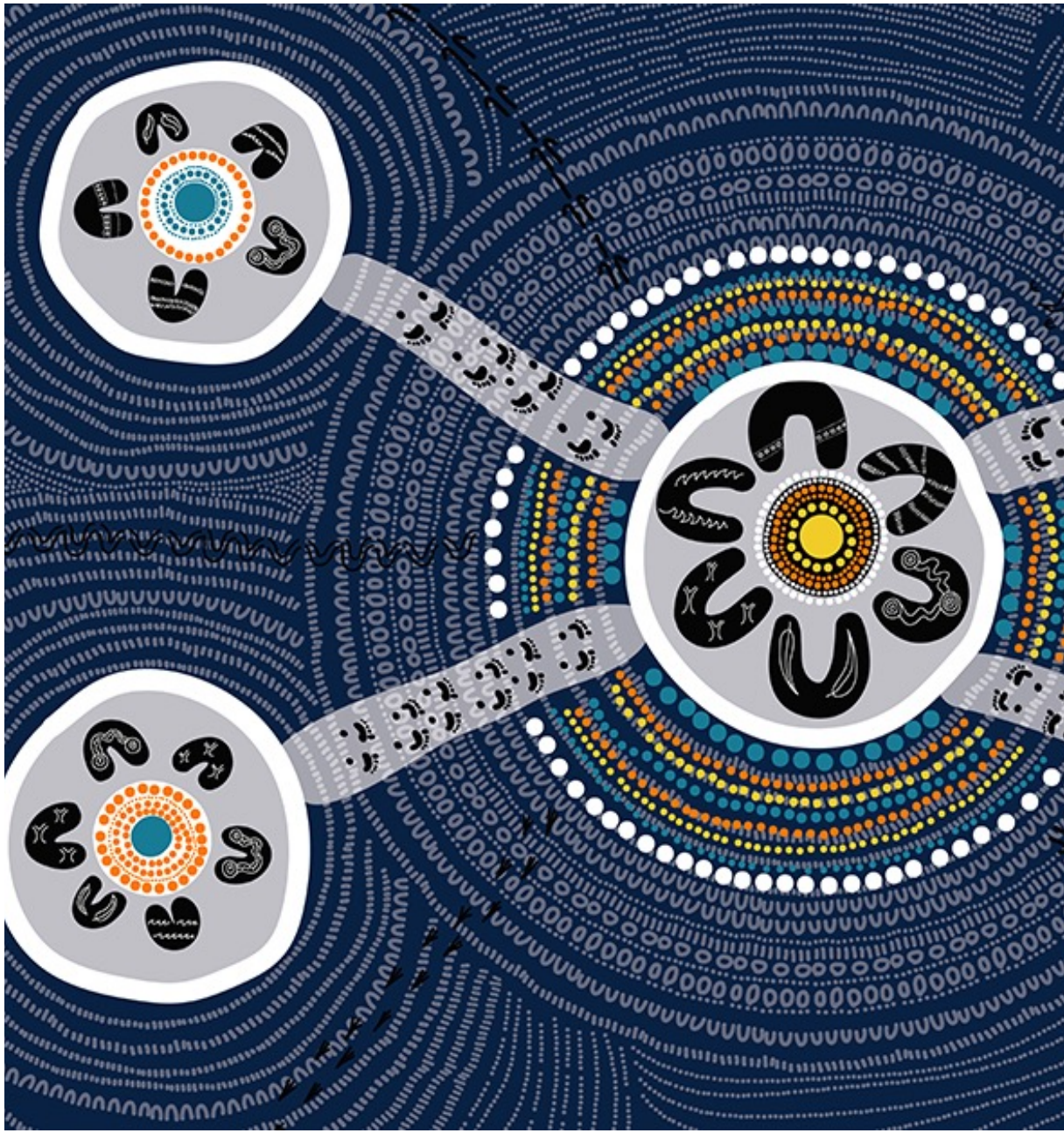
Infrastructure Sustainability Council

Suppliers in the Spotlight

30 May 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	Bill Currie
2	Amanda Bryan
3	Stuart Neilson
4	Jackson MacFarlane
5	David Welsh

Powerhouse Wind

Bill Currie, Chief Technical

PowerCrate®
by Powerhouse Wind

PowerCrate®

by Powerhouse Wind

Drop-in Hybrid Renewable Energy

Powerhouse Wind
Dunedin
powerhousewind.co.nz

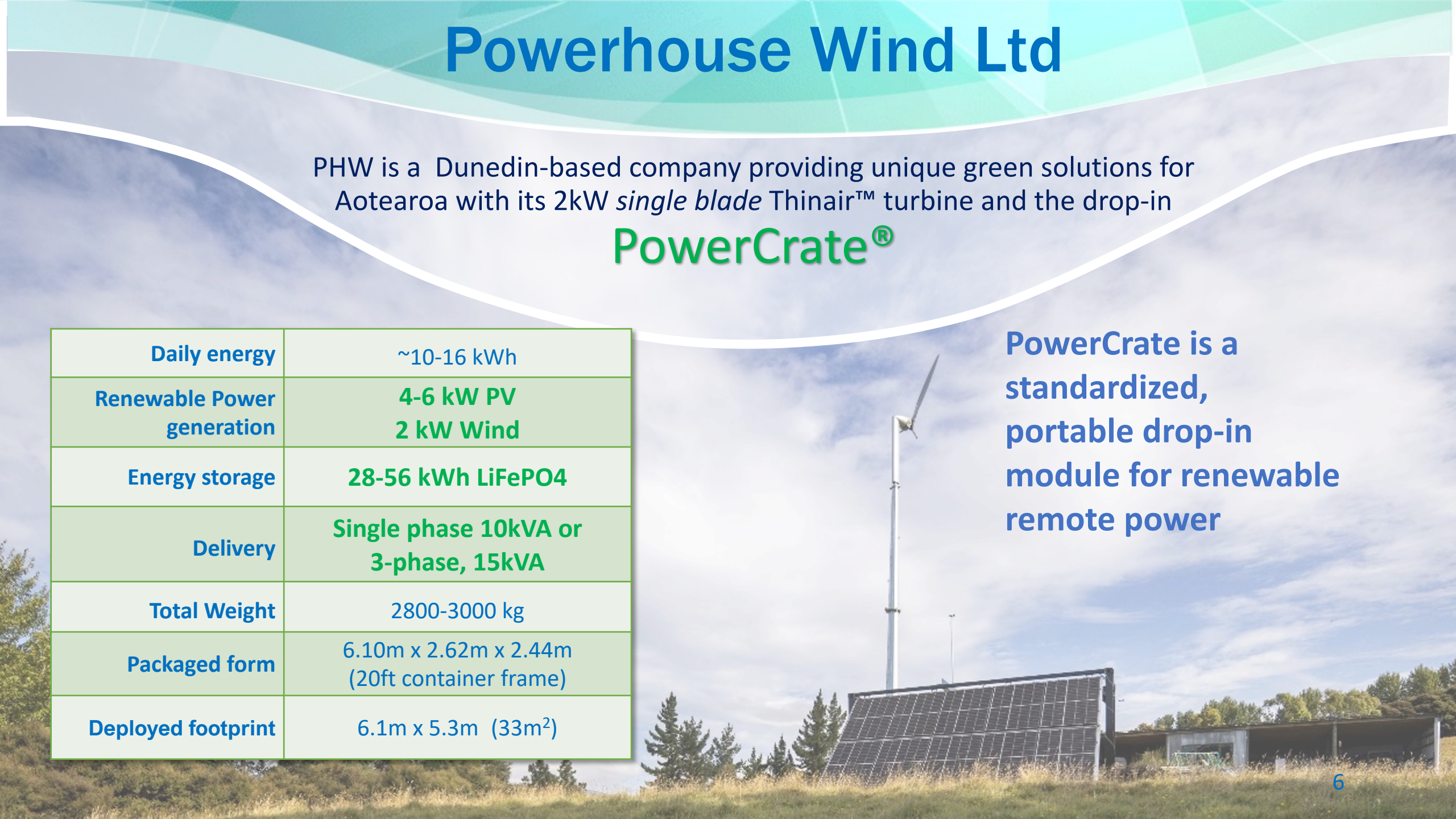
Powerhouse Wind Ltd

PHW is a Dunedin-based company providing unique green solutions for Aotearoa with its 2kW *single blade* Thinair™ turbine and the drop-in

PowerCrate®

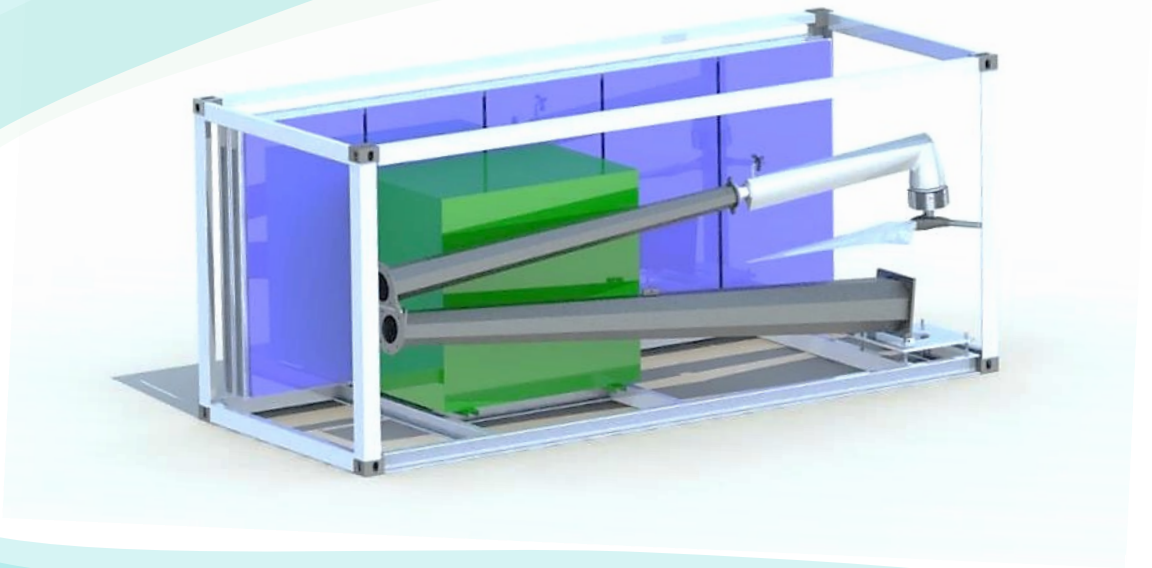
Daily energy	~10-16 kWh
Renewable Power generation	**4-6 kW PV** **2 kW Wind**
Energy storage	**28-56 kWh LiFePO4**
Delivery	**Single phase 10kVA or 3-phase, 15kVA**
Total Weight	2800-3000 kg
Packaged form	6.10m x 2.62m x 2.44m (20ft container frame)
Deployed footprint	6.1m x 5.3m ($33m^2$)

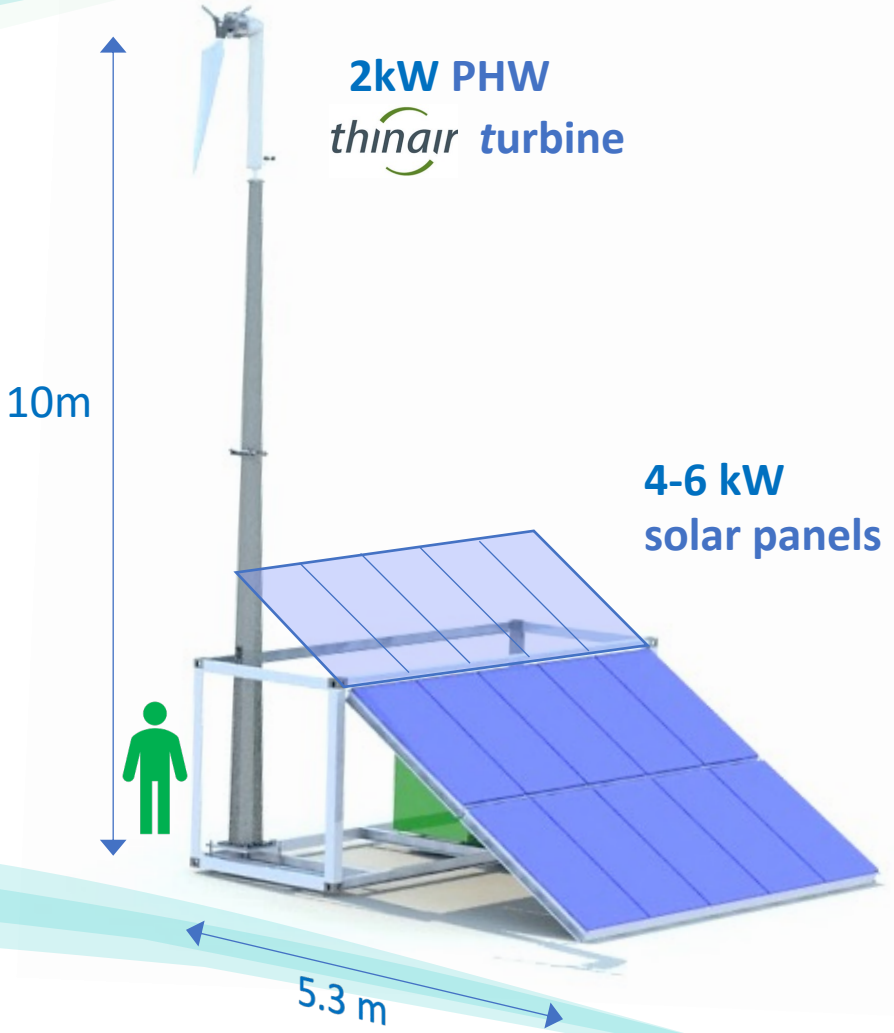
PowerCrate is a standardized, portable drop-in module for renewable remote power



PowerCrate®

powerhousewind.co.nz/powercrate/

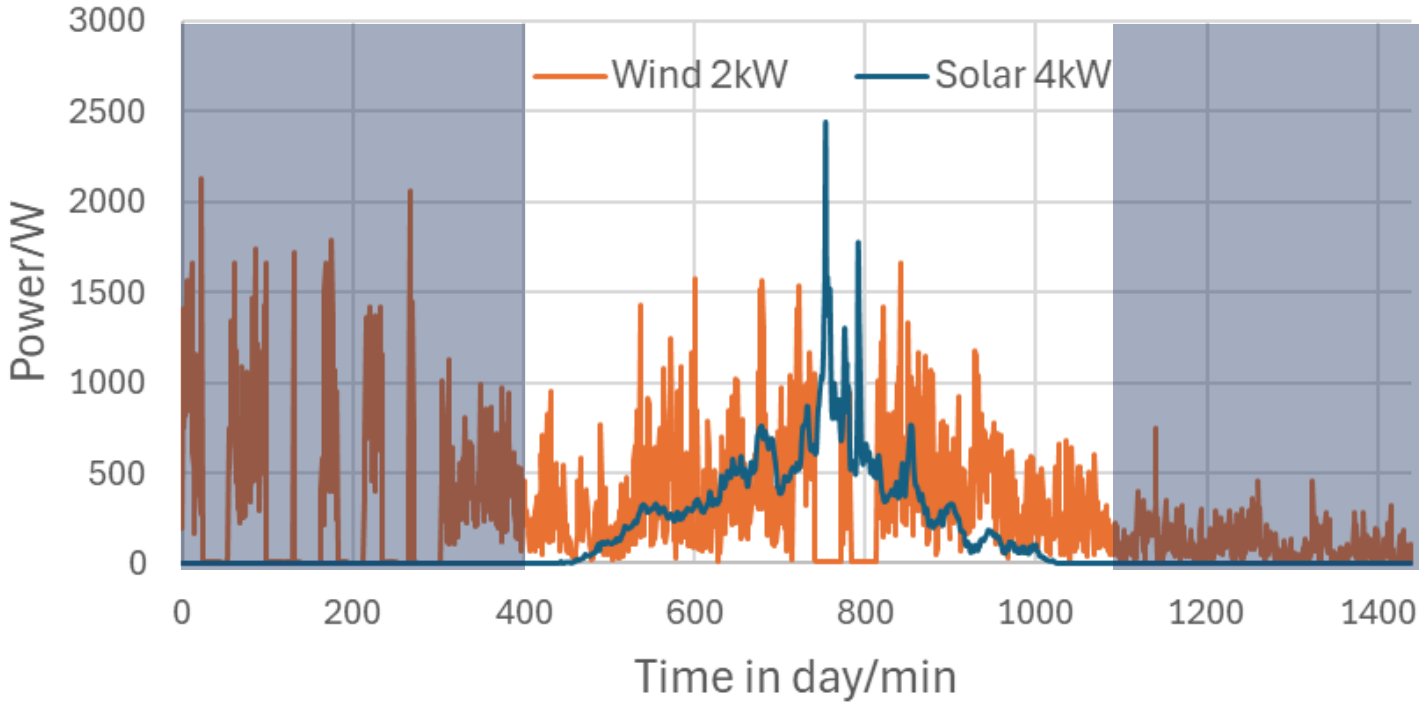




PowerCrate® is an architectural innovation
with all components individually field tested for years.

Hybrid Renewable Energy

- **Aotearoa – “*The long white cloud*”**
- **PowerCrate offers the highest potential for renewable based generation in its footprint.**
- **Wind complements solar for added energy resilience and reduced diesel consumption, especially in winter.**



A Standarised, Portable Module

11:30 am	1:30 pm	4:00 pm
Hiab pickup South Dunedin	Delivered to a Mt Cargill home	Fully deployed Mt Cargill, Dunedin

Diverse Applications

Off-Grid, autonomous diesel, Canterbury

On-Grid, 3-phase power boost, Marlborough

Edge-of-Grid, power protection, Otago

PowerCrate® Demonstration

Fieldays NZ

12 - 15 June 2024

Sustainability Hub,E38
Mystery Creek,
Hamilton, NZ

Come and tell us how to shape PowerCrate for your needs

Contact

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PowerCrate in trial with
Energy Marlborough Ltd
Blenheim, 2023

you will not be sharing your screen, our team will be transitioning the slides for you.

Mott MacDonald

Amanda Bryan, NZ Sustainability Lead

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Investing in infrastructure climate resilience

Physical Climate Risk Assessment Methodology (PCRAM)

30 May 2024

Presenter: Amanda Bryan
New Zealand Sustainability Lead

MOTT MACDONALD

Mott MacDonald are a global engineering and advisory consultancy with 18,000 employees, with local offices in Auckland Tāmaki Makaurau, Hamilton Kirikiriroa, Wellington Te Whanganui-a-Tara & Christchurch Ōtautahi

We work with clients and colleagues to create sustainable, climate resilient solutions with positive social and regenerative outcomes

Much of our infrastructure is not well adapted to climate change

Flooding in Wairoa

Landslides block roads in Titirangi & damaged homes

Napier wastewater treatment plant inoperable after inundation from floodwaters and silt during Cyclone Gabrielle

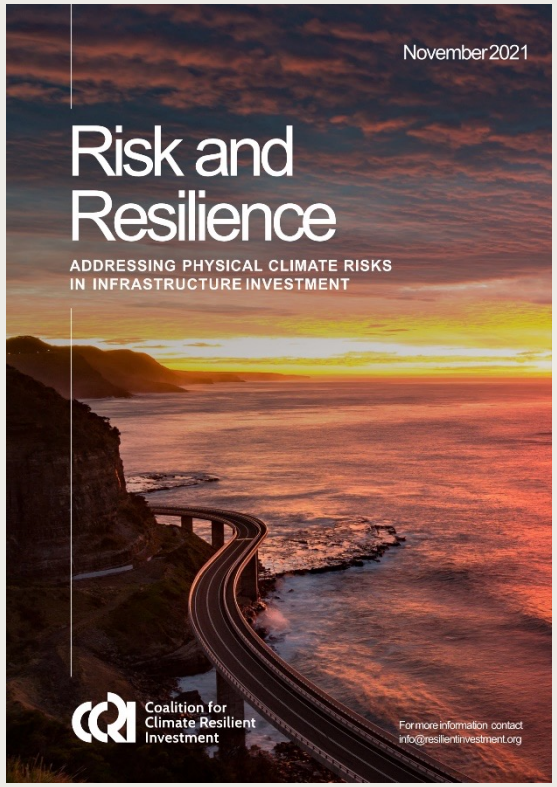
Hikuwai Bridge linking Tokomaru Bay with Gisborne

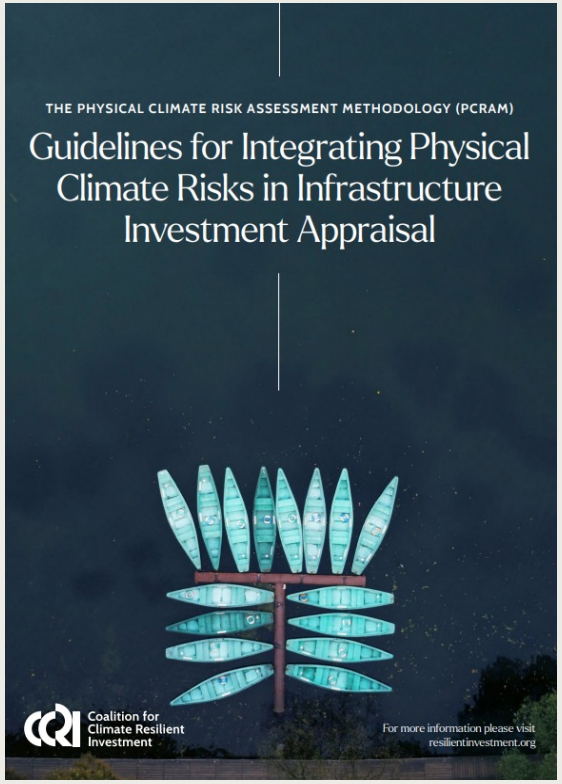
“Even if we were to stop emitting today, the infrastructure sector would need to implement climate resilience measures for decades to come”

Carlos Sanchez
Executive Director,
Coalition for Climate Resilience Investment (CCRI)

PCRAM
An approach to a more resilient infrastructure

A solution: Physical Climate Risk Assessment Methodology (PCRAM)



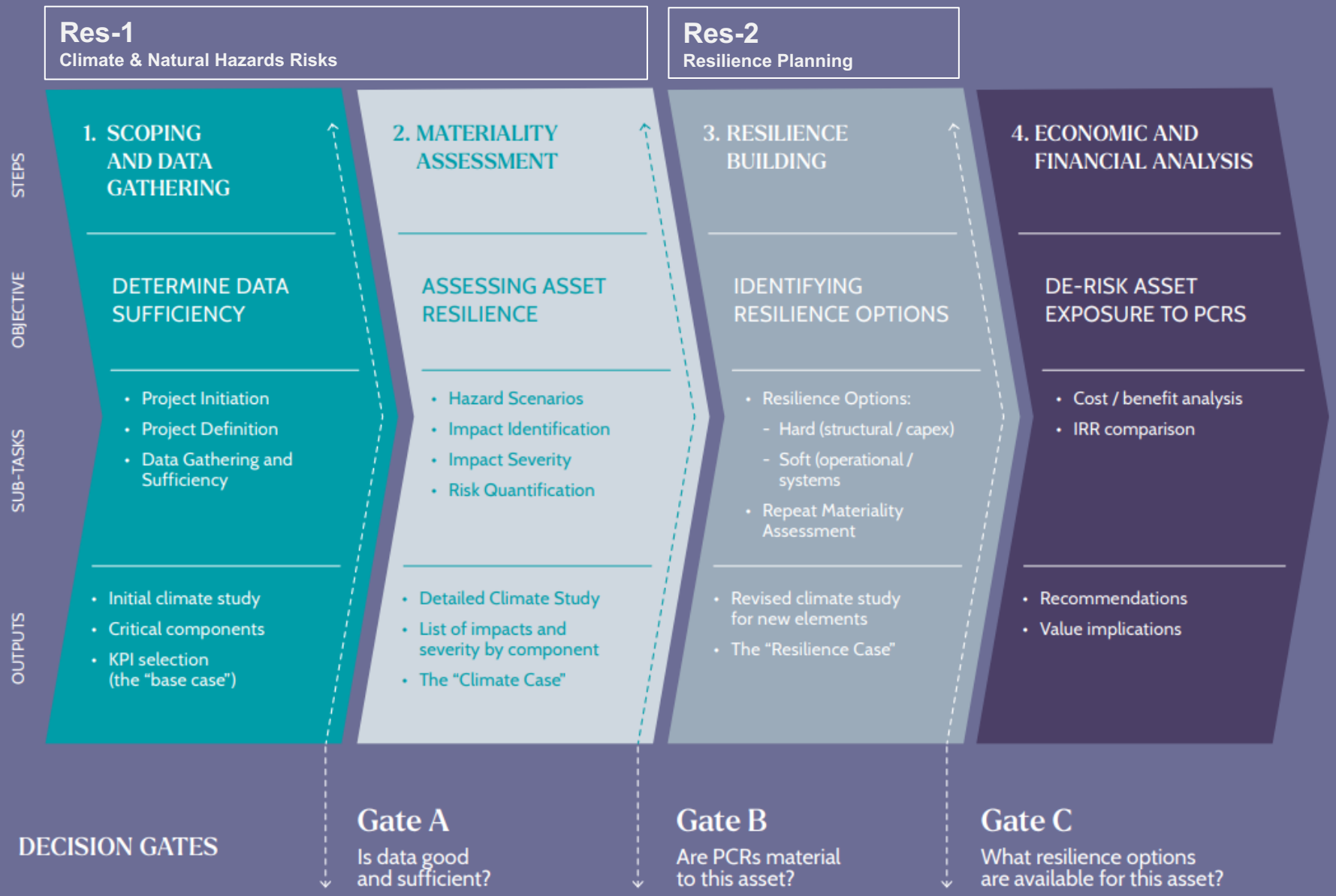


PCRAM is:

- A methodology for assessing Physical Climate Risks, quantifying impacts on asset performance and integrating them into infrastructure investment decision-making.
- A costed, quantified climate risk assessment
- A first-of-a-kind method that goes well beyond traditional approaches exclusively focused on (i) loss & damage (ii) acute hazards only and (iii) short-term time horizons.

PCRAM: The industry methodology for climate resilient infrastructure investment - Mott MacDonald

The Physical Climate Risks Assessment Methodology (PCRAM)



Te Ara Hauāuru, North West Rapid Transit, Auckland
Climate Change Risk Assessment & Resilience Plan

MOTT MACDONALD

Opportunity

- Project: NZTA Waka Kotahi rapid transit public transport detailed business case – North West Auckland.

- Mott MacDonald (JAMJ JV) were commissioned to prepare climate resilience assessments to investigate the physical and indirect risks posed by climate change to their current and future transport assets and networks.

Solution

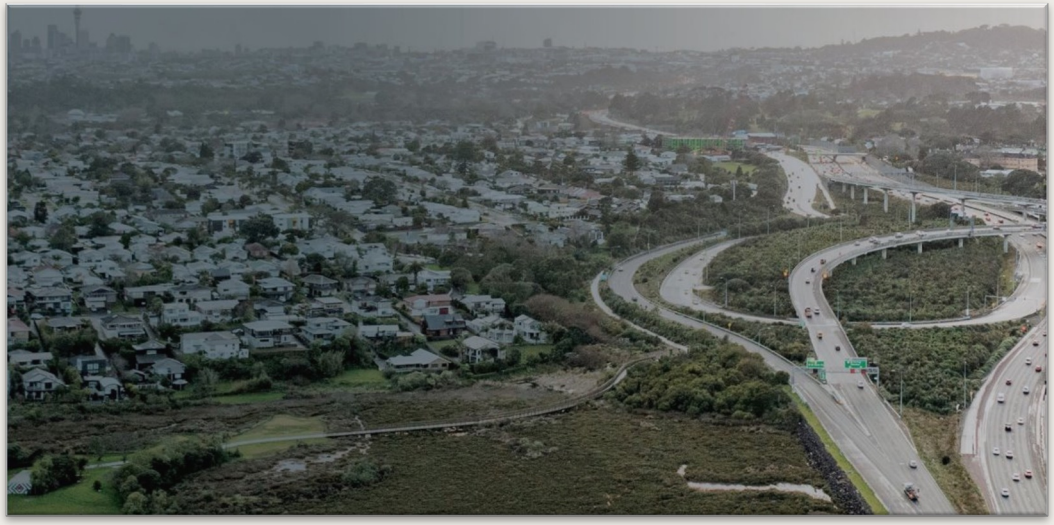
- Apply V2.1 IS Detailed Planning Rating Credits;
  Res-1 Climate & Natural Hazards Risks
  Res-2 Resilience Planning.

Outcome

- NZTA Waka Kotahi actively managing the risks that climate related hazards pose

- Integrate climate resilience early in a project

- Climate risk and resilience considered in decision making



MOTT MACDONALD

Thank you

Contact

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ENVIROMESH

Stuart Neilson, Head of Strategy and Sales

ENVIROMESH®

Made from 100% Recycled Plastic
Replaces Steel Mesh in Concrete

emesh®

ENVIROMESH®

Stuart Neilson
30th May 2024
ISC 'Impact and Innovation'

Introduction – The problem

The conventional way of strengthening pavements, footpaths, walkways, and concrete slabs involves using crack control mesh and steel bars.

However, this method is time-consuming, labour intensive, and poses many safety risks.

Additionally, it incurs extra expenses for transportation, installation, waiting times, site security, and traffic control.

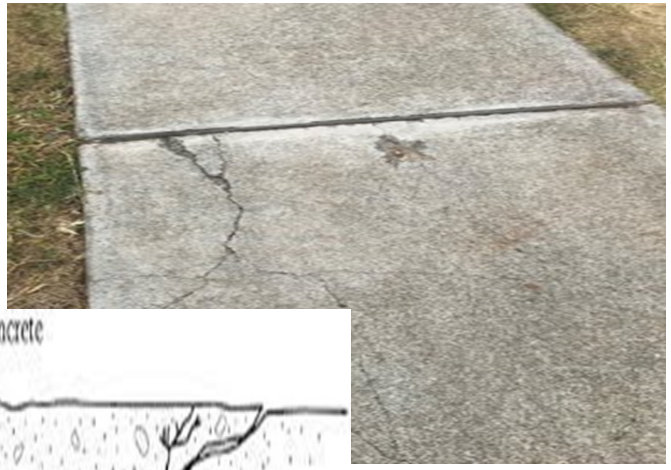
ENVIROMESH®

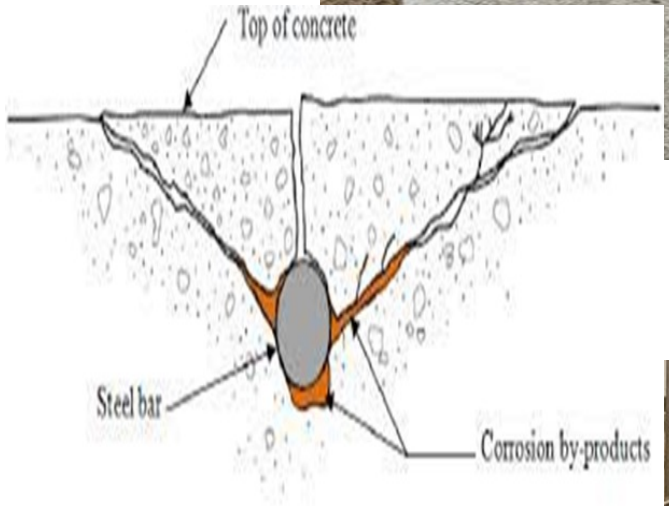
Introduction – The problem

We have been using the same method for years and achieving the same results.

However, it is worth emphasising that our current spend on steel mesh is contributing to additional pollution on the planet.

Persisting with this approach, despite its well-documented environmental repercussions, is a problematic choice.





ENVIROMESH®

At Enviromesh, we are rewriting the rules - replacing steel with synthetic fibres, making it safer, easier, faster, and more cost-effective for the client.

This recent project at Coburg railway station shows the footpaths around have all been constructed using our recycled fibres.

Working with LXRP this is one of the many projects to have used this streamlined solution.

This project alone saved 10 tons of emissions in the atmosphere. The footpaths were complete in 3 days with little disruption.

ENVIROMESH®

The Solution – eMesh

- Conceived and invented in 2015 in Australia and manufactured in Victoria.
- eMesh is made from 100% recycled polypropylene waste.
- Take out the steel and there will be 90% less CO2.
- Take out the steel and over 90% less water & fossil fuels will be consumed.

ENVIROMESH®

Used In Projects Across Australia

- Arrowheads Artificial Reef Modules, Near Stradbroke Islands
- Cowell Foreshore Aquatic Park, Cowell
- Daintree River Boat Ramp, Daintree
- Skeleton Creek Upgrade, Hobsons Bay
- Rail Maintenance Centre, Mortdale
- Shared User Path, Magnetic Island
- National Cycleway Project, Port Douglas
- Lighthouse Walking Track, Cape Byron Byron Bay

ENVIROMESH®

Next Generation in Concrete Reinforcement

- Macro Synthetic Fibre (MSF)
- Made from 100% Recycled Polypropylene
- Australian Innovation - PHD research at JCU
- Packaged by NDIS Supported Workers
- Made in Australia

Benefits

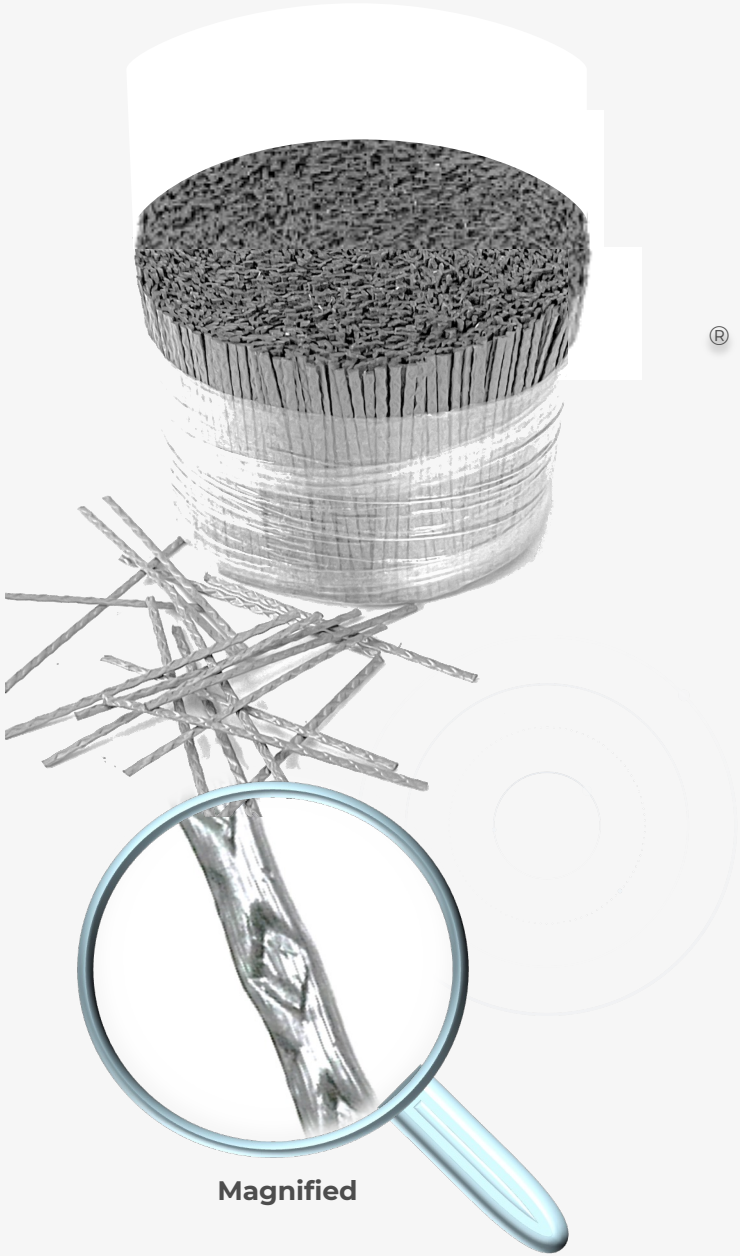
- Replaces steel mesh in concrete
- Ductility in post crack
- Greater durability for concrete in corrosive environments
- Positive new anchorage
- Huge environmental savings

eMesh Fibres

Length: 47 mm

Thickness: <0.5 mm

Anchorage:
Diamond Indents
Continuously Deformed



ENVIROMESH®

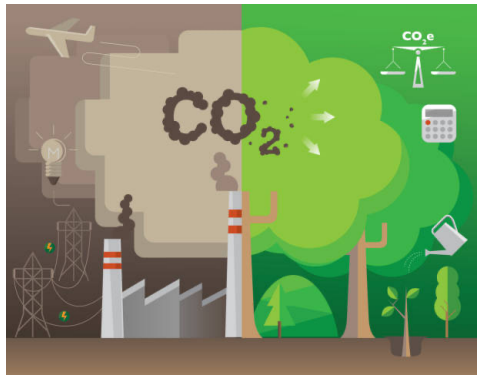
The Solution – Design and Delivery process

- Emesh fibre has been specified for the project.
- It is delivered to Plant in 3 kg bag on a 480 kg pallet.
- Fibre delivered to site in the concrete truck.

ENVIROMESH®

The Solution – Our Commitment

- We are committed to providing solutions that make a positive contribution to the development of sustainable communities and a low carbon-built environment.
- To date 800,000 kg of eMesh has been supplied and has saved the equivalent of 16,000 tonnes of CO2 emissions from the environment. That's equivalent to saving 160,000 tonnes of fossil fuels
- This is a such great example of how we can use recycled materials to build a more sustainable future.
- We're serious about managing and reducing the carbon footprint of our products and our business and helping our customers to do the same.



ENVIROMESH®

Replace Steel Mesh with eMesh

We are here to help you at every stage of your project.

1

CONSULTATION

Understand your specific needs and project requirements.

2

DEMONSTRATION

Showcase the effectiveness and versatility of eMesh.

3

CUSTOMISATION

Tailor the product specifications to fit your project needs.

4

TRAINING

Provide comprehensive training for your team on the handling and installation of eMesh.

5

SUPPORT

Offer continuous support and advice post-implementation.

ENVIROMESH®

Scan the code to see more of our projects.

emesh BY FIBERCON

ENVIROMESH®

Infrastructure Sustainability Council

Q&A

Hynds Pipe Systems

Jackson MacFarlane, Group Sustainability Manager

HYNDS PIPE SYSTEMS

HYGRADEWATER

WATERS & FARR

GILLIES metaltech

HYNDS PKS

HyndsLC – Lower Carbon Precast Concrete

- Developed to assist our customers to meet their sustainability requirements without compromising quality or durability.

Carbon reductions achieved through increased cement reduction (SCM use) and procuring lower carbon components. Average carbon reduction of 25% from our standard range.

Changes in raw materials and optimized design based on project limitations.

- Contributes towards Rso-6 and Inn-1.

HYNDSLC™

Our low carbon future

HyndsLC case study – College Hill, Auckland

Precast concrete solutions

- Our precast teams can manufacture unique, high-quality products to encompass sustainable outcomes.

- Precast concrete has a range of benefits over site-poured concrete:
  - Reduced on-site construction time
  - Reuse of formwork
  - Reduction of waste concrete
  - Increased use of SCMs
  - Higher quality control which leads to a higher quality, more durable product that will last longer

HYNDS

Contact information

- Jackson.MacFarlane@Hynds.co.nz
- Sustainability@Hynds.co.nz
- www.hynds.co.nz/sustainability/

HYNDS

Fletcher Building

David Welsh, GM Commercial

Firth

Golden Bay

Impact and Innovation at Scale to Build a Sustainable Future


Imagine if we could make concrete 30% lower in carbon by simply using waste that otherwise ends up in landfill.

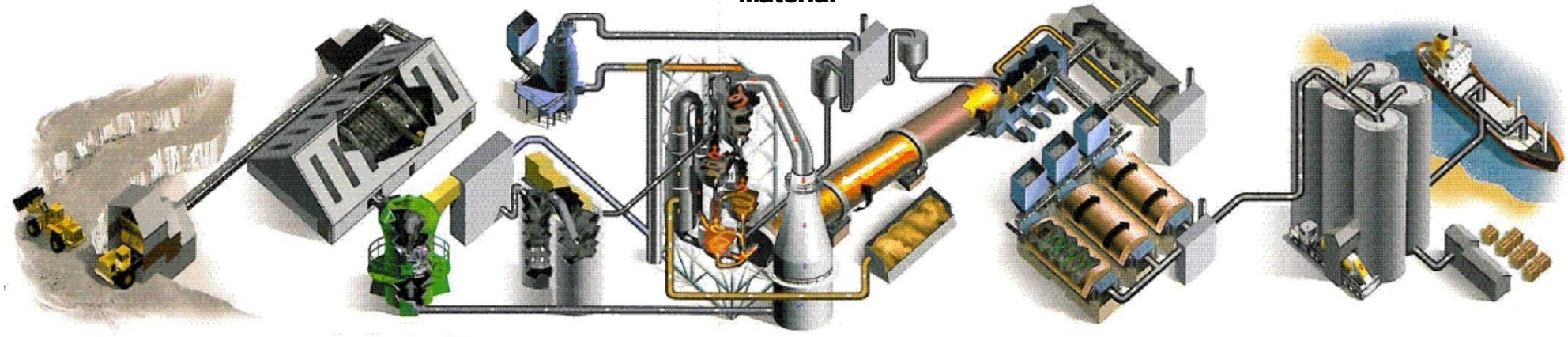
100,000T P.A. OF WASTE IS USED TO MAKE ECOSURE CEMENT

WASTE TYRES

WOOD WASTE

BOTTOM ASH

Fuel &
Material



Limestone → Clinker → Cement

GOLDEN BAY ECOSURE CEMENT IS NZ'S LOWEST CARBON GP CEMENT

860

699

Kgs of CO_2 per ton of cement

COMPETITOR EPD

19% less CO_2

FIRTH ECOMIX IS LOW CARBON CONCRETE USING ECOSURE CEMENT

LOW CARBON CONCRETE

CO_2KGs/m^3

ECOMIX

EC10
CO_2 reduction 10% to 20%

EC20
CO_2 reduction 20% to 30%

EC30
CO_2 reduction 30% to 40%

ECOMIX+

EC40
CO_2 reduction 40% to 50%

EC50
CO_2 reduction to 50%+

KNOW THE ACTUAL CARBON NUMBER

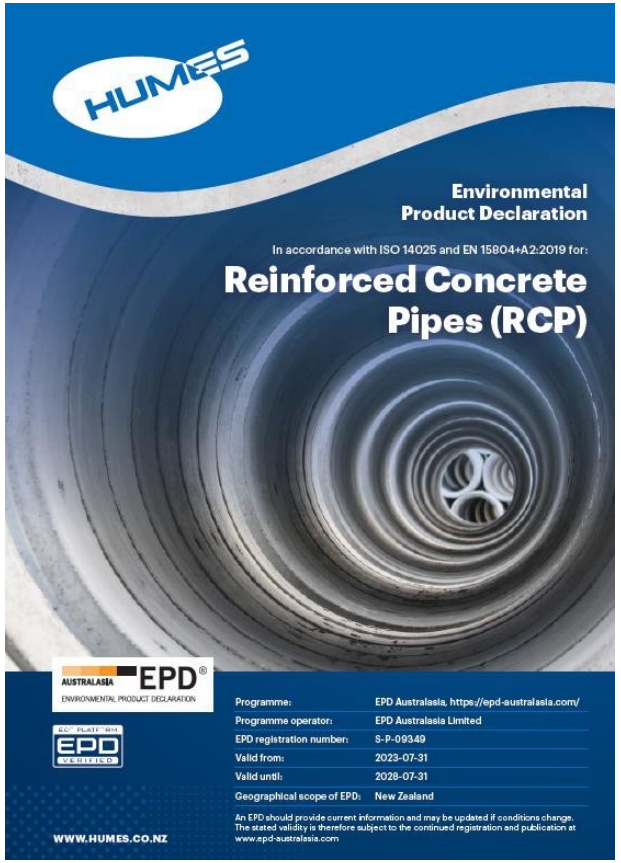
20 MPa	25 MPa	30 MPa	35 MPa	40 MPa	45 MPa	50 MPa
256	282	312	352	397	446	495
227	250	278	313	353	396	440
199	219	243	274	309	347	385
170	188	208	235	265	297	330
142	157	174	196	221	248	275

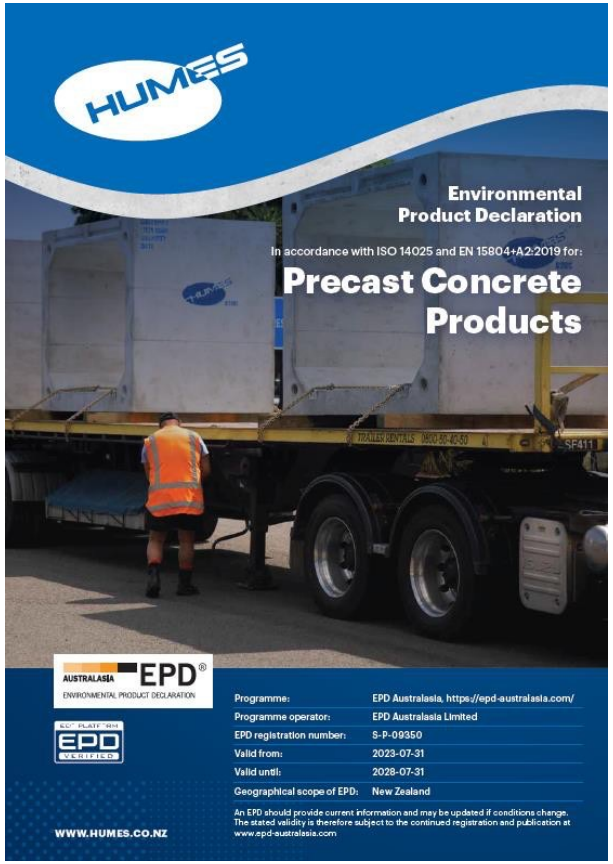
EcoMix®+ will typically require supplementary cementitious materials such as Fly Ash, Ground Granulated Blast Furnace Slag, or advanced admixtures.

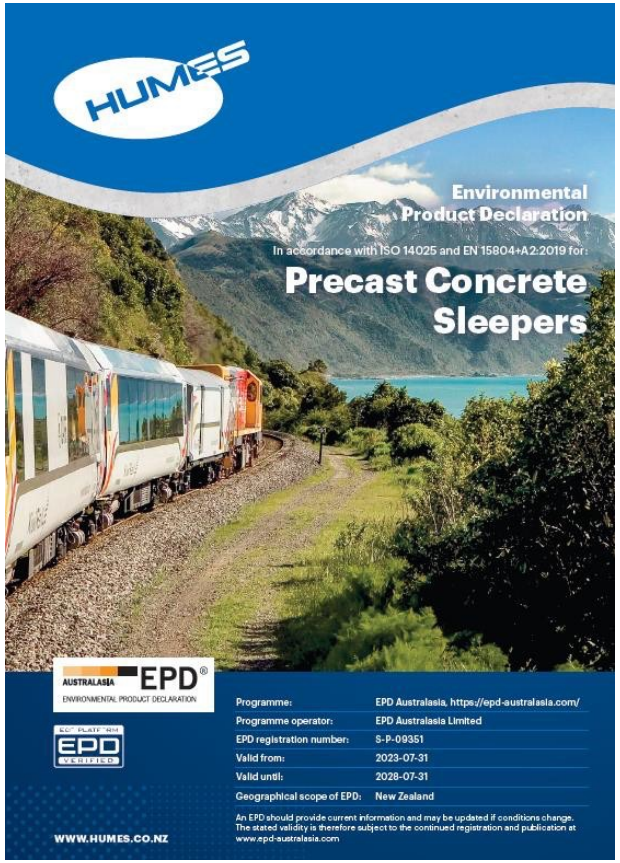
Reduction in embodied carbon compared to 2020 EC Baseline (ISC) for ready mix concrete provided by the infrastructure Sustainability Council from the Materials Calculator NZ 2.0.

Golden Bay · Firth · WINSTONE AGGREGATES · DRICON · HUMES

HUMES USE ECOSURE CEMENT TOO AND HAVE NZ'S FIRST CONCRETE PIPE EPD THAT STATES THE GWP







Golden Bay® Firth WINSTONE AGGREGATES DRICON® HUMES

LOW CARBON CIRCULAR SOLUTIONS DELIVERED WITH A LOW CARBON SUPPLY CHAIN

IMPACT AND INNOVATION AT SCALE THAT IS EASY TO USE

Golden Bay · Firth · WINSTONE AGGREGATES · DRICON · HUMES

Infrastructure Sustainability Council

Q&A

Thank You