Transport Infrastructure Decarbonisation Strategy

2024

VICTORIAN INFRASTRUCTURE DELIVERY AUTHORITY

VICTORIA'S BIG BUILD

VICTORIA State Government

Mooroolbark station, Manchester Road level crossing removal project.

Contents

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Taking action

The importance of action to address climate change can not be overstated.

As part of a global pledge to reduce carbon emissions and avoid the worst impacts of climate change, the Victorian government has committed being net zero by 2045.

Backed by legislated targets, Victoria's transition is underway with significant investment in renewable energy, new transmission lines and energy efficiency initiatives.

However, we know that all sectors of our economy must adapt and the Victorian Infrastructure Delivery Agency has a responsibility, and importantly the skills, to demonstrate strong action to decarbonise the transport infrastructure we build.

The unprecedented investment in our transport sector is both a source of our emissions and an opportunity to put in place measures to reduce the footprint of construction, both within our portfolio and beyond.

We can leave a lasting legacy, helping to transition the industry to a net zero economy, supporting job creation and new industries.

Our *Transport Infrastructure Decarbonisation Strategy* sets out our commitments within two distinct streams:

1 - Decarbonise our corporate operations, and

2 - Decarbonise our transport projects in line with the Climate Change Act and net zero 2045 ambitions.

Our focus will centre on driving efficiency, value engineering and seeking to reduce emissions through smart decision making.

We will continue to support innovation in our industry, driving down the emissions associated with our materials and construction techniques.

We recognise that we do not act alone. To be successful will require collaboration and coordination from government and asset owners, the construction industry and supply chains.

Work has already begun, but through this strategy we have now identified clear and deliberate actions we will take to support Victoria's journey to net zero.

Acknowledgment of country

VIDA acknowledges the traditional owners of the lands on which we operate, who have cared and sustainably managed Victoria's land and waterways for tens of thousands of years.

We recognise Aboriginal people as Australia's first peoples and the Traditional Owners of this land. We thank them for their ongoing contribution to our projects through the sharing of their knowledge of their cultural heritage and pay our respects to elders past, present and emerging.

Image: Site solar array at the Princes Highway East – Kilmany upgrade project.

Targeted action

To tackle the extraordinary challenge of climate change, Victoria was one of the first jurisdictions in the world to put a net zero emissions target in law.

In 2023, the Victorian Government brought forward the commitment to achieve net zero from 2050 to 2045.

Victoria exceeded its first interim target – to reduce emissions 15-20% below 2005 levels by 2020 – with a cut of almost 30%. Building on this success, the Victorian Government has set targets that provide a clear path to net zero emissions, most recently with the 2035 interim target of 75-80% reduction compared to 2005 levels.

These targets place Victoria alongside international climate leaders and will bring real benefits for Victorians, including new jobs, energy bill savings, improved health and environmental outcomes. They represent Victoria playing its part in global efforts to limit warming to 1.5°C by the end of the century to avoid the worst impacts of climate change.

It will be difficult to eliminate all upfront carbon emissions from the transport infrastructure sector. However, relying on offsets alone is not a viable or value for money solution.

Offsetting the residual carbon from our works completed to date, would require an investment of hundreds of millions of dollars. Australian carbon credits in 2024 are trading at around $35/t CO_2-e. As we approach net zero target dates, the cost of offsets are likely to be even higher. Therefore, we need to focus now on investing in low carbon technologies, materials and construction methods to make these accessible and ultimately enable more cost effective emissions reduction.

Significant progress is expected across sectors of the economy responsible for the majority of Victoria's emissions, including energy, transport users, agriculture and land use. However, to achieve the State's net zero ambitions, reductions in these sectors alone will not be sufficient – the response must be whole-of-economy and the transport infrastructure sector will also play an important role.

Glossary Terms

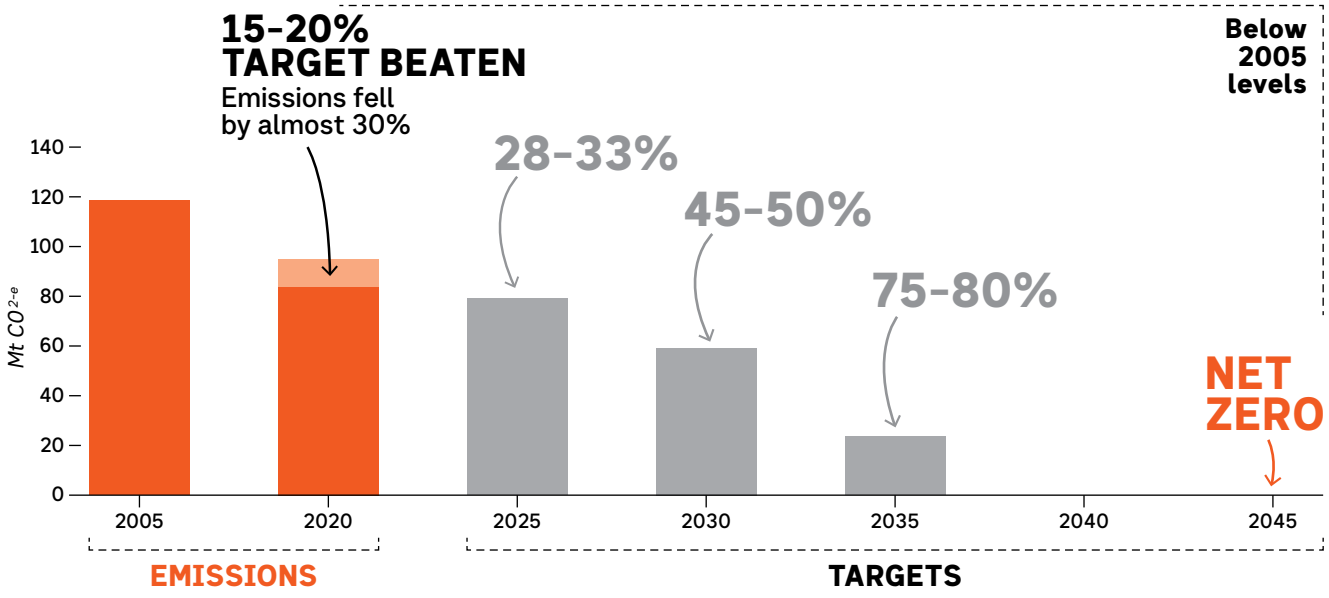
Carbon emissions

The term used to refer to emissions of greenhouse gases, typically from burning fossil fuels, industrial processes and land clearing.

Carbon offsets

This means to compensate for the emissions from a facility or activity by removing or reducing emissions elsewhere. Offsets are typically traded and purchased as credits.

Victorian Climate Change Act targets and progress



The role of VIDA

The Victorian Infrastructure Delivery Authority has been established to oversee an unprecedented level of investment in new tunnels, freeways, arterial road upgrades, level crossing removals and health infrastructure for the State of Victoria.

VIDA was formed in 2024, bringing together the Major Transport Infrastructure Authority and the Victorian Health Building Authority. This strategy covers our transport infrastructure projects only.

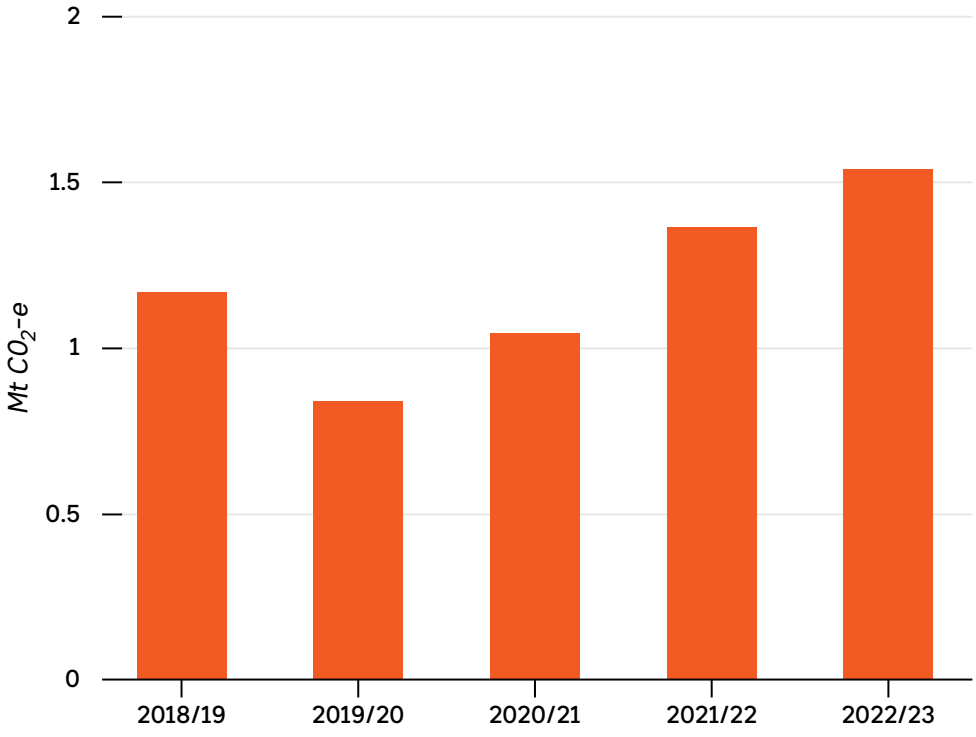
The Authority, via distinct projects offices, is responsible for projects from business case development, through to procurement and delivery.

Projects delivered by VIDA are then handed over to asset owners, who are responsible for operation and maintenance.

Excluding our relatively small corporate emissions, the upfront carbon emissions of our transport projects are determined by two main factors:

- the carbon intensity of our projects; and
- the volume of work undertaken.

The significant increase in the number and size of transport infrastructure projects being undertaken in Victoria over the last decade has come with an associated carbon footprint.

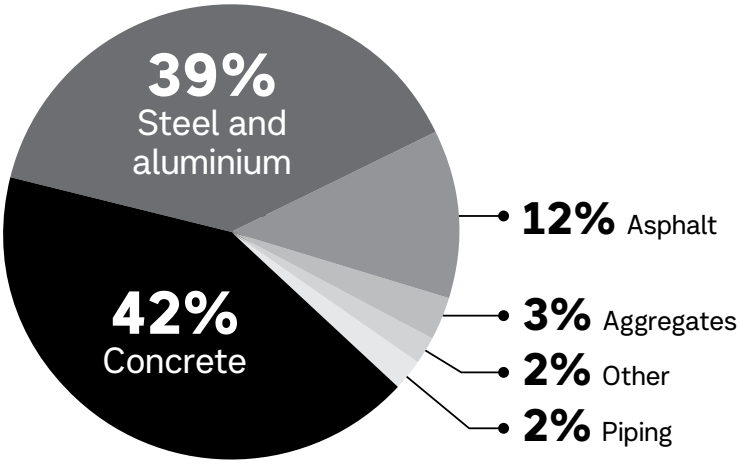


VIDA's transport project emissions are closely linked to the volume of work undertaken. To estimate the emissions footprint, benchmarks have been developed using known data on materials and energy use and capital expenditure.

In 2022/23 it is estimated, based on carbon intensity benchmarks and capital expenditure, that VIDA's road and rail projects accounted for around 1.5 Mt CO_2-e of upfront carbon emissions.

This figure excludes emissions associated with operations and maintenance of the assets.

VIDA's emissions will vary depending on the number and scale of projects being delivered, so we need to focus on reducing the carbon intensity of our works.



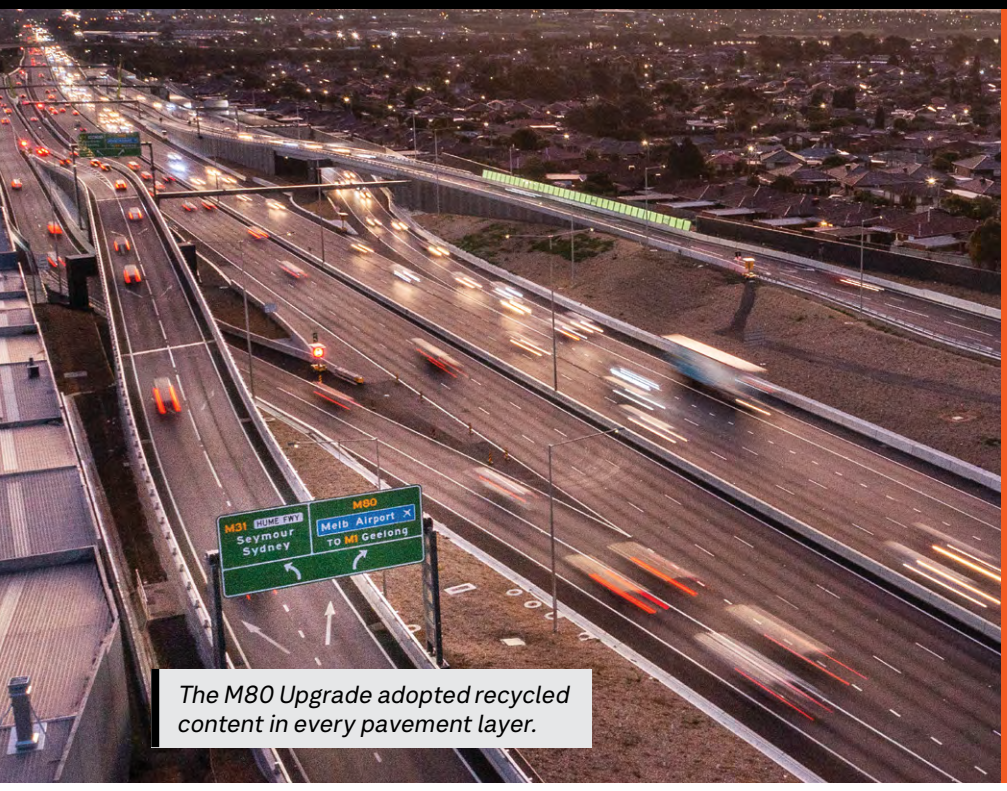
Analysis of our transport projects shows that materials comprise around:

77% of the upfront carbon footprint with the remaining

23% coming from the energy and fuels used in plant and equipment.

This will vary from project to project with some having very high energy demand, such as those with tunnel boring machines, where the energy may comprise more.

For materials, around **39%** of emissions are related to steel and aluminium and **42%** in concrete and cement products.



The M80 Upgrade adopted recycled content in every pavement layer.

Glossary Terms

Upfront carbon

The carbon emissions caused before the asset is operational, inclusive of manufacture of the materials, transport to site and the actual construction of the asset/ infrastructure including land clearing and the energy used in plant and equipment and site facilities.

The early stages of decarbonisation

VIDA's transport projects have been implementing a range of opportunities to reduce their carbon footprint and we know significant reductions can be achieved where the contractual mechanisms, supports and incentives are in place.

1 RECYCLED FIRST POLICY

The Recycled First Policy was introduced in 2020 and has resulted in a substantial increase in the volumes of recycled content in road and rail projects. Preferencing recycled materials over virgin materials often delivers lower emissions.

VIDA created a new body named ecologiQ to support the implementation of the recycled first policy by offering technical leadership, education and resources, connecting contractors with suppliers and supporting research and innovation.

ecologiQ®

The recycled first policy and the work undertaken by ecologiQ to support the implementation has clearly resulted in emissions reductions, however fully quantifying the benefits of the sector is challenging due to the variable sources and nature of recycled materials – this is subject to ongoing investigations and research.

Since its introduction projects have utilised:

> 245,000 t
of reclaimed asphalt pavement (RAP)

→ **Saving approximately**
7,500 t CO_2-e
(compared to 100% virgin bitumen asphalt)

> 748,000 t
of recycled crushed concrete and masonry

→ **Saving approximately**
4,300 t CO_2-e
(used in place of crushed rock)

Image: Asphalt products with high recycled content.

2 LOW CARBON MATERIALS

Our transport projects are using numerous low carbon materials and solutions. This includes recycled materials and substituting carbon intensive materials for lower carbon alternatives.

Concrete, as one of our most significant materials, has had particular focus. Trials of low carbon concrete applications require engagement with numerous parties to ensure the end product is safe and durable and meets all performance requirements.

Through a dedicated working group, collaboration with asset owners, delivery partners and research organisations has led to the development and implementation of new and innovative concrete mixes.

VIDA will look to build on this success and expand out to other materials through the development of industry-specific pathways.

3 RENEWABLE ENERGY AND ELECTRIFIED PLANT AND EQUIPMENT

The use of solar and battery systems to power site compounds and other static plant such as light towers is becoming common, however we are still reliant on diesel generators for the majority of sites.

Projects are using biodiesel but generally in limited circumstances. More widespread adoption of these fuels, particularly in high percentage blends will help to reduce emissions further.

Progress in the UK and parts of Europe has shown that many construction sites can be powered by 100% renewable fuels, with no blending required. This results in emissions savings of over 80%, together with improved air quality outcomes.

Fully electric plant is becoming more available, however options are still limited and as demand increases globally we expect to see supply and lead time challenges.

Hybrid plant has been available for a number of years and increased uptake on our projects will help to improve fuel efficiency while the transition to fully electric plant takes place.

Glossary Terms

Carbon footprint

The general term to refer to the amount of emissions associated with an asset or activity.

Carbon Dioxide Equivalent (CO_2-e)

There are many greenhouse gases, the most common being carbon dioxide. Greenhouse gases all have different warming properties. CO_2-e is a standard unit of measurement that converts these gases to a carbon dioxide equivalent, which is measured in kilograms or tonnes.

Decarbonisation

The process and measures to reduce the carbon emissions intensity of our activities and assets.

Looking to the future

There are many existing technologies that are being further developed and new solutions are on the horizon.

Establishing industry-specific decarbonisation pathways will assist to support these new and emerging technologies, such as electrified plant, 100% renewable fuels, green hydrogen, very low and ultra low carbon concrete and low carbon steel.

Supporting the evolution of standards and specifications to allow increased recycled content and new and innovative materials will also be key.

Enhancing our systems and processes will drive efficiency and value. Putting in place a carbon management system aligned to international best practice, such as the Publicly Available Standard (PAS) 2080, and valuing carbon in our decision making will be a significant step.

Ensuring consistent carbon metrics are included in the development of digital engineering tools and working with the Victorian Transport Digital Engineering Transformation Project will help to streamline carbon measurement and analysis.

We need to build clever and build efficiently, utilising low carbon materials, optimising the use of recycled material, through the Recycled First Policy.

We need to also recognise that our ability to reduce carbon decreases dramatically as we move through the project lifecycle, ultimately not building new infrastructure or retrofitting existing infrastructure is the most impactful thing we can do.

Following on from this we need to build clever and build efficiently, utilising low carbon materials, optimising the use of recycled material, through the *Recycled First Policy* and by embracing new technology and modern methods of construction.

Glossary Terms

PAS 2080

PAS2080 is a global standard for managing carbon in buildings and infrastructure. It looks at the whole value chain and aims to reduce carbon and cost through intelligent design, construction and use.

Image: Arden Station, Melbourne Metro Tunnel Project. The project adopted recycled glass sand in concrete as well as reducing Portland cement across the tunnels and stations by 52%.

1 Our commitments

Decarbonise our corporate operations

While VIDA plans and delivers major transport infrastructure, we do not operate or maintain these assets and therefore our corporate emissions result from our light vehicle fleet, offices and other purchases, such as business travel.

Many of our offices are already on renewable energy tariffs. In line with the Victorian Government's pledge to source all electricity from renewable sources for Victorian Government operations, we will transition all of our offices over to 100% certified renewable electricity by 2025.

> We will review all offices and sites to determine charging facilities and look to transition our light vehicle fleet over to zero emissions vehicles (ZEV).

We will offset business air travel, using reputable offsets, from 2025.

CORPORATE OPERATIONS DECARBONISATION PLAN

CORPORATE OPERATIONS DECARBONISATION TARGETS

2024

2025

- All offices transitioned to **100%** certified renewable energy supply agreements
- **100%** of business air travel is offset

ACTIONS

- Audit of all VIDA offices and energy supply agreements
- Review charging infrastructure at all VIDA offices and sites
- Commence negotiations with fleet managers and building managers
- Agree on appropriate offsets for business travel – aligned to VIDA offsetting guidance
- Identify suitable equivalent ZEVs to replace existing fleet
- Investigations into support for charging infrastructure at non VIDA facilities
- ZEV transition plans developed

2026

- **20%** of new and lease renewals for light vehicles are ZEV where charging infrastructure permits

2028

- **50%** of new and lease renewals for light vehicles are ZEV where charging infrastructure permits

2030

- **100%** of new and lease renewals for light vehicles are ZEV where charging infrastructure permits

Image: Electric vehicle charging.

2 Our commitments

Decarbonise our projects

VIDA is committing to decarbonising our transport projects in line with the Climate Change Act and net zero 2045 ambitions, through the following initiatives:

Emissions reduction targets

All delivery partners will be required to demonstrate through the tender process and during delivery how they will support VIDA to reduce emissions in line with this strategy.

New projects of $50 million in capital expenditure and above (excluding State Owner costs) will also have emissions reduction targets.

In order to permit tracking towards net zero, these will be measured by comparison to a project baseline, closely aligned to construction practices and materials from 2005. This will ensure all projects are measured from a common reference point. These targets will apply to 'up front carbon', which includes the carbon associated with raw material supply, transport, manufacturing and construction activities.

This will set us on a pathway for projects to be net zero emissions by 2045, with offsets only considered once all reasonably practicable steps have been taken to reduce emissions.

Progress and targets will be reviewed and will consider past performance, new information such as technological developments and any policy or guidance from the Victorian and Australian Governments, such as sectoral emissions reduction pathways.

Developing a carbon management system and valuing carbon in decision making

VIDA will develop carbon management guidance for Project Offices, informed by PAS 2080. Aligning our approach to PAS 2080 will require a strong leadership commitment and will take time to establish.

To assist this, an in-depth review of current practices and how and where VIDA Project Offices' current management systems can be improved will be undertaken. This will include putting in place robust systems to harmonise data collection between project offices and the development of processes to capture, track and analyse this information.

> Guidance materials to assist decision makers and project managers will be developed, including a common methodology for carbon assessment and, where absolutely necessary, the procurement of offsets. This will align to national guidance currently under development by the Commonwealth, States and Territories.

Why focus on upfront carbon?

Although VIDA's constructed transport assets have an operational footprint, either through the energy used, maintenance activities or enabled emissions resulting from use (for example vehicles), VIDA are only directly involved in the procurement, design and construction of these assets.

These operational and enabled carbon emissions are important and PAS 2080 is a standard that considers whole-of-life carbon. Our projects will still continue to investigate and pursue low energy and energy efficient designs and will ensure lifecycle impacts are considered when designing assets.

However, we acknowledge there is significant investment and effort being made elsewhere in our economy to decarbonise our energy systems and transition to zero emissions vehicles. At the present time, we believe tackling our upfront carbon emissions is where we will have the most ability to make an impact.

Image: Electric piling rig.

This approach will align with the Victorian Governments Digital Strategy and the Victorian Transport Digital Engineering Project to ensure a consistent approach to measuring and reporting on carbon.

With carbon data captured in design drawings in the digital model, hotspots will be easily identified, reporting will be simplified and subsequently betters decisions can be made.

It is well known that the opportunities to reduce emissions are most pronounced early on in project development. Our management systems will seek to align with industry best practice and include carbon in all stages of decision making, from business case through to completions. This will include the use of carbon values in cost-benefit-analysis at the business case stage to inform optioneering and scope development.

> In 2024 Infrastructure Australia published the national carbon values for use in cost benefit analysis.

Partnering with industry

We will undertake consultation with supply chains to develop industry-specific decarbonisation pathways.

This includes working with our most significant material supply chains, such as concrete, steel and asphalt and targeting emissions resulting from the energy and fuels used on our projects.

We will continue the work to support low carbon material applications and trial these where safe to do so, working closely with asset owners to develop new standards and specifications.

We will support and encourage the transition to zero emissions construction sites by 2045, targeting site compounds, static and mobile plant. Through the ecologiQ team and Recycled First Policy VIDA will continue to drive uptake in recycled and repurposed materials and the adoption of circular economy principals.

Training and knowledge sharing

Decarbonisation of the transport infrastructure sector will require behavioural change and education.

The ecologiQ program has demonstrated how this can be effectively done. Education is provided through knowledge sharing sessions, events, visual and technical guides. ecologiQ have also connected suppliers and projects, helping to transition recycled and reused products and solutions into project delivery.

We will leverage this knowledge base, together with initiatives such as industry working groups to facilitate and accelerate the uptake of low carbon materials.

> Key to this is providing useful information to decision makers – ensuring that those designing and procuring have appropriate tools to make informed choices.

While sustainability teams are often the subject matter experts, its important to acknowledge the critical role that engineers play in delivering decarbonisation outcomes.

Sustainability professionals have a responsibility to educate and empower engineers and others to make informed decisions.

To support the implementation of this strategy, dedicated training programs will be provided to support both VIDA employees and project teams.

This will include mandatory training for specific job roles on decarbonisation opportunities (procurement, design, engineering) as well as short courses and targeted information to support decision making.

A knowledge sharing platform will be developed to provide VIDA and industry with a resource and industry forums will be continued to further share information, showcase innovation and facilitate connections.

Finally, we will work with other government departments and jurisdictions to collaborate and share information.

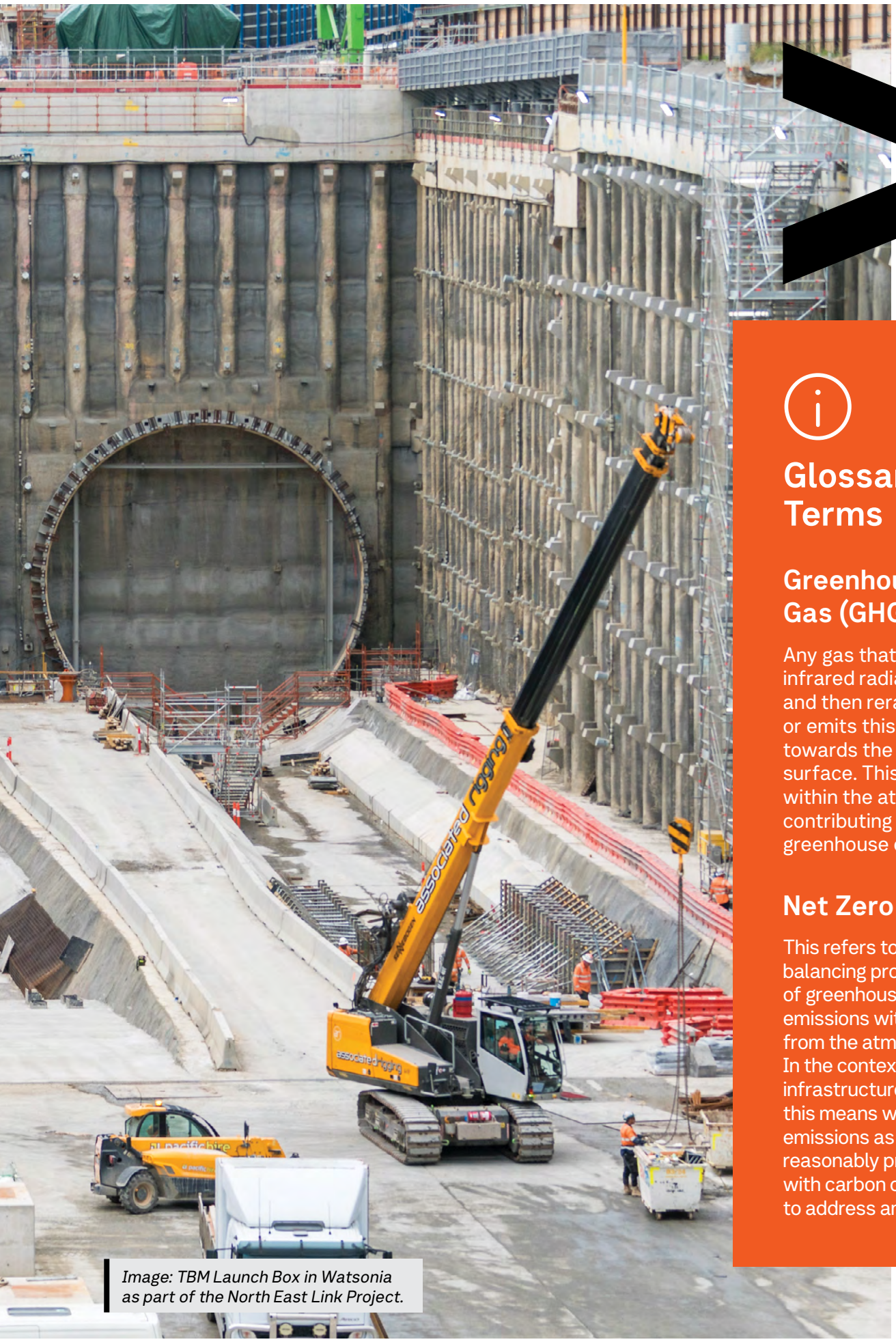


Image: TBM Launch Box in Watsonia as part of the North East Link Project.

Glossary Terms

Greenhouse Gas (GHG)

Any gas that absorbs infrared radiation and then reradiates or emits this back towards the earth's surface. This traps heat within the atmosphere, contributing to the greenhouse effect.

Net Zero

This refers to balancing production of greenhouse gas emissions with removal from the atmosphere. In the context of infrastructure delivery, this means we reduce emissions as far as reasonably practicable with carbon offsets used to address any shortfall.

PROJECT EMISSIONS DECARBONISATION PLAN

	2024	2025
PROJECT DECARBONISATION TARGETS		Newly procured projects target **28%** reduction in up front carbon emissions*
ACTIONS – CARBON MANAGEMENT SYSTEM AND VALUING CARBON IN DECISION MAKING	– Review of existing management system processes and alignment to PAS 2080 commenced – Development of VIDA carbon management and assessment guidance commenced – Engagement with the Digital Engineering Transformation Project – National carbon values (or higher) included in cost-benefit analysis for all business cases seeking $250M or more in Commonwealth funding	– Projects prepare carbon management plans – Development of carbon management systems commenced – Determination of application of carbon values in cost-benefit analysis for all business cases – Identification of key actions to integrate carbon assessment into digital engineering
ACTIONS – PARTNERING WITH INDUSTRY	– Supply chain consultation to support industry pathways commenced – First projects to trial electrified heavy plant. Very low carbon concrete trials, including structural applications – Continued work with asset owners to review standards and specifications	– Development of a net zero materials implementation plan – Development of industry-specific pathways for key materials commenced: concrete, steel, asphalt, plant and equipment – Continued trialling of new materials and applications – All mains electricity procured directly by projects is from 100% certified renewable sources
ACTIONS – TRAINING AND KNOWLEDGE SHARING	– Training gap analysis undertaken – Development of knowledge sharing resources commenced – Collaboration with Commonwealth, States and Territories on application of national values for carbon, harmonised methods of carbon measurement and policy levers	– Development of training resources and guidance – Training programs rolled out – Continued collaboration with other jurisdictions

** compared to a 2005 project equivalent.*

2026	2027	2030	2035	2045
	Newly procured projects target **35%** reduction in up front carbon emissions*	Newly procured projects target **45%** reduction in up front carbon emissions*		Projects are **net zero**. Emissions are reduced as low as reasonably practicable with offsets for the residual
– Progress review. Confirmation of 2027 target – VIDA carbon offset guidance prepared	– Systems aligned to international standards, developed and in place – Progress review. Confirmation of 2030 target	– Progress review. Confirmation of 2035 target	– Progress review	– Progress review – Offsets considered only when all other avenues exhausted
– Continued industry engagement and review – Carbon intensity targets for concrete, steel and other key materials established – Contracts to include minimum renewable fuel and electric plant targets		– Static plant and site facilities are zero emissions – Review mobile plant and equipment targets		– Mobile plant and equipment are zero emissions