

ecologia



enrich  
every project

# Low Carbon Concrete

ecologiQ  
Greener Infrastructure Conference

Matthew Wilton

18-20 September 2023



# ecologiQ Greener Infrastructure Conference

## ■ The Disruptor to our Industry

- Over 70% of the world's population lives in a structure that contains concrete

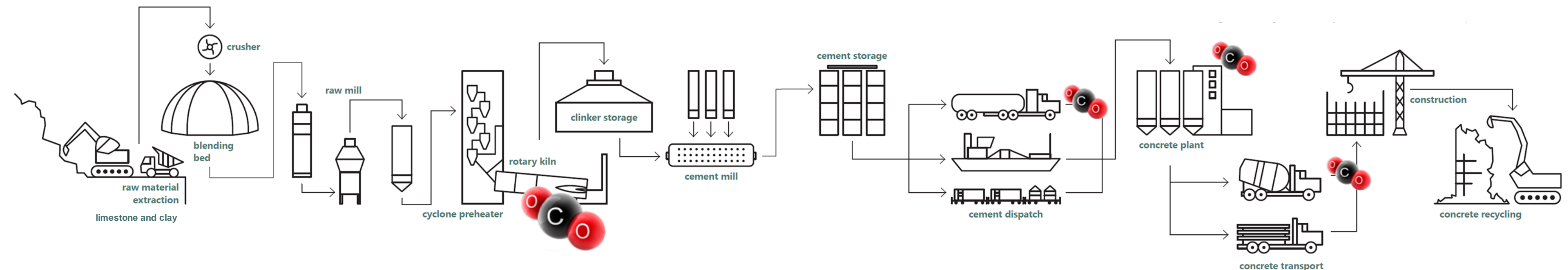
..... But the perception is that other materials are more sustainable

- Cement is one of the global economy's most carbon-polluting industries

..... And is the majority contributor in concrete

- Responsible for about 8% of global carbon dioxide (CO<sub>2</sub>) emissions in 2015

..... Equivalent if ranked as individual country it would be the third-largest greenhouse-gas emitter in the world behind only China and the United States





# ecologiQ Greener Infrastructure Conference

## Standard Concrete - Hanson

# enrich

### Ready Mix Concrete Product Family

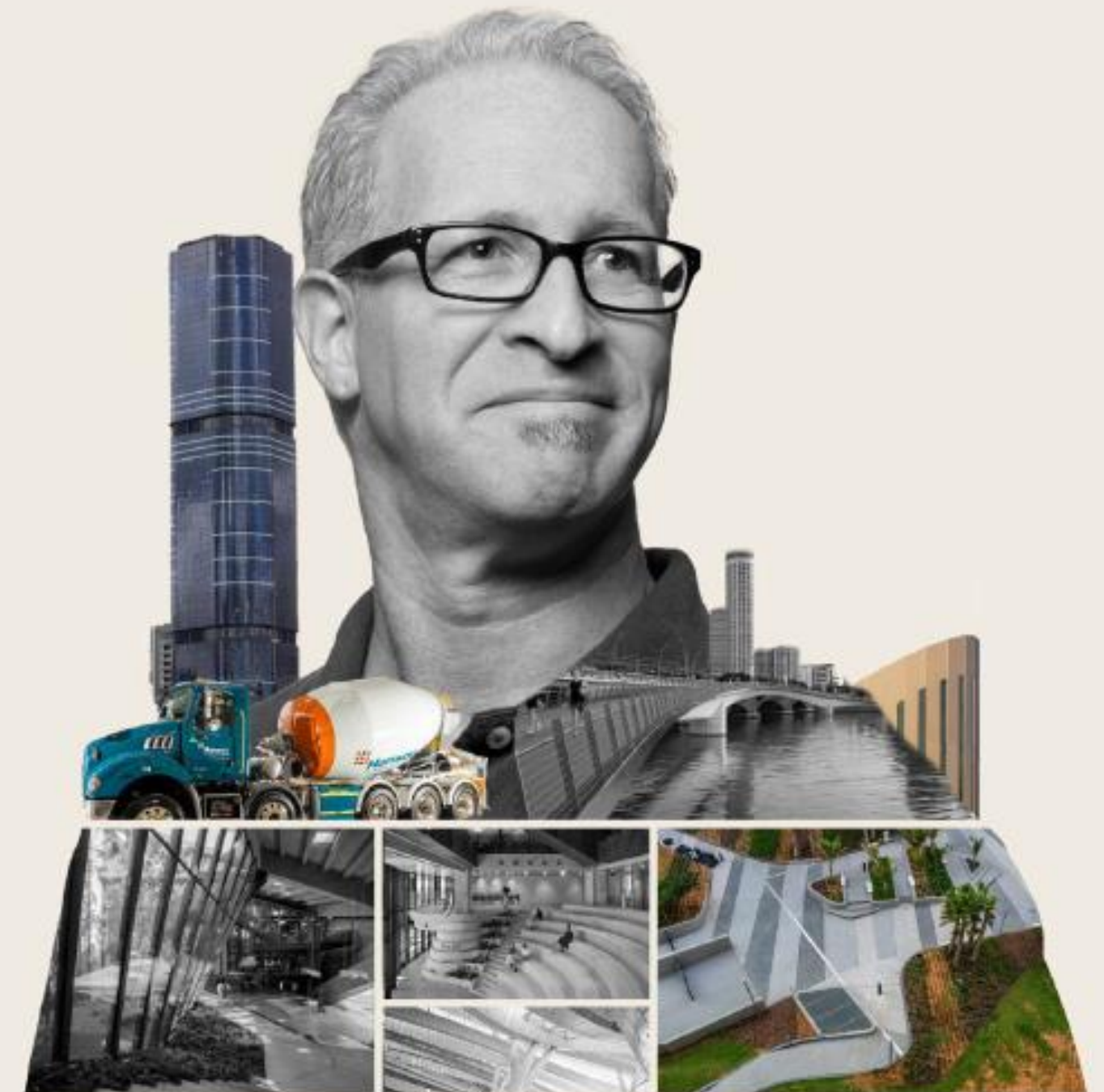
Within every Hanson concrete project is **a network of performance drivers** – market leading practices, processes, expertise, education and innovation. **Together this network enriches every project** – from the smallest build to the tallest skyscraper.

Much of our Standard Concrete has some carbon reduction when compared to straight GP mixes, but this varies from batch to batch, and plant to plant.

**However, we cannot class it as Low Carbon Concrete**

enrich  
every project

Detached Residential  
Multi Residential  
**Commercial**  
Industrial  
Infrastructure  
Social  
Additions & Alterations



Our ready-mix concrete combines expertise with global education to take your construction projects to new heights. Your vision, enriched by our experience.

 **Hanson**  
HEIDELBERGCEMENT Group

- Introducing the enrich 30 / 40 / 50 Range
  - “Standard Concrete” that has a **guaranteed carbon reduction of at least 30%, 40% or 50%**
  - And we can provide **reporting based on the actual deliveries of the project**
    - Pre-Project
    - During Project
    - Post Project

enrich-30  
enrich-40  
enrich-50





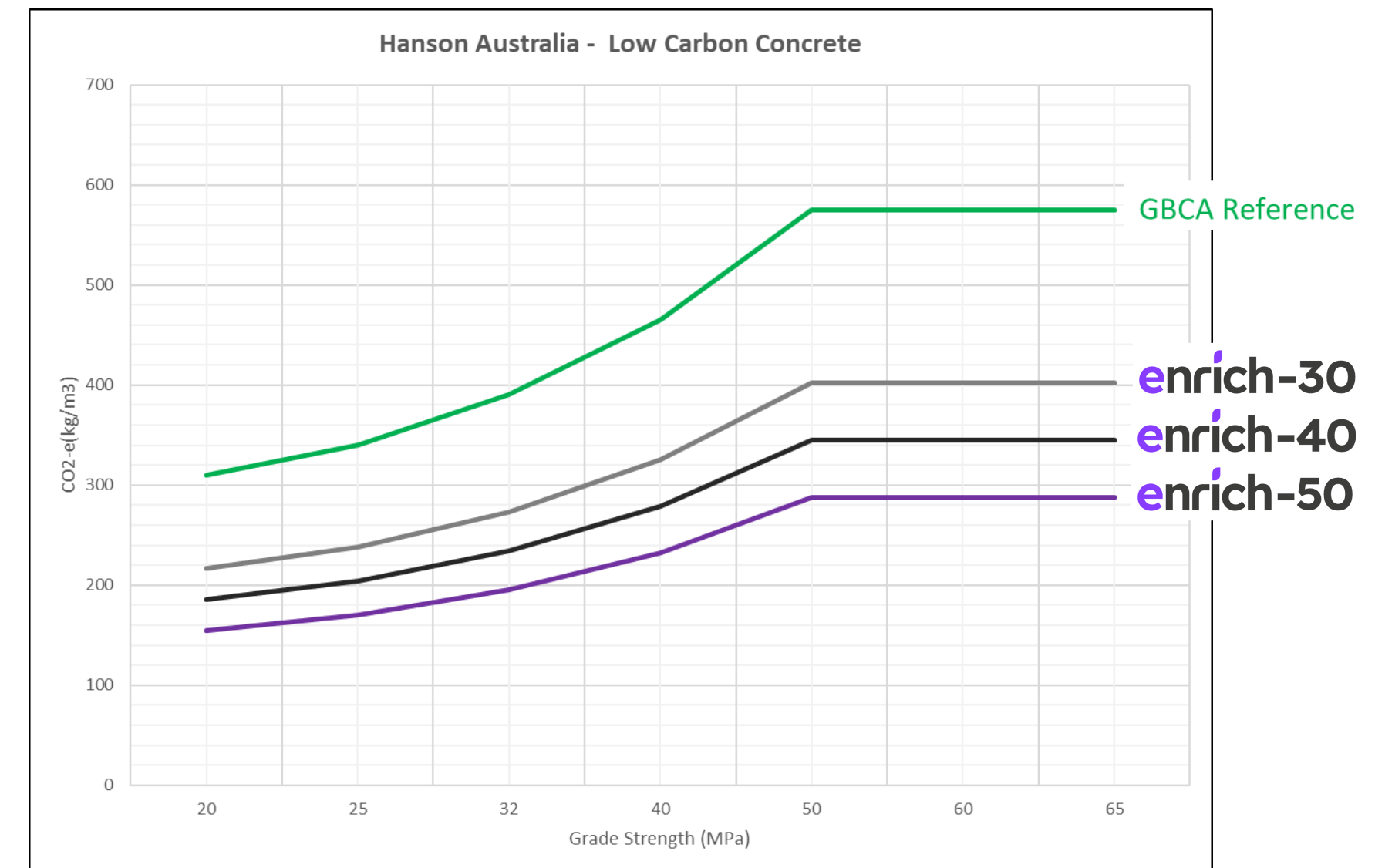
## 30% REDUCTION COMPARED TO WHAT?

Green Building Council of Australia

- Green Star - 19B.1 Design As Built Pathway (Concrete)
- Reference points for cement content by strength grade

| Grade (MPa) | Green Building Council Australia 19B.1 Reference Cement |   | Enrich-30                        | Enrich-40                        | Enrich-50                        |
|-------------|---|---|----------------------------------|----------------------------------|----------------------------------|
|             | Portland Cement Content (kg/m <sup>3</sup> )            | Reference CO <sub>2</sub> -e (kg/m <sup>3</sup> ) | 30% CO <sub>2</sub> -e Reduction | 40% CO <sub>2</sub> -e Reduction | 50% CO <sub>2</sub> -e Reduction |
| 20          | 280   | 310   | 217                              | 186                              | 155                              |
| 25          | 310   | 340   | 238                              | 204                              | 170                              |
| 32          | 360   | 390   | 273                              | 234                              | 195                              |
| 40          | 440   | 465   | 326                              | 279                              | 233                              |
| 50          | 550   | 575   | 403                              | 345                              | 288                              |
| 60          | 550   | 575   | 403                              | 345                              | 288                              |
| 65          | 550   | 575   | 403                              | 345                              | 288                              |

\*Reference CO<sub>2</sub>-e based on industry default emissions factors from GCCA tool including inbound travel



**NOTE:** For Grades above 65 MPa talk to your Hanson representative

## ■ The Challenge with Low Carbon Concrete

- Historically substituting materials in concrete mix design to lower the carbon content effects performance
  - Slower early strength development
  - Impact on schedule

## The Solution

- A concrete that has:
  - **High Performance**
  - **Low Carbon** – 30% to 50% reduction



### Low Carbon Concrete

Up to 50% CO2 reduction compared to standard concrete.



### Early Age Strength

Early age strength equivalent to standard post-tensioned concrete for faster construction.



### Lower Shrinkage

Lower shrinkage than standard concrete. Tested in accordance with AS1012.13.

# ECOTERA<sup>®</sup>

HIGH PERFORMANCE LOW CARBON CONCRETE





Case Study

Port of Brisbane x  
MEDLOG Project





## ■ ECOTERA – HIGH PERFORMANCE LOW CARBON CONCRETE

- A unique and innovative product:
  - **LOW CARBON CONCRETE** 30% to 50% reduction in CO2
  - **EARLY AGE STRENGTH** equivalent to standard post-tensioned concrete
  - **LOWER SHRINKAGE** than standard concrete – up to 50% improvement
  - **FLEXURAL STRENGTH** up to 50% improvement
  - **AESTHETICALLY PLEASING** due to a lighter colour
- Requires **no additional safety requirements** compared to standard concrete - pump, place and finish within standard WHS requirements.
- We can tailor the mix to meet your specific requirements

**ECOTERA**<sup>®</sup>  
HIGH PERFORMANCE LOW CARBON CONCRETE



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- We are passionate about working with our customers to leverage sustainable solutions in their projects.

Through our low-carbon concrete range, we help our customers achieve the sustainability goals they have set for their projects.

## Outcome and Objective Focused

- Working with our customers to achieve the best sustainability outcomes
- Use the right mixes for the right application
- The higher the tolerances, the more likely we will be able to reduce CO<sub>2</sub>
- Carbon reporting at all stages of the build

## Targeted Mix Design

- CO<sub>2</sub> reduction through mix design targeting specific characteristics
- Balance CO<sub>2</sub> reduction with workability, setting times, and some tolerance impacts
- Significant CO<sub>2</sub> reductions are available now with the right mix choices
- Alternative approaches can be deployed to address common site demands without significant increases in CO<sub>2</sub>

## Placement & Planning

- Understanding the characteristics of Low Carbon Concrete and working together to plan the best outcomes



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every project

Detached Residential  
Multi-Residential  
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Our ready-mix concrete combines expertise with global education to take your construction projects to new heights. Your vision, enriched by our experience.

**Hanson**  
HEIDELBERGCEMENT Group

The advertisement features a central image of a construction worker wearing a hard hat, looking upwards. Below this image is a collage of various construction and infrastructure projects, including a crane, a concrete mixer truck, wind turbines, a bridge, and a road construction site. The text 'enrich every project' is prominently displayed at the top left, and the Hanson HeidelbergCement Group logo is at the bottom right. A list of project types is on the top right, and a tagline is at the bottom left.



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**THANK YOU**