining economic prosperity in the state's regions.

**“This plan signals our commitment to help industry succeed in a low carbon economy as we shift to net zero emissions by 2050.”**



To support the program's delivery, this investment plan outlines our funding priorities over the next 2 years.

It will help the deployment of clean manufacturing precincts in the Hunter and Illawarra and accelerate decarbonisation opportunities for NSW's highest emitting industrial sectors. These investment priorities will stimulate private sector investment to further drive the decarbonisation of NSW industry.

This plan signals our commitment to help industry succeed in a low carbon economy as we shift to net zero emissions by 2050.

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**The Hon Matt Kean MP**  
Treasurer and Minister for Energy

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# Overview

# Overview

## Background

For NSW to achieve net zero greenhouse gas emissions by 2050, we must accelerate decarbonisation of the manufacturing and mining sectors. This includes the supply chains that support them. While this transformation is a challenge, it is a significant economic opportunity for NSW. This is particularly important in new low carbon markets and industrial sectors that are emerging globally.

Several of the largest industrial facilities in NSW have already committed to net zero emissions. These commitments emphasise the potential for NSW to be a leading destination for low carbon investment. NSW has an advantage to attract this investment through its skilled workforce, infrastructure, abundant renewable resources and transitioning mining and coal assets.

Substantial investment is needed to achieve a net zero emissions economy, which will create huge opportunities for the manufacturing, mining and new low carbon industries. The Net Zero Industry and Innovation Investment Plan highlights how we will support these industries to reduce emissions and work together to achieve net zero.

## Objective

Our target is to achieve the reduction of industrial emissions by at least 28 MtCO<sub>2</sub>e by 2030 (7.6 MtCO<sub>2</sub>e abatement per annum in 2030). We are looking for projects that achieve significant carbon avoidance or removal through 3 investment priorities. (Figure 1).

This plan highlights how NSW Government investment will accelerate the decarbonisation of NSW manufacturing and mining sectors by capturing opportunities in the low carbon economy.

Under the investment plan, \$360 million of funding has been made available until 2030 to focus on high emitting industries and new low carbon industry foundations. This investment plan covers these 2 specific areas.

For every NSW Government dollar invested under this plan, we aim to attract \$2 to \$6 of private investment. We will support applicants who wish to access funding from other government agencies to increase the impact of their projects.





Figure 1 investment plan priorities

These priorities will be updated every 2 years to ensure our work evolves with NSW industry's approach to decarbonisation. Through these investment priorities, we aim to significantly reduce the cost of emissions reduction for industry.





# Delivering net zero industry and innovation



# Delivering net zero industry and innovation

## Overview

The NSW Government is supporting and partnering with industry to reduce emissions and help NSW businesses succeed in a low carbon world. Net Zero Industry and Innovation (NZIIP) is the flagship program to help NSW deliver 50% emissions reductions (when compared to 2005 levels) by 2030 and net zero by 2050. It builds on the [Net Zero Plan Stage 1: 2020–2030](#).

NZIIP has 3 focus areas:

- high emitting industries (HEI)
- new low carbon industry foundations (NLCIF)
- clean technology innovation (CTI).

NOTE: CTI is not within the scope of this current investment plan as the NSW Government has already separately committed funds to support the development and continued innovation of clean technologies through the CTI focus area. For more information about CTI opportunities [visit our website](#).

Figure 2 shows how these focus areas work together in covering the full ecosystem of industrial decarbonisation.

The 2 key objectives of HEI and NLCIF are to:

1. support hard-to-abate industries in NSW accelerate their transition to net zero emissions, without compromising their contribution to the NSW economy and workforce
2. develop and grow low emissions industries in NSW.

These focus areas have been designed to work together across the full ecosystem of industrial decarbonisation.

We've heard from our stakeholders that industry needs Government support throughout this entire journey. We are doing this by delivering supporting infrastructure, enabling technology and new manufacturing of low carbon and circular economy products through our NLCIF focus area. This critical work unlocks the full suite of strategic abatement opportunities, which can be implemented with the support of our HEI funding.

By investing in these major barriers to decarbonisation, we will work with industry to achieve significant emissions reductions and meet our net zero target by 2050.



# Net zero industry and innovation

Over \$1 billion to support and partner with industry to reduce emissions and help NSW businesses prosper in a low carbon world.

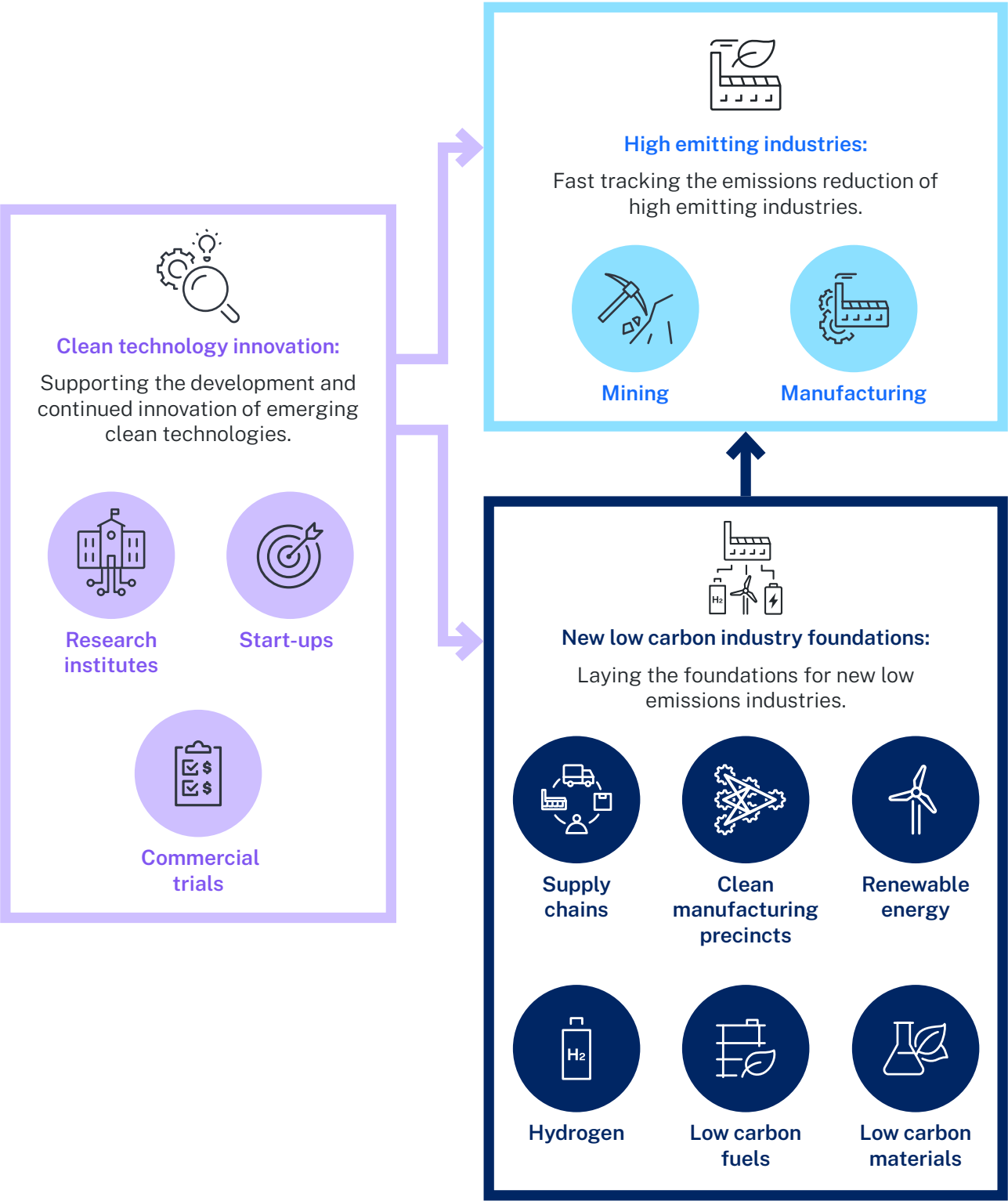


Figure 2 Net zero industry and innovation program structure



## Funding available until 2030

The following grant funding is available to industry through our investment plan:

- \$305 million to deliver abatement projects at high emitting manufacturing and mining facilities
- \$55 million to deliver clean manufacturing precincts in the Hunter and Illawarra regions, including supporting their infrastructure and supply chains.

This funding is available under the HEI and NLCIF focus areas of NZIIP. Further grant funding is available under the CTI focus area. For more information about NZIIP funding, please [visit our website](#).

Additional funding will be available under NZIIP over the life of the program. Further details will be provided in subsequent investment plans.

Please note as HEI and NLCIF are complementary areas, businesses with decarbonisation opportunities may be eligible for support under either focus area.

## Additional funding for new low carbon industry foundations

We've listened to you and provided additional funding to support regional communities.

As our coal fired power stations close, we are providing more support to diversify regional economies and create clean manufacturing jobs. We have committed an additional \$300 million to expand our NLCIF focus area and grow clean manufacturing in our state.

By co-investing in local manufacturing of emerging technologies, we will build new low carbon industries in NSW. These include:

- low emission building materials
- green chemicals
- low carbon and power-to-X fuels
- agricultural products and feedstocks
- hydrogen infrastructure, plant and equipment
- industrial by-products.

We will release additional investment priorities for this work in early 2023.



Figure 3 Additional funding for new low carbon industry foundations



# Our investment approach



# Our investment approach

## Overview

We are committed to achieving maximum impact and value when providing support and funding to industrial sectors.

## Investing in decarbonisation

One of the biggest opportunities for decarbonisation in NSW lies within the highest emitting industrial sectors. Decarbonisation of the manufacturing and mining sectors will help NSW:

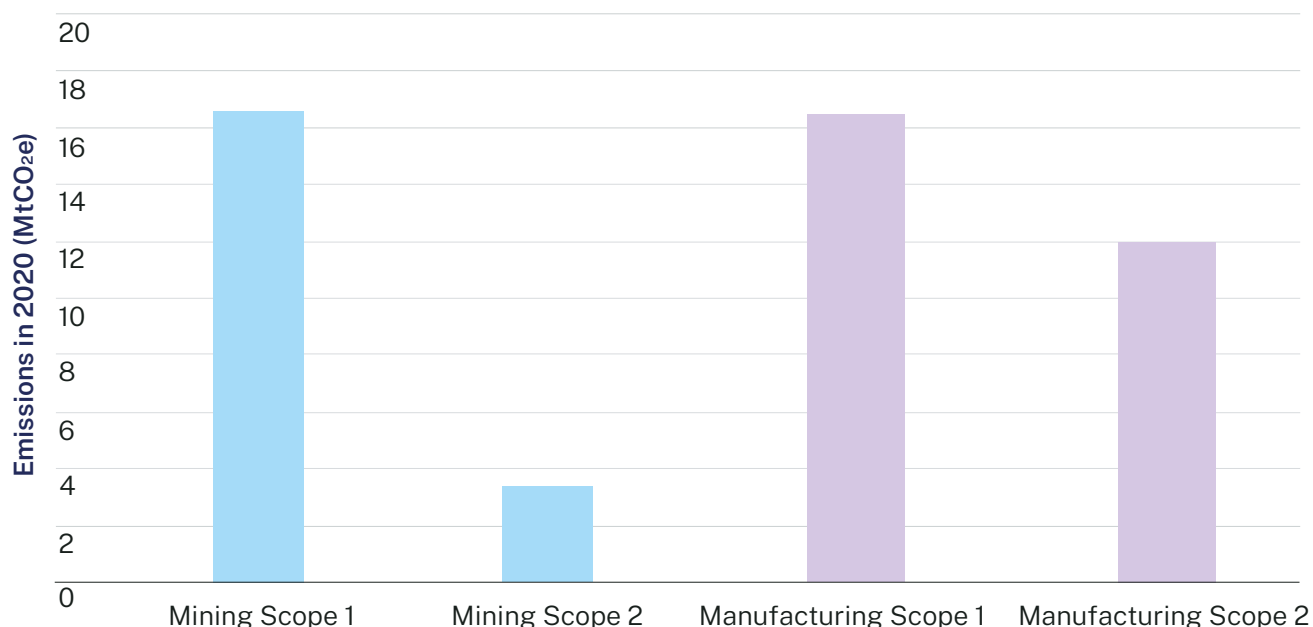
- increase productivity
- produce higher value products
- grow new low carbon industries.

The technologies required to decarbonise vary in technical and commercial maturity and often require capital-intensive, long-term investment decisions.

Our primary focus is to address Scope 1 emissions from these sectors. Scope 1 emissions include:

- stationary energy
- mobile combustion
- fugitive emissions
- process emissions.

Scope 2 emissions remain vital to address through energy efficiency measures. Most will be reduced by the decarbonisation of the electricity grid through the [NSW Electricity Infrastructure Roadmap](#). Figure 4 shows the large amount of Scope 1 emissions in the mining and manufacturing sectors.



**Figure 4** Scope 1 and Scope 2 emissions inclusive of onsite combustion, fugitive and process-related emissions captured under the Industrial Processes and Product Use category<sup>1</sup>

<sup>1</sup> Department of Industry, Science, Energy and Resources, January 2021, Australian Greenhouse Gas Emissions Information System.  
Source: National Inventory by economic sector 2020.

## Decarbonisation opportunities

We will support 4 types of decarbonisation opportunities that target significant emissions reduction.

**Quick wins:** projects ready to commence with planned commercial operation in 2022–2024.

**Mature developments:** mature projects near to financial close and planned to reach commercial operation in 2025–2028.

**Strategic opportunities:** promising projects with further studies required and commercial operation potential by 2030.

**Enabling opportunities:** projects aimed at developing low carbon infrastructure and industrial precincts to be deployed by 2030.

We plan to support a wide range of technologies. These have been highlighted alongside our investment priorities outlined on the following pages.

## Funding support

Depending on the maturity of the decarbonisation opportunity, we will support deployment or pre-deployment activities.

Pre-deployment projects aim to accelerate and bring forward deployment of strategic decarbonisation opportunities. These projects include, but are not limited to:

- late-stage feasibility studies
- commercial trials
- business case development
- front-end engineering and design.

Deployment projects aim to achieve significant decarbonisation at NSW manufacturing and mining facilities.

Figure 5 shows how the 4 types of decarbonisation opportunities relate to our investment priorities. It also provides an indication of the anticipated timing of pre-deployment and deployment funding support for these decarbonisation opportunities.





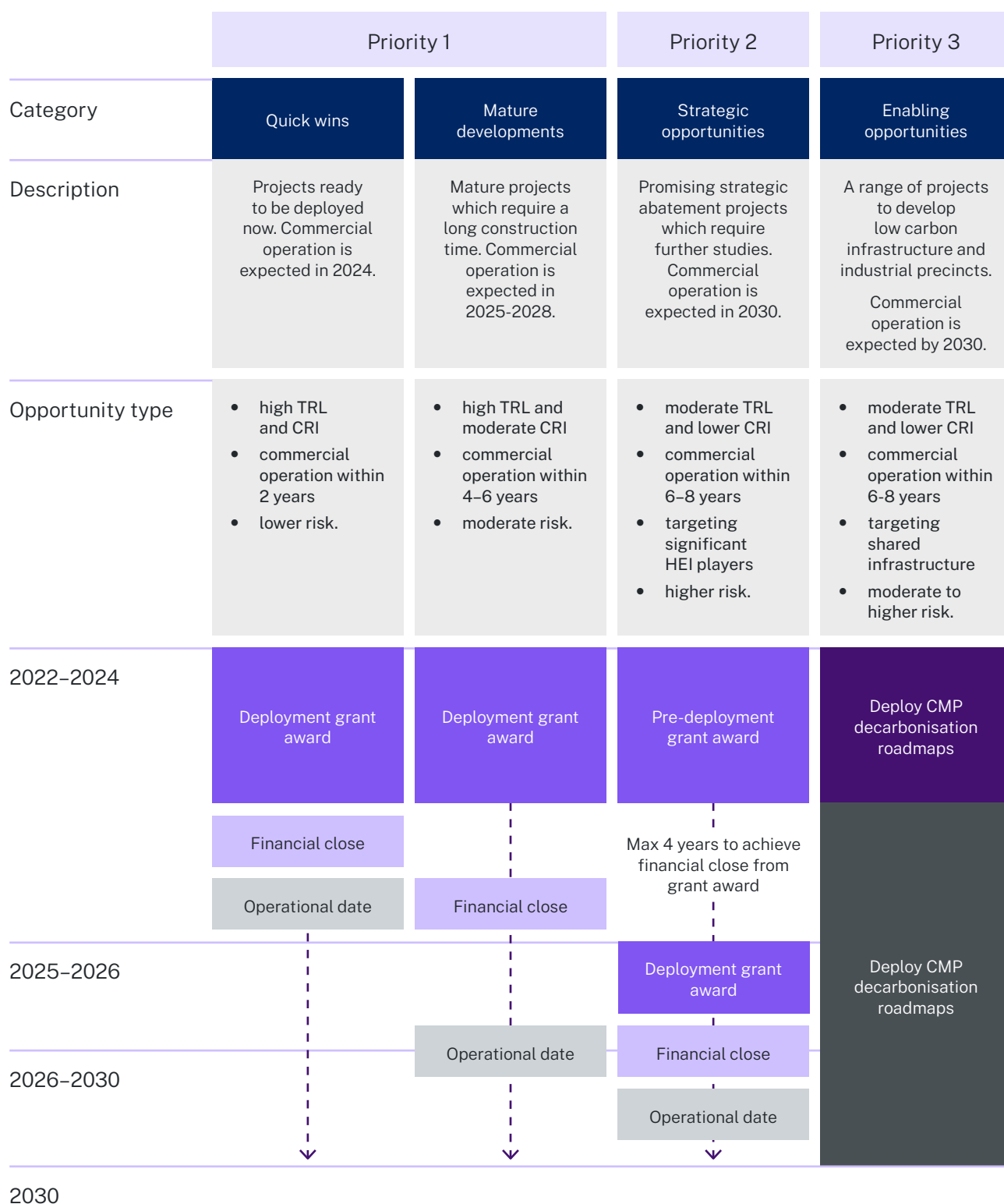


Figure 5 Project horizon for decarbonisation opportunities targeted by NZIIP



# Investment plan priorities



# Investment plan priorities




## Priorities

This investment plan provides a clear signal on investment priorities and opportunities for the next 2 years.

We have identified three priorities for this investment plan, see Figure 6.

These priorities reflect an overarching ambition to accelerate decarbonisation in this decade. This will set us up for success in the following decades leading to 2050.

Projects funded under these priorities must align with long-term decarbonisation roadmaps. These will need to be published as credible decarbonisation roadmaps for the applicants' sector, business, facility or region and include technical and/or commercial considerations for decarbonisation.

|   |  |   |
|---|--|---|
|   |    |   |
| <b>Priority 1</b><br>Deploy opportunities to reduce industrial emissions  | <b>Priority 2</b><br>Accelerate strategic abatement opportunities  | <b>Priority 3</b><br>Develop low carbon infrastructure and industrial precincts   |
| <p>Low cost, low carbon technologies are available now.</p> <p>We will work with industry to implement these opportunities and accelerate NSW's shift to a net zero carbon economy.</p> | <p>The most significant abatement opportunities for NSW industry will take time to develop and deploy.</p> <p>We will partner with industry to accelerate the implementation of these strategic emissions reduction opportunities.</p> | <p>Developing low carbon infrastructure and industrial precincts will accelerate the decarbonisation of high emitting industries and their supply chains.</p> <p>By working together, we can lay the foundations for new low carbon industries.</p> |
| *\$200 million  | \$105 million  | \$55 million  |

\*Indicative funding for each priority until 2030.

**Figure 6** Investment plan priorities and anticipated budget over the lifetime of NZIIP

## Priority 1: Deploy opportunities to reduce industrial emissions

### Overview

We will help NSW manufacturing and mining operations to deliver value for money emissions reduction projects. These new low cost, low carbon technologies are already available to help us make the shift to net zero.

Priority 1 focuses on supporting significant near-term industrial decarbonisation, operational efficiency, as well as job creation and retention. Both quick wins and mature technologies have the potential to increase industrial productivity.

Opportunities for decarbonisation under this priority are low to moderate risk and can be rapidly deployed to ensure the highest emitting industries achieve sustained emissions reductions by 2030, in accordance with our target of net zero by 2050. These technologies need to be proven at a commercial scale and align with long-term decarbonisation roadmaps.

We anticipate contributing \$200 million to Priority 1 over the lifetime of NZIIP.

### Targeted facilities

We are targeting facilities in industrial subsectors that emit more than 0.09 MtCO<sub>2</sub>e per annum, see Figure 7.

### Actions

We will provide grants to high emitting NSW manufacturing and mining facilities seeking to deploy significant decarbonisation opportunities to reduce their emissions beyond current projections.

### Outcomes

The investment plan will:

- deploy a range of opportunities, prioritising projects with emission reduction above 0.09 MtCO<sub>2</sub>e per annum
- co-fund up to \$20/tCO<sub>2</sub>e for projects with a total marginal abatement cost of greater than \$40/tCO<sub>2</sub>e
- attract \$4 to \$6 of investment from applicants or other sources for every \$1 the NSW Government provides
- support and share knowledge with the NSW community of industry participants.



### Examples of opportunities

The following are potential opportunities for decarbonisation:

- low carbon cement, including geopolymers, high-blend cementitious material and magnesium-based cement
- pre or goaf gas drainage with power generation or flaring
- co-generation with bioenergy
- biogas for process heat
- bio-coke for steel production
- bioplastics
- electric vehicles for mining
- electrification of process heat
- high efficiency electric motors
- ventilation on demand
- renewable diesel for transport
- in-pit crushing and conveying.



## Mining sectors:

|   |             |   |                  |
|---|-------------|---|------------------|
|  | Coal mining |  | Metal ore mining |
|---|-------------|---|------------------|

## Manufacturing sectors:






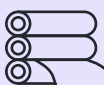
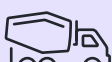

|   |                                    |   |                               |   |                            |
|---|------------------------------------|---|-------------------------------|---|----------------------------|
|    | Basic ferrous metals               |    | Basic non-ferrous metals      |  | Manufacturing - general    |
|    | Grain mill and cereal products     |    | Other basic chemical products |  | Pulp, paper and paperboard |
|  | Cement, lime, plaster and concrete |  | Glass                         |   |                            |

Figure 7 Eligible subsectors under Priority 1

## Priority 2: Accelerate strategic abatement opportunities

### Overview

We will partner with the state's highest emitting manufacturing and mining facilities to prioritise innovative and ambitious decarbonisation opportunities, to fast-track our progress to net zero.

Given the long asset lives of industrial equipment, we will invest in technical studies and commercial trials to help industry plan for long-term asset replacement.

Priority 2 will remove barriers to accelerate deployment of technologies that can significantly reduce Scope 1 emissions in this decade. By investing in these projects now, we will build the skills, knowledge and jobs to ensure NSW industry succeed in a new low carbon economy in the future.

We anticipate contributing \$105 million to Priority 2 over the lifetime of NZIIP.

### Targeted facilities

We are targeting those NSW manufacturing and mining facilities that emit more than 0.1 MtCO<sub>2</sub>e of Scope 1 emissions per annum. These facilities have the opportunity to transform the state's industrial sectors.

### Actions

To achieve this priority over the next 2 years, we will:

- work with industry to explore low carbon fuels and feedstock supply chains
- provide grants to high emitting manufacturing and mining facilities to co-fund scoping studies for transformative industry projects

- provide grants to high emitting manufacturing and mining facilities to co-fund late-stage feasibility assessments, commercial trials and front-end engineering design.

### Outcomes

The investment plan will:

- support flagship opportunities, prioritising projects with abatement above 0.3 MtCO<sub>2</sub>e per annum, to position NSW as a leader in industrial decarbonisation and enable growth via interstate and international export
- accelerate a range of strategic decarbonisation opportunities
- co-fund up to 50% of project costs with a total marginal abatement cost of greater than \$40/tCO<sub>2</sub>e
- attract \$2 to \$4 of investment from applicants or other sources for every \$1 the NSW Government provides.

### Examples of opportunities

The following are potential opportunities for decarbonisation:

- aluminium using wetted cathode and inert anodes
- direct separation and carbon capture to support low emission lime and cement
- ventilation air methane
- direct reduction of iron and electrification of plant apparatus
- green hydrogen for ammonia production.







## Priority 3: Develop low carbon infrastructure and industrial precincts

### Overview

NSW industrial regions like the Hunter and Illawarra are looking to rapidly decarbonise with many high emitting businesses and up-stream suppliers publicly committing to net zero. To enable these businesses to meet their targets through shared low carbon infrastructure, a joint effort is required within the regions.

By developing clean manufacturing precincts (CMPs) and the associated low carbon infrastructure and supply chains, we will enable the decarbonisation of high emitting industries.



Combining the efforts of businesses in industrial regions to coordinate planning and deployment of shared low carbon infrastructure:

- presents an opportunity to increase confidence in investing in foundational low carbon energy and infrastructure projects
- allows low carbon industries to develop and grow in this decade. For example, low carbon aluminium, ammonia and steel production may benefit from shared zero and low carbon energy and storage infrastructure to collectively reduce energy costs through shared hydrogen use.

We anticipate contributing \$55 million to Priority 3 over the lifetime of NZIIP.

### Actions

We have already committed to developing CMP decarbonisation roadmaps for the Hunter and Illawarra regions. To ensure we achieve this priority we will:

- co-fund the planning and pre-deployment activities (e.g. feasibility, engineering design) required to further develop long-term opportunities in the Hunter and Illawarra regions aligned to the CMP roadmaps
- co-fund the deployment of near-term opportunities in low carbon industrial supply chains and shared infrastructure projects aligned to the decarbonisation roadmaps.



## Outcomes

The investment plan will:

- develop clean manufacturing precinct roadmaps and delivery plans in the Hunter and Illawarra regions that creates a vision of a future low carbon economy setting the foundation for developing low carbon supply chains
- implement near-term opportunities identified in clean manufacturing precinct roadmaps
- support and share knowledge with the NSW community of industry participants.

## Examples of opportunities

The following are potential opportunities for decarbonisation:

- development of low carbon industrial supply chains with a focus on:
  - low carbon and power-to-X fuel hubs, including hydrogen, bioenergy, and synthetic fuels
  - behind the meter renewable energy and storage solutions for managing shared industrial loads
  - low carbon feedstock for industrial end users and industrial by-products to help support a circular economy
  - carbon management schemes such as CCUS technologies
  - low emissions building materials such as green steel, aluminium and cement
  - green chemicals, agricultural products and feedstocks.
- opportunities to deploy shared decarbonisation-driven enabling infrastructure at CMPs.





# How to get involved



# How to get involved

## High emitting industries

Funding under this focus area will open in October 2022. For more information about this funding opportunity, please [visit our website](#).

Before preparing your application for funding, please read the [HEI funding guidelines](#) and pay close attention to the eligibility and merit criteria. Please also consider the extent to which your project aligns with:

- one of the investment priorities outlined in this investment plan
- a long-term decarbonisation plan.

## New low carbon industry foundations

Funding under this focus area will open in 2023. This will align with the development of the CMP decarbonisation roadmaps for the Hunter and Illawarra regions.

We will release additional investment priorities in early 2023.







# Conclusion



# Conclusion

This investment plan signals our commitment to support high emitting industries become innovators in decarbonisation. This will allow NSW to position itself as an energy, economic and export leader, driving a clean industrial revolution for decades to come.

We look forward to working closely with industry, and helping you succeed in a low carbon economy. Together we can protect jobs, grow business and achieve our target of net zero emissions by 2050.





# Terms and definitions



## Terms and definitions

The following terms are used throughout this investment plan.

|                          |   |
|--------------------------|---|
| <b>Abate(ment)</b>       | To reduce (emission reduction)  |
| <b>CCUS</b>              | Carbon capture, utilisation and storage   |
| <b>CMP(s)</b>            | Clean manufacturing precinct(s)   |
| <b>CRI</b>               | Commercial readiness index  |
| <b>CTI</b>               | Clean technology innovation   |
| <b>Decarbonisation</b>   | Removal or reduction of carbon dioxide  |
| <b>Deploy(ment)</b>      | To rollout, implement or install (implementation)   |
| <b>Fugitive emission</b> | Losses, leaks and other releases of gases, such as methane and carbon dioxide (CO <sub>2</sub> ), to the atmosphere that are associated with industries producing natural gas, oil and coal |
| <b>HEI</b>               | High emitting industries  |
| <b>MtCO<sub>2e</sub></b> | Megatonnes of carbon dioxide equivalent   |
| <b>NLCIF</b>             | New low carbon industry foundations   |
| <b>NZIIP</b>             | Net zero industry and innovation program  |
| <b>Power-to-X</b>        | Processes and technologies that convert renewable energy and sustainable materials into power fuels and clean chemicals   |

|                   |  |
|-------------------|--|
| Scope 1 emissions | Emissions as a direct result of an activity, or series of activities at a facility level |
| Scope 2 emissions | Emissions from the indirect consumption of an energy commodity                           |
| TRL               | Technology readiness level   |





**For more information**

For more information about Net Zero Industry and Innovation and our investment plan, [visit our website](#) or email us at [netzeroindustry@environment.nsw.gov.au](mailto:netzeroindustry@environment.nsw.gov.au).