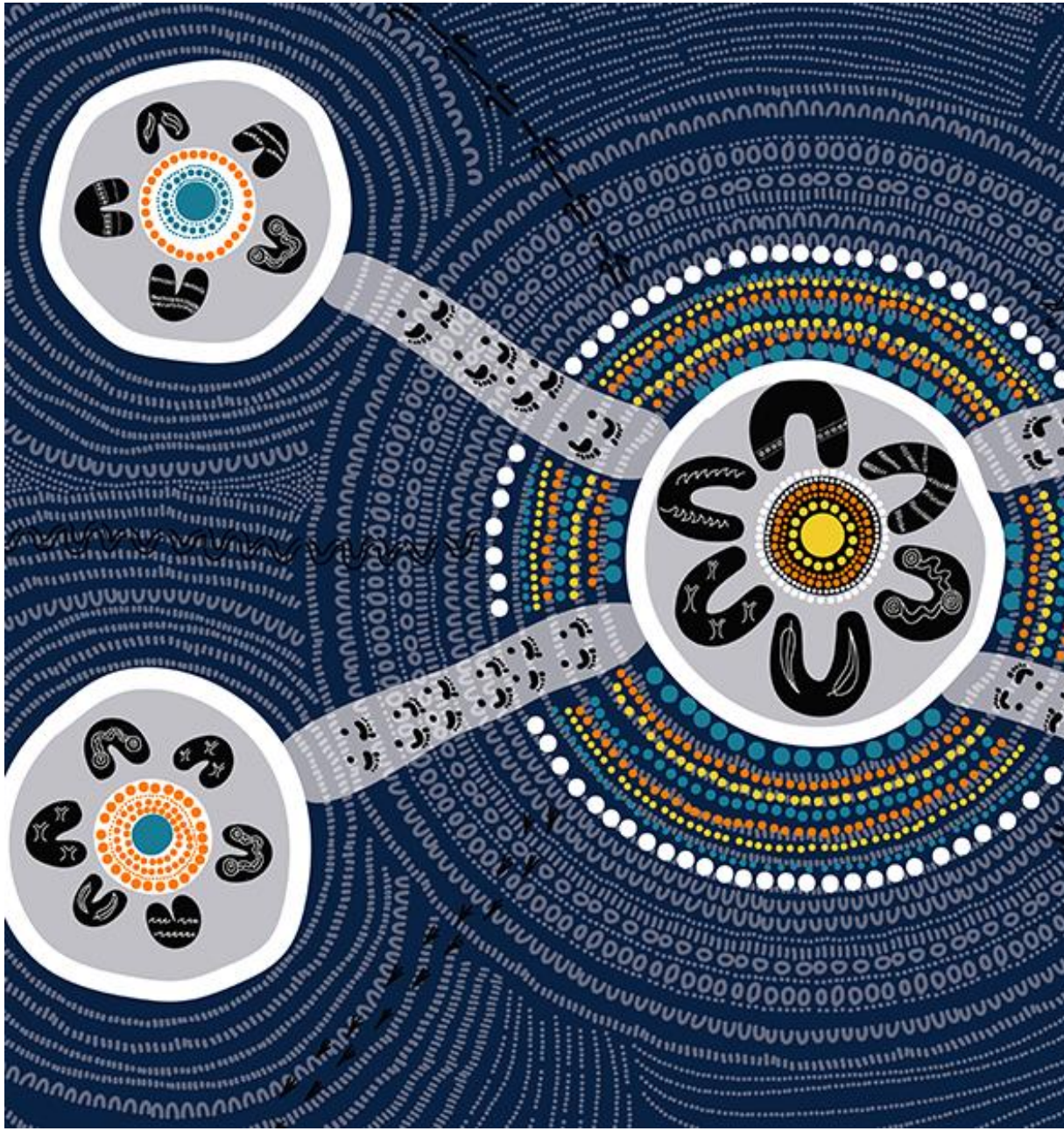
Infrastructure Sustainability Council

Suppliers in the Spotlight

30 January 2024

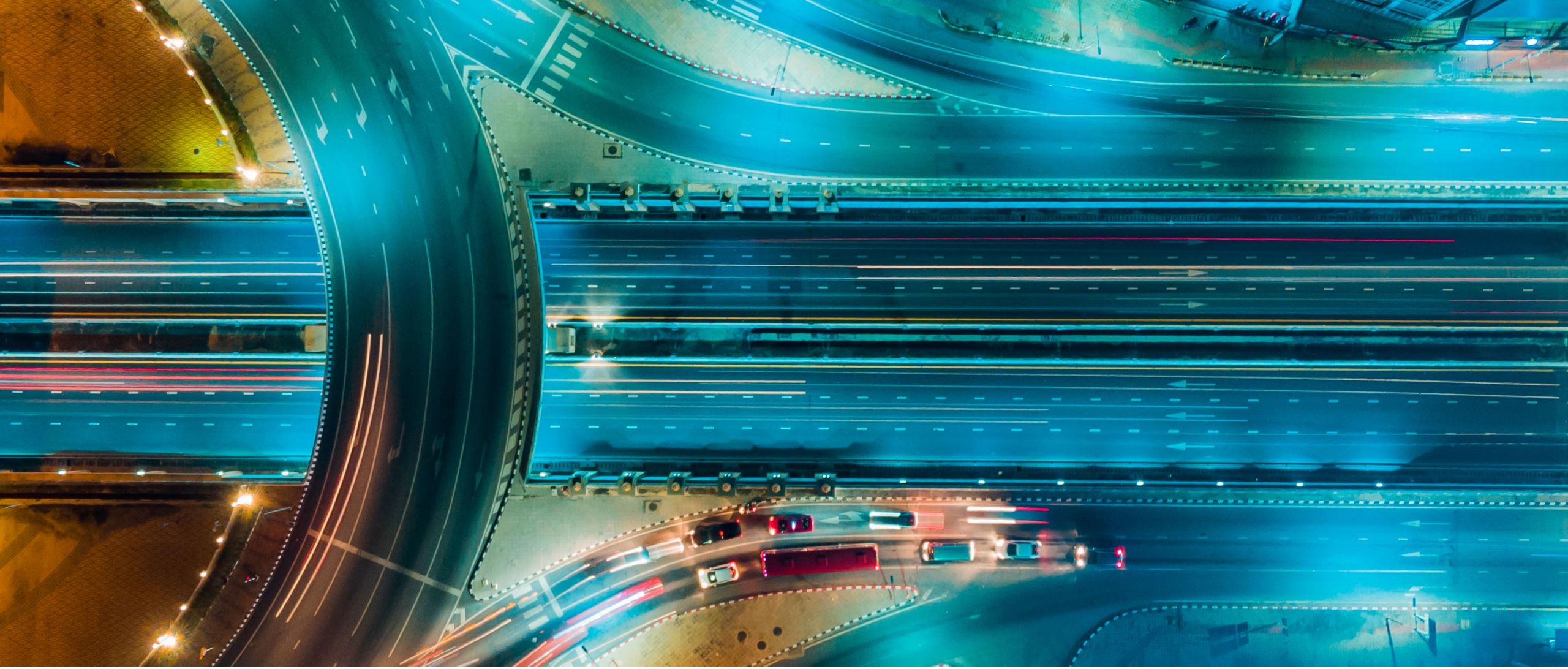
Acknowledgement of Country

The Infrastructure Sustainability Council would like to begin by acknowledging the Traditional Custodians of the land on which we meet today. I acknowledge their deep connection to land, water and culture, and pay my respects to their Elders past and present.



Agenda

1	**361 Degrees Strategic Engagement and Communications** Jamie Robertson
2	**BINGO Industries** Tara Osborne
3	**Ziger Energy** Yuchen Xu
4	**Reynard Wood** George Reinke
5	**Cerclos** Morgan Ledger
6	**Geofabrics** Ryan Hackney



361 Degrees Strategic Engagement and Communications

Jamie Robertson

Delivering Sustainability Through Project Communications

ISC Supplier Webinar 30 January 2024

361° Strategic Engagement & Communications

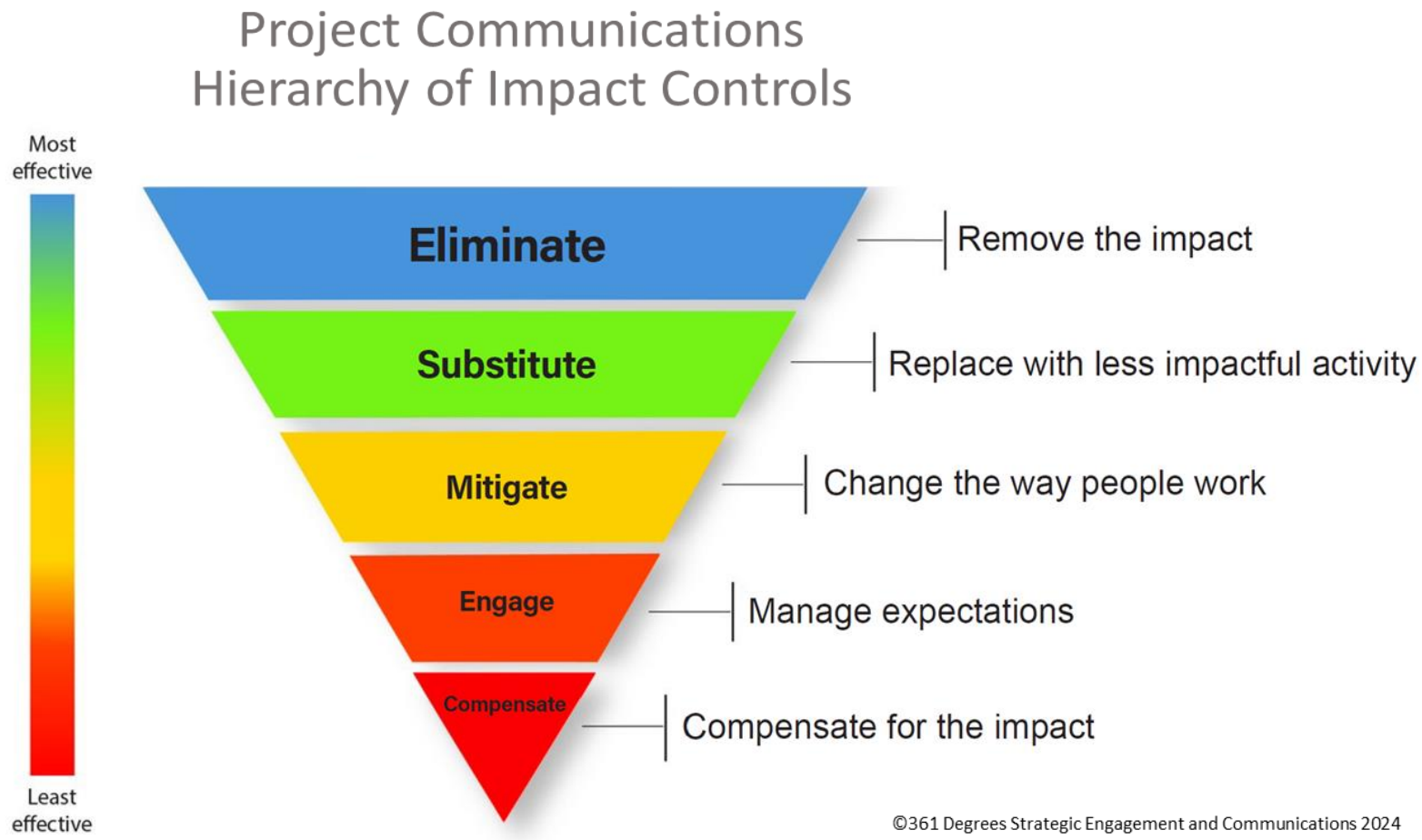
361 Degrees

- Certified B Corporation – a sustainable company committed to the delivery of sustainable projects.
- 20+ years managing project communications in resources and infrastructure environments including telecommunications, rail, roads and ports.
- Continuous involvement in the delivery of Sta ratings dating back to the early days of ISC.

Our approach

- Extensive internal library of guidance notes covering all aspects of project communications in civil infrastructure.
- Apply Community-in-Design principles.
- Create decision-making pathways within the project to encourage leadership to consider stakeholder feedback and manage social risks.

We are different because…



Bingo Industries

Tara Osborne

Driving towards a circular economy

BINGO is the largest producer of recycled products along the East Coast of Australia producing ~900,000 tonnes of materials that go back into the circular economy. We work with our customers to achieve their sustainability targets. BINGO is wholly owned by Macquarie Asset Management.

MACQUARIE | BINGO INDUSTRIES

$23.7m
Revenue from recycled products

898,497
Tonnes of recycled products sold

424,575
Tonnes of CO2-e abated emissions

58,223
Tonnes of METAL recovered

74,204
Tonnes of TIMBER recovered

1MW
SOLAR SYSTEM installed at Eastern Creek

Patons Lane Sydney GSW soil washing recycling facility

Patons Lane recycled water treatment plant and surrounding infrastructure will target the recovery of GSW soils producing in excess of 300ktpa of high quality recovered soils / sands, fill products and aggregates

up to 200,000t

Recycled aggregates

up to 20,000t

Recycled sand & soil

~100,000t

Engineered Filling Product

Targeting

95%

Diversion from landfill

Investment of

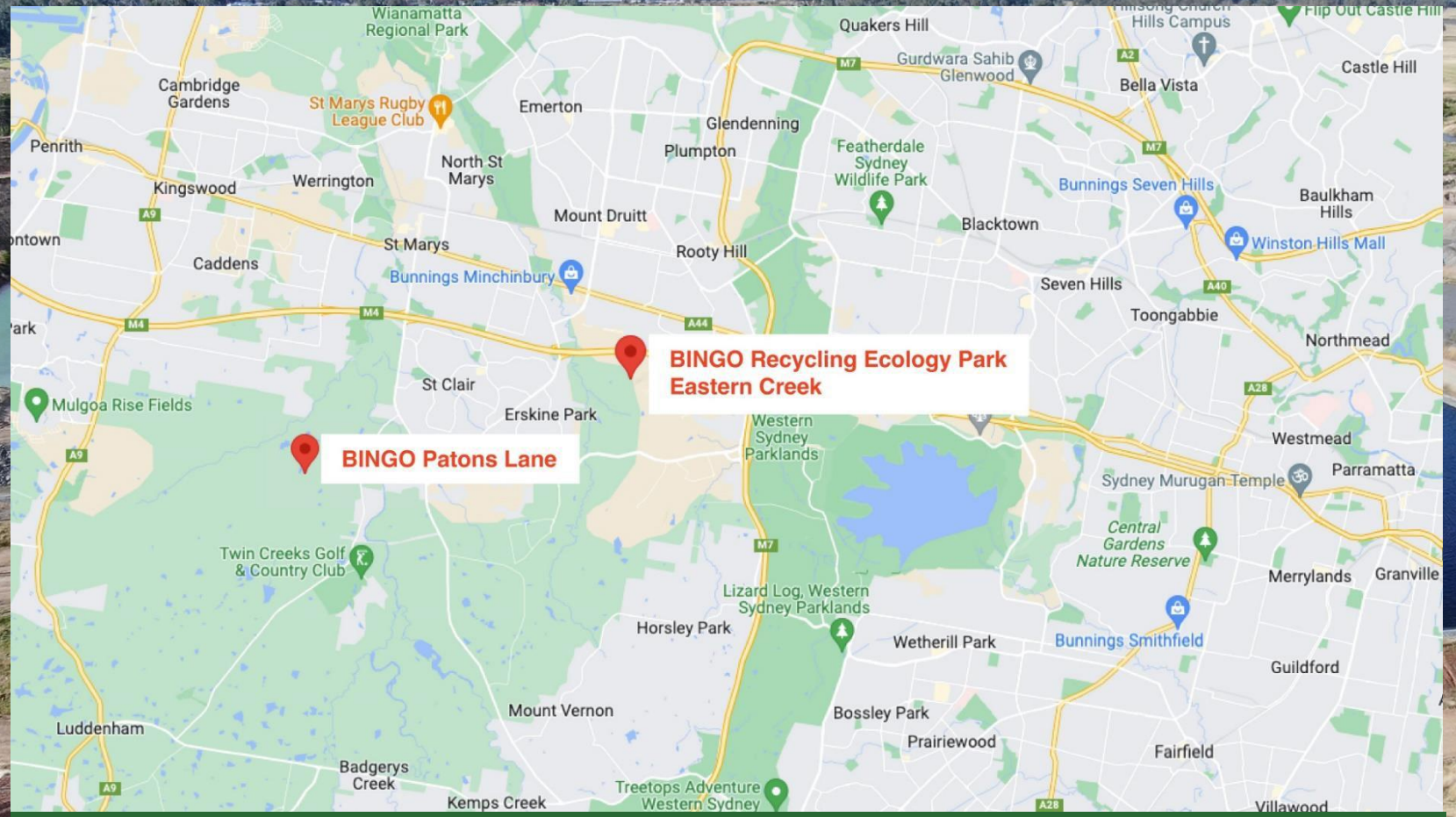
$14 million

- First large-scale C&D wet recycling infrastructure project in NSW targeting GSW soils
- Capable of producing ~300ktpa of recycled product for the Sydney market
- Located in Western Sydney growth corridor
- Reduce need for virgin quarried materials
- Quality assurance
- Project operational in April 2024

Benefits of using recycled products

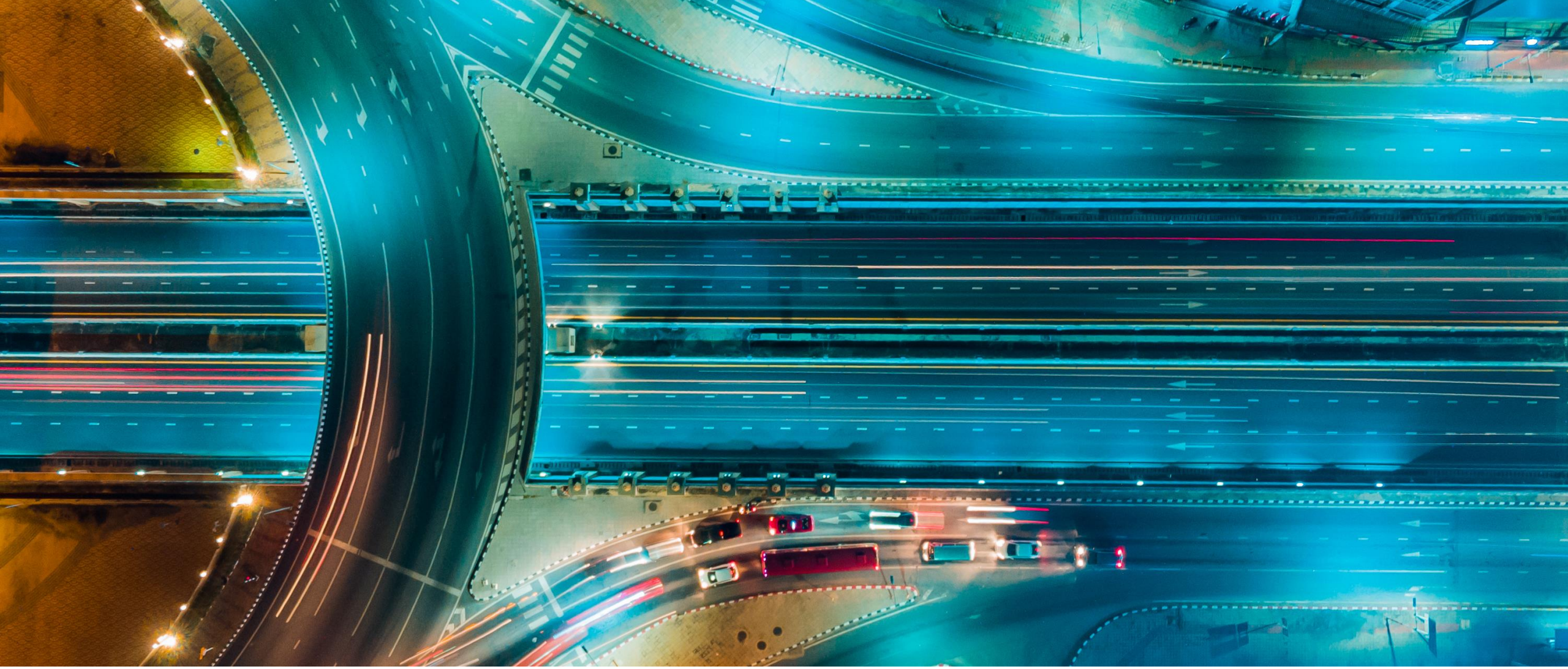
- ✓Reduced need for virgin materials
- ✓Diversion of waste from landfill
- ✓Reduced scope 3 emissions – transportation and recycled materials
- ✓Helps achieve recycled content targets
- ✓Ability to close the loop from site to site
- ✓Carbon benefit

BINGO INDUSTRIES



PATONS LANE RRC
OPENING END OF APRIL

BINGO INDUSTRIES



Ziger Energy

Yuchen Xu

Mission

Fast track the energy transition towards 100% renewables with innovative solutions;

Vision

Pioneering leader on energy storage and other solutions that are critical for next generation power systems;

Culture

Courage, Innovation, Diligence and Symbiosis;

Business

***Flywheel** solutions (UPS, Metro Wayside Energy Storage System, Dynamic Power System; Grid Stability System);*

***FLED** solutions (floodlight, tunnel light, street lamp, mining and explosion-proof lamp);*

***Long-duration** energy storage solutions;*

***Further innovation** in collaboration with Australian universities and research bodies.*

Q&A

Reynard Wood

George Reinke

WOOD WITHOUT WORRY

REYNARD WOOD

Building Materials made from Industrial Tailings/Waste for Environmental Benefit

VISION

Industrial Tailings/Waste alternative for outdoor; timber, concrete, and plastic building materials

MISSION

To accelerate Australian adoption of safe waste products

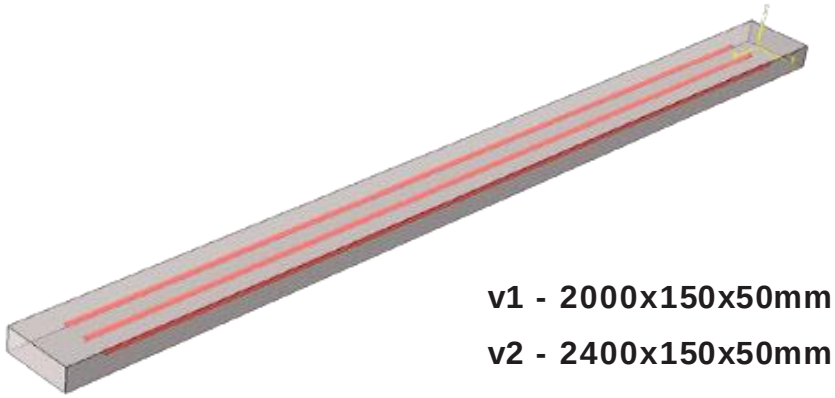
Presenter - George Reinke

HPFRCC

HIGH PERFORMANCE FIBRE REINFORCED CEMENTIOUS COMPOSITE

INGREDIENTS DETERMINED TO BE NON-HAZARDOUS	100%
• Industrial Tailings waste (cementous)	40-50%
• Binding Agent	5-10%
• Fibrous material (stabilizing agent)	40-50%
• Catalyst	0-1%
• Water	4-14%
• Modifier and Colourant	0-2%

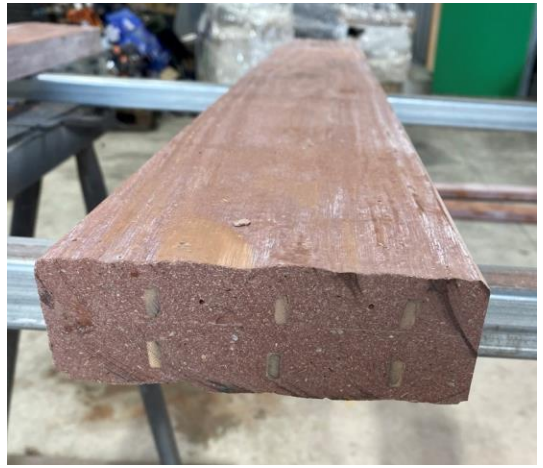
multi-purpose-plank



v1 - 2000x150x50mm

v2 - 2400x150x50mm

REYNARD WOOD
multi-purpose-plank



FLOORING RETAINING FENCING CLADDING

Australian Patent # 2021212149

IS RATING PROGRESS

REYNARD WOOD

LIFECYCLE ASSESSMENT - FACTORY DECLARATION

CARBON PRODUCT DECLARATION

- Help RETRO-FIT to replace timber products but not original built systems [50-75% savings]
- Use 40-50% mix with low-carbon GGBFS of Magnesium Oxide [40-50% savings]
- Limit carbon-intensive materials with 5-10% SCM Fly ash v OPC [>75% savings]
- Use 40-50% mix with Biogenic Carbon to stabilize and strengthen material [>A% savings]
- Use 0-1% mix with Catalyst to reduce the normal levels of water needed [>B% savings]
- Use 4-14% mix with water needed [>C% savings]
- Use 0-2% mix with Colorant to remove installation need to paint [>D% savings]
- Use 0-2% mix with Modifier to adjust and fine tune need to any future factors [>E% savings]
- Minimize installer waste by Modern Methods of Construction [>F% savings]
- Reuse installer waste by collecting and recycling with Cementous process [>G% savings]

ENVIRONMENTAL PRODUCT DECLARATION

- Aussie operation WFH, Outsourced warehouse/logistics, single shared van [Scope 1]
- Offshore, zero combustion fuels at factory, electric forklift & material mixer [Scope 1]
- Mixed product material HR poured into molds curing under environmental condition [Scope 1]
- Industrial Tailings & SCM transport via electric bulk train [4hrs] and bulk truck [4hrs] [Scope 2]
- Grass grown fibres [local plantations setup 5yr ago] transport via bulk truck [<2-4hrs] [Scope 2]
- Catalyst, colorant and modifier sourced locally in town where factory exists [Scope 2]
- Transport outgoing manufactured goods via bulk truck [4hrs] and bulk train [4hrs] [Scope 3]
- International transfer of goods via bulk shipping container ship method [Scope 3]
- Aussie pickup transport via truck [1hr], then re-distributed to store network [<1-3hrs] [Scope 3]
- Aussie Consumer store pickup transport via truck [<1-2hrs], completed to site [Scope 3]

AUSTRALIAN TESTING AUTHORITY ASSESSMENT - UNIVERSITY OF SOUTHERN QLD FUTURE MATERIALS

- Toxicology
- Environmental

University of Southern Queensland

DUE FOR COMPLETION BY 1ST MARCH 2024

HISTORY

REYNARD WOOD
multi-purpose-plank

2019

- First mixed batches with Cement Truck.
- Aussie market entered with v1 of 96 planks and tests.

2020

- 1st and 2nd containers with v1 of 2,592 planks.
- Sydney IHG stores stocked and tests

2021

- 3rd and 4th containers with v1 of 2,520 planks.
- Sydney re-stock and wider NSW IHG stores

2022

- Australian IP Patent contestable date period passed.
- Factory tooling produced for v2 plank from market feedback

2023

- Production of v2 with 4 key improvements.
- 5th, 6th, 7th, and 8th containers with v2 of 4,032 planks.
- Sydney and wider NSW and Gold Coast QLD stores provided v2 product to sell

9,240 planks




AUSTRALIAN TESTING

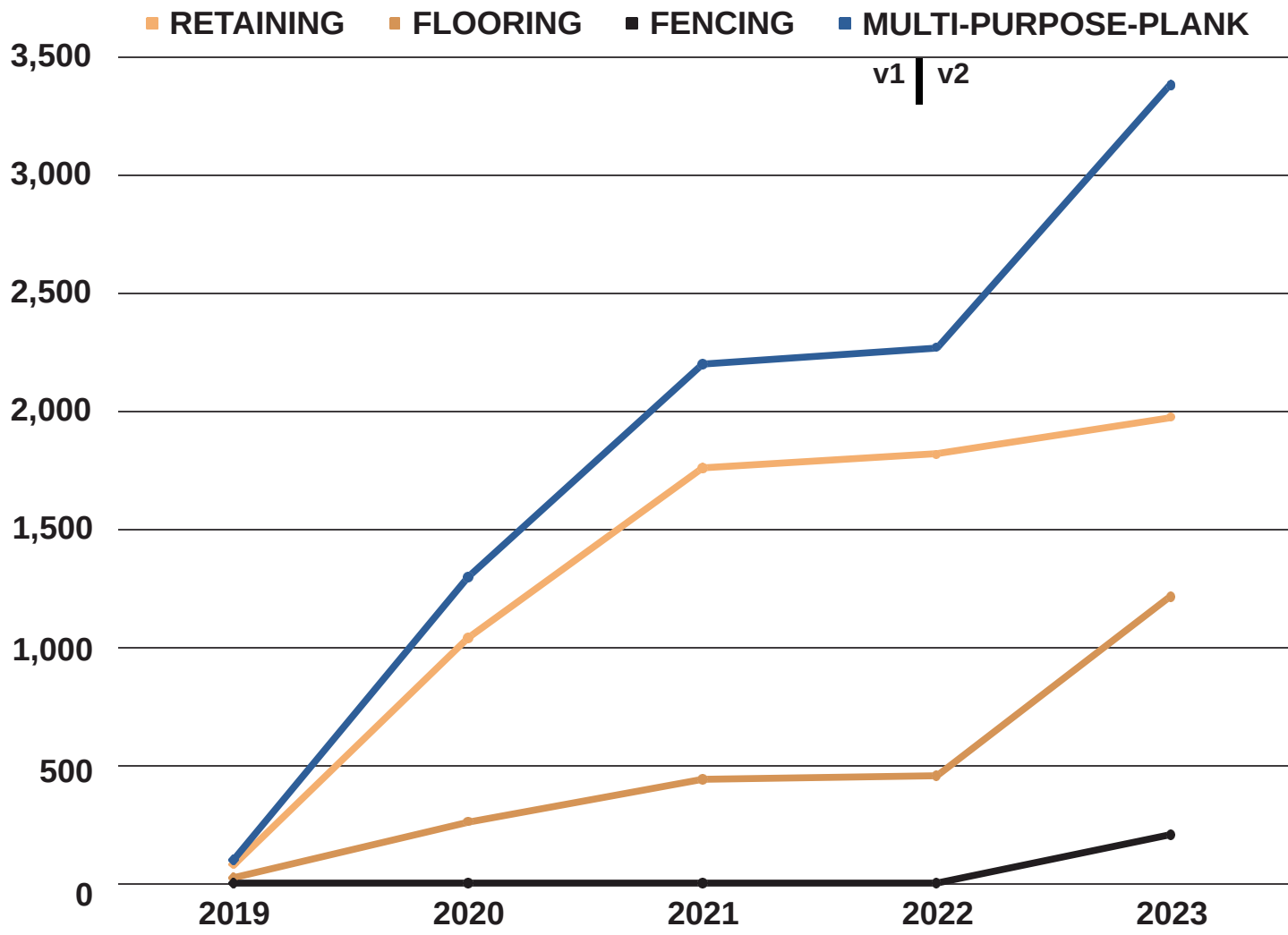
REYNARD WOOD

AS	SCHEDULE	TESTING AUTHORITY	DESCRIPTION	COMPLETED
AS 4586	2019	Safe Environments	Pedestrian Level Use	✓
AS 4586-D	2019	Safe Environments	Pedestrian Incline Use	✓
AS 1170.1	2020	Western Sydney University	Single-Point Structural	✓
AS 3600	2021	Western Sydney University	Multi-Point Structural	✓
AS 1530.3	2020	Ignis Labs	Non-Combust Material	✓
AS 3959	2023	Warrington Fire	BAL-FZ Approved	✓
AS 4964	2020	Airsafe	Asbestos Content	✓
ISO/IEC 17025	2021	Envirolab	Silca Content	✓
AS 3894.9	2021	Dulux	Adhesion	✓
AS 1580.408.5	2022	Dulux	Accelerated Wear	

FUTURE PLAN

REYNARD WOOD

- WFH/REMOTE OPERATIONS
  - JIT METHODS OF STOCK TO RETAIL STORES
- OPERATIONS
  - OUTSOURCED WAREHOUSE
  - OUTSOURCED LOGISITICS
- PROJECT MARKETING OF PRODUCTS
- PROPERTY DEVELOPER ALLIANCE(S)
- NEW PRODUCT CONTINUED DEVELOPMENTS



Cerclos

Morgan Ledger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Empowering Teams for Sustainable Infrastructure

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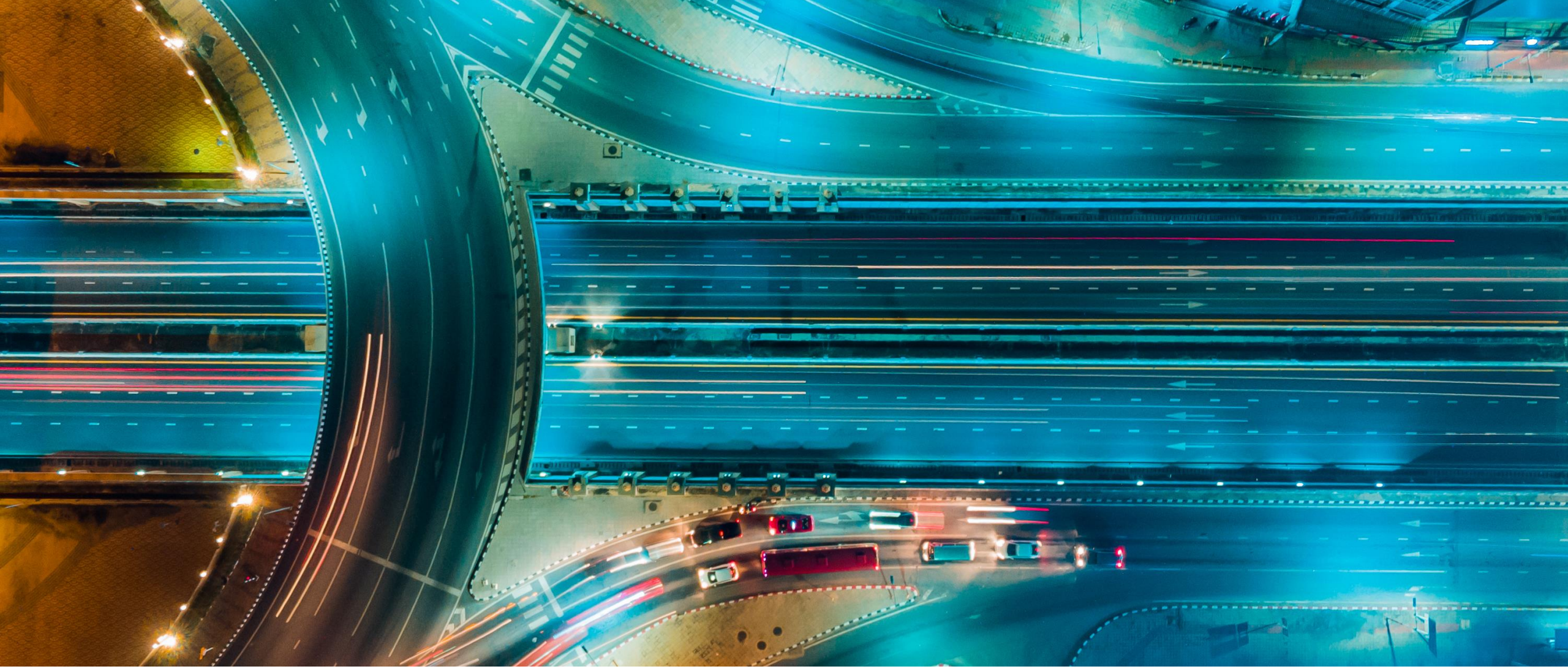

Geofabrics Australasia

Ryan Hackney

Ryan Hackney – Environmental Solutions
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ISC IMPACT AND INNOVATION – GEOSYNTHETIC SUSTAINABLE SOLUTIONS

GEOFABRICS®
Sustainable solutions

THE GEOFABRICS DIFFERENCE

For over 40 years, **Geofabrics is the market leading brand** in geosynthetic solutions in Australia, New Zealand and Pacific Islands.
We are focused on developing new and innovative products and providing our customers with world's best solutions to complete civil projects.

Australian Manufacturing

Local manufacturing means we can employ more Australians. This provides our customers with:

- Greater quality control
- More reliable supply chain
- Shorter lead times
- Flexibility & responsiveness

Sustainability & Innovation

We help our clients mitigate environmental risk through world leading research and innovative product development.

We work to protect, contain and secure the physical environment using smart geotextile and geosynthetic products.

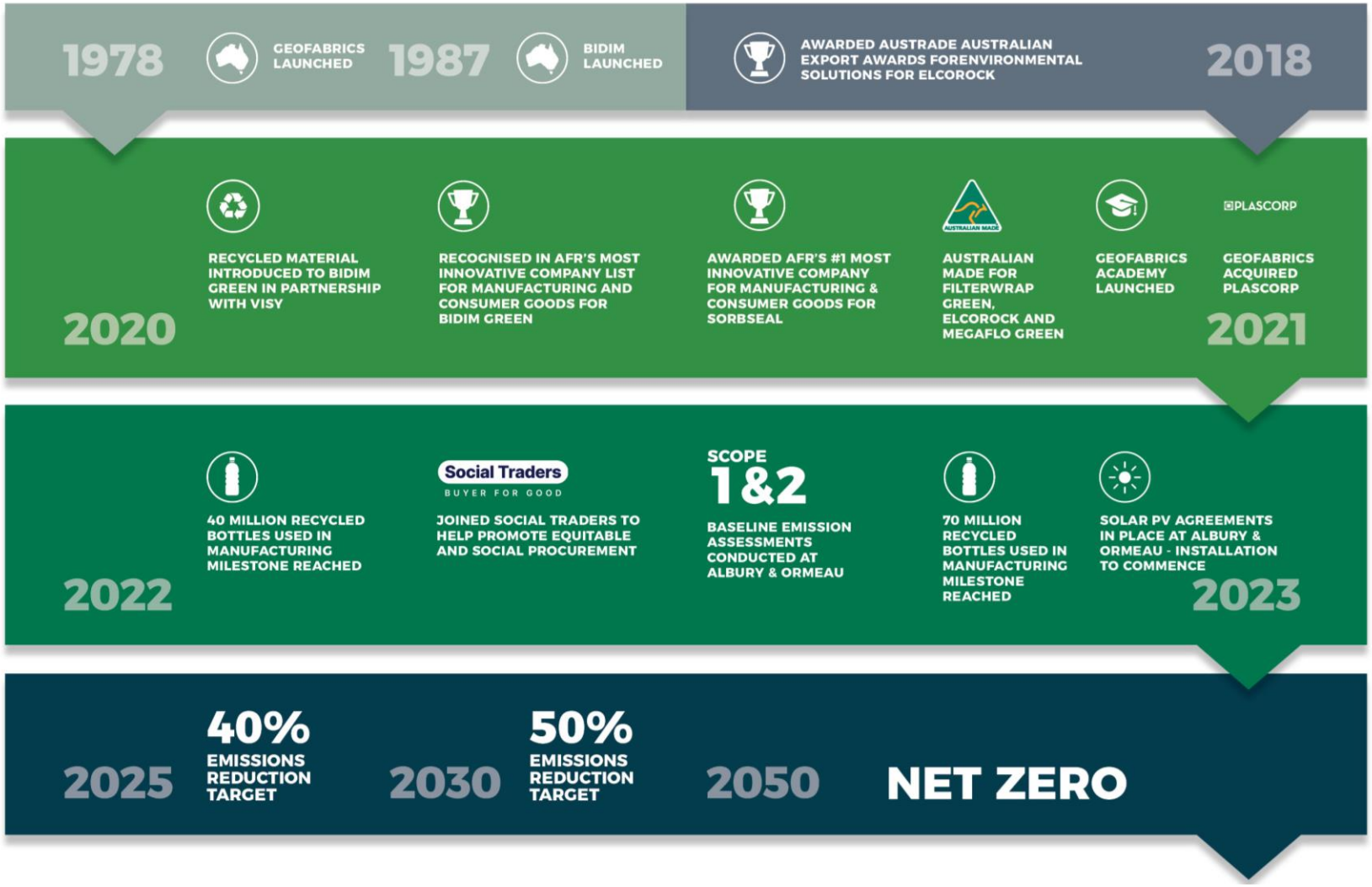
Technical Leadership

We supply world-class technical leadership and engineering through our:

- Innovation
- Industry education
- Design and independent testing services

GEOFABRICS®
Sustainable solutions

OUR INDUSTRY IMPACT AND INNOVATION



GEOFABRICS®
Sustainable solutions

THE EARTH IS CORE TO OUR BUSINESS

We work to protect, contain and secure the physical environment using smart geosynthetic products. We help our clients mitigate environmental risk through world leading research and innovative product development civil projects.

Recycled material

- Support circular economy by providing a use for recycled material in geosynthetic products (e.g. Bidim Green)
- Technology and software programs such as IFS, we are tracking the number of recycled bottles
- Proud member of the Infrastructure Sustainability Council (ISC)

Product packaging

- Ensure excessive packaging is avoided or reduced to optimise material efficiency
- Goal is to achieve 100% recycled packaging & 50% recyclable packaging for locally-made products
- Signatory of the Australian Packaging Covenant & report annually

Reducing energy intensive material use

- Reduce energy use & carbon emissions with lighter and less energy intensive materials in geosynthetics, compared to traditional construction materials
- Reduce the need to transport and use high quantities of quarried materials & aggregates to achieve the same result

Energy saving

- Implement changes to reduce our energy impact with solar systems and LED lighting
- Improve energy efficiency of production
- Reduce production waste

70 MILLION
plastic bottles recycled and material reused

GOAL OF 100% RECYCLED
packaging

APCO AUSTRALIAN PACKAGING COVENANT ORGANISATION

HOW GEOSYNTHETICS PROTECT, CONTAIN AND SECURE

According to the international geosynthetic institute (IGS) – every year humankind generates more than **10 billion tonnes of waste** from construction and demolition, much of which ends up in landfill.

Reduce energy consumption

- Reduced on-site excavation
- Less transport of bulky construction materials
- Faster and simpler construction
- Extension of infrastructure design life and reduced maintenance
- Contribution to the production and storage of green energy

Protect surface & groundwater

- Landfill lining and containment of hazardous waste
- Sludge dewatering & purification, & silt fence systems
- Construction of sludge & tailings lagoon capping reducing mine and quarry impact
- Grey water storage for use
- Preservation of potable & irrigation water supplies by lining canals, dams & reservoirs
- Prevention of run-off contamination

Environmental protection

- Facilitation of Sustainable Urban Drainage Systems (SUDS) surfaces
- Cost effective & resilient flood defense construction
- Provision of rapid emergency flooding prevention in disaster zones
- Coastal defense safeguarding property & natural habitats
- Rockslide prevention & protection
- Earthquake resistant infrastructure

Unequalled solutions

- Protection against contamination migration
- Permitting construction over otherwise unusable ground conditions
- Provision of 'artificial rocks' (sand-filled geosynthetics) for erosion & coastal protection

Economic growth & social welfare

- Faster and more cost-effective construction
- Connection of communities via more resilient infrastructure

GEOFABRICS®
Sustainable solutions

DECARBONISATION WITH GEOSYNTHETICS

Life Cycle Assessments, EPDs & Carbon Footprints

Application Area	No. Cases Described	Average Carbon Savings
Walls	6	69%
Embankments and Slopes	4	65%
Armoring	4	76%
Landfill Covers	3	75%
Landfill Liners	2	30%
Retention	3	61%
Drainage Pipe	3	40%
TOTALS	25	65%

Ref: GRI White Paper #41

Table 1(a) – Embodied Carbon Values for Different Traditional Construction Materials
(Univ. Bath, 2008)

Construction Material Type	Embodied Carbon (Kg CO_2/Kg)
Sand	0.005
Compacted General Soil	0.023
Concrete	0.77 to 1.39
Masonry Blocks	0.81
Timber	0.45 to 0.86
Steel	1.24 to 2.7
Water	0.2
Wood	1.7
Aluminum	9.3

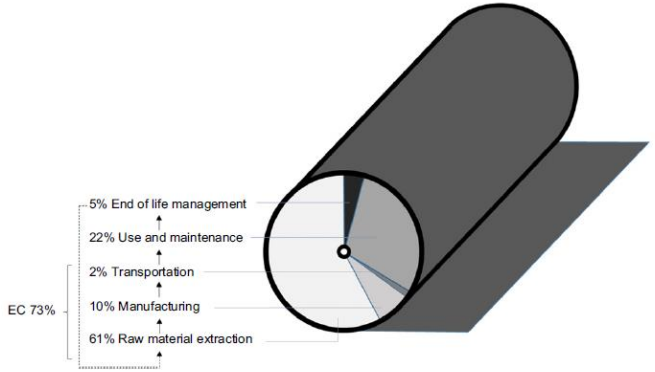


Figure 7. Example of contributions to the EC of a product

Table 6 – Embodied Energy and Carbon Values for Soil and Geosynthetic Layers of Landfill Cover Components;
(ref. U.S. EPA (2005), University of Bath (2008), and the Stucki, et al. (2011)

Layer Top-to-Bottom	Carbon Values (Kg CO_2/Kg material)
seeding and vegetation	0.190 Kg CO_2/Kg
topsoil	0.090 Kg CO_2/Kg
protection soil	0.023 Kg CO_2/Kg
drainage composite (PE)	1.7 Kg CO_2/Kg
geomembrane (PE)	1.7 to 2.0 Kg CO_2/Kg
geosynthetic clay liner	0.22 Kg CO_2/Kg
geotextile (PP)	2.7 Kg CO_2/Kg
soil foundation	0.023 Kg CO_2/Kg
proof rolling	0.045 Kg CO_2/Kg
diesel fuel	10.1 Kg CO_2/gallon

GEOFABRICS®
Sustainable solutions

AUSTRALIAN-MADE WITH RECYCLED MATERIAL

Our focus is to **protect, contain and secure** the physical environment by using sustainable geosynthetic product solutions.

We help mitigate environmental risk through:

- World-leading R&D and innovative product development
- Manufacturing products using Australian sourced PET & HDPE recycled plastic materials to support a circular economy

By incorporating recycled material into products such as Bidim® Green, Tracktex® Green, Sealmac® Green, Bitex® Green, Enduraseal® Green and Megaflo® Green, Geofabrics are reducing waste from Australian landfill.

With Australia creating over 74 million tonnes of waste each year & 130,000 tonnes of plastic ending up in our water ways & oceans, it's more important than ever to choose sustainable solutions.

IS Projects with Geofabrics include:

- Woolgoolga to Ballina – Pacific Highway upgrade
- New M5 – westConnex
- Paramatta Light Rail
- Toowoomba Second Range Crossing
- Caloundra Road to Sunshine Motorway
- Pacific Highway M1 – Mudgeeraba to Varsity lakes upgrade and Varsity Lakes to Burleigh
- Gold Coast Light Rail
- Ipswich Motorway upgrade
- Kaikoura Rebuild
- Auckland City Rail Link

ISupply

Bidim® Green, Megaflo® Green and Sealmac® Green are available on ISupply directory.

GEOFABRICS®
Sustainable solutions

GEOFABRICS®

Sustainable solutions

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Q&A

Thank You