GREEN COUNCIL
環保促進會

Webinar:
Building and Construction – What are the missing hotspots?

The Way Forward for Low Carbon Construction Materials

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Future of low carbon construction materials

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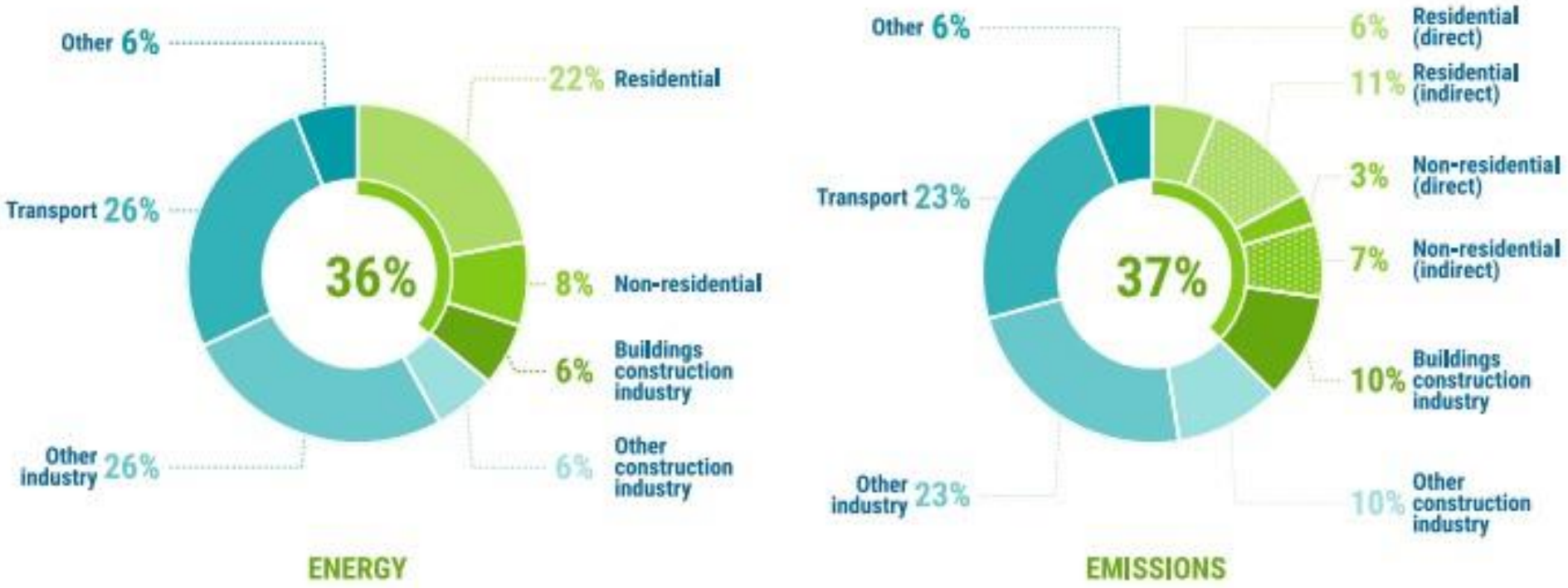
Energy use and Emission of the Building Construction Sector

Figure 2. Buildings and construction's share of global final energy and energy-related CO_2 emissions, 2020

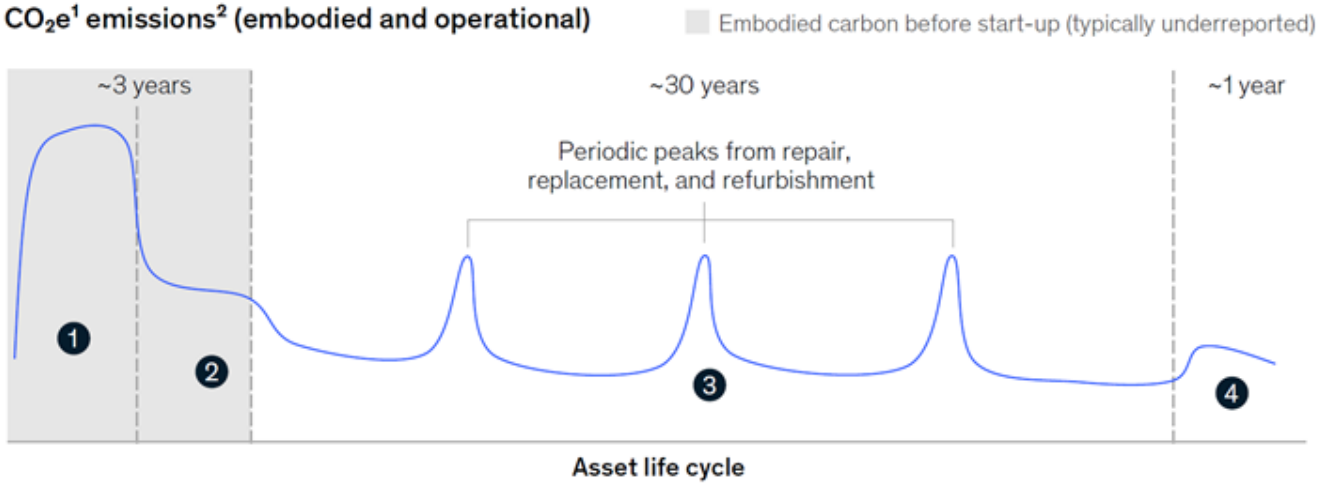


Note: "Buildings construction industry" is the portion (estimated) of overall industry devoted to manufacturing building construction materials such as steel, cement and glass. Indirect emissions are emissions from power generation for electricity and commercial heat.

Source: IEA 2021a. All rights reserved. Adapted from "Tracking Clean Energy Progress"

Sourcing and manufacturing optimization to lower embodied CO2, Versatile Materials support Long-Term Renovation Strategy

Embodied carbon is irreversible once an asset is built and accounts for up to 50 percent of the asset's lifetime emissions.



1. **Construction material procurement**
   Driven by carbon-intensive manufacturing processes for bulk construction materials such as steel, concrete, aluminum, copper, and plastic
2. **On-site construction**
   Driven by fuel consumed by heavy construction vehicles and other Scope 3 emissions (eg, workforce commuting)
3. **Operations**
   Driven by heating and water utilities and electricity consumption, along with other Scope 3 emissions (eg, workforce commuting, purchased goods and services, and transportation and logistics)
4. **End of life**
   Driven by demolition, waste processing; can gain credits for reuse and recycling

Chart Source: Reducing embodied carbon in new construction 2022, McKinsey & Company

Share the responsibilities and benefits of the Low Carbon economy

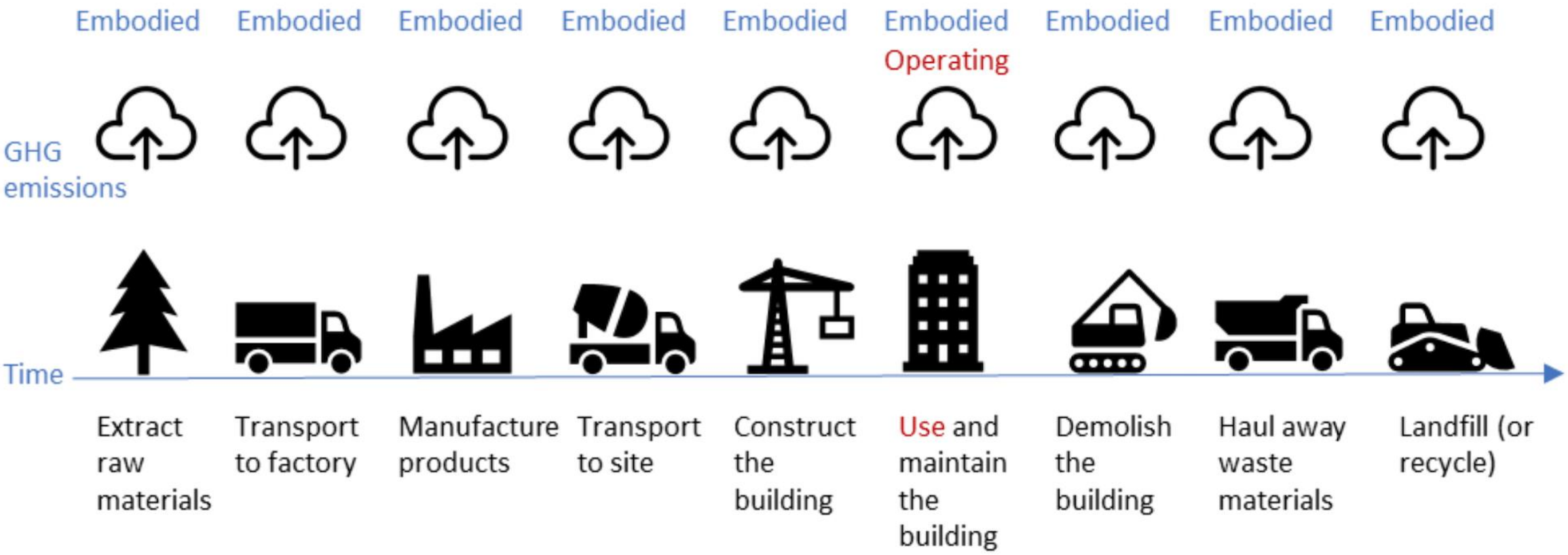


Chart Source: C40 Cities Climate Leadership Group, Inc.

Enhance transparency and accountability

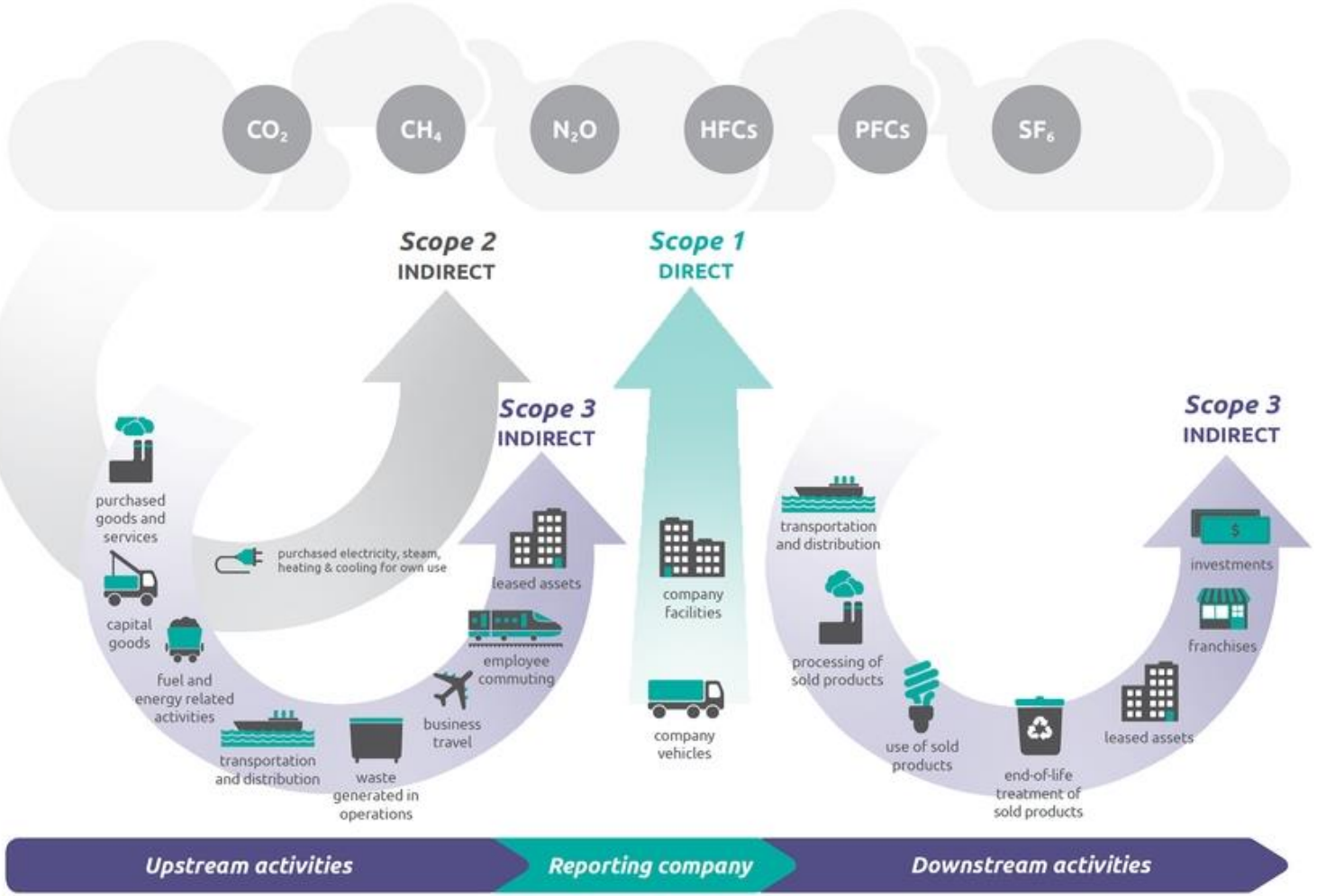


Chart Source: Hong Kong Trade Development Council

Carbon reduction blueprint (Alliance example)

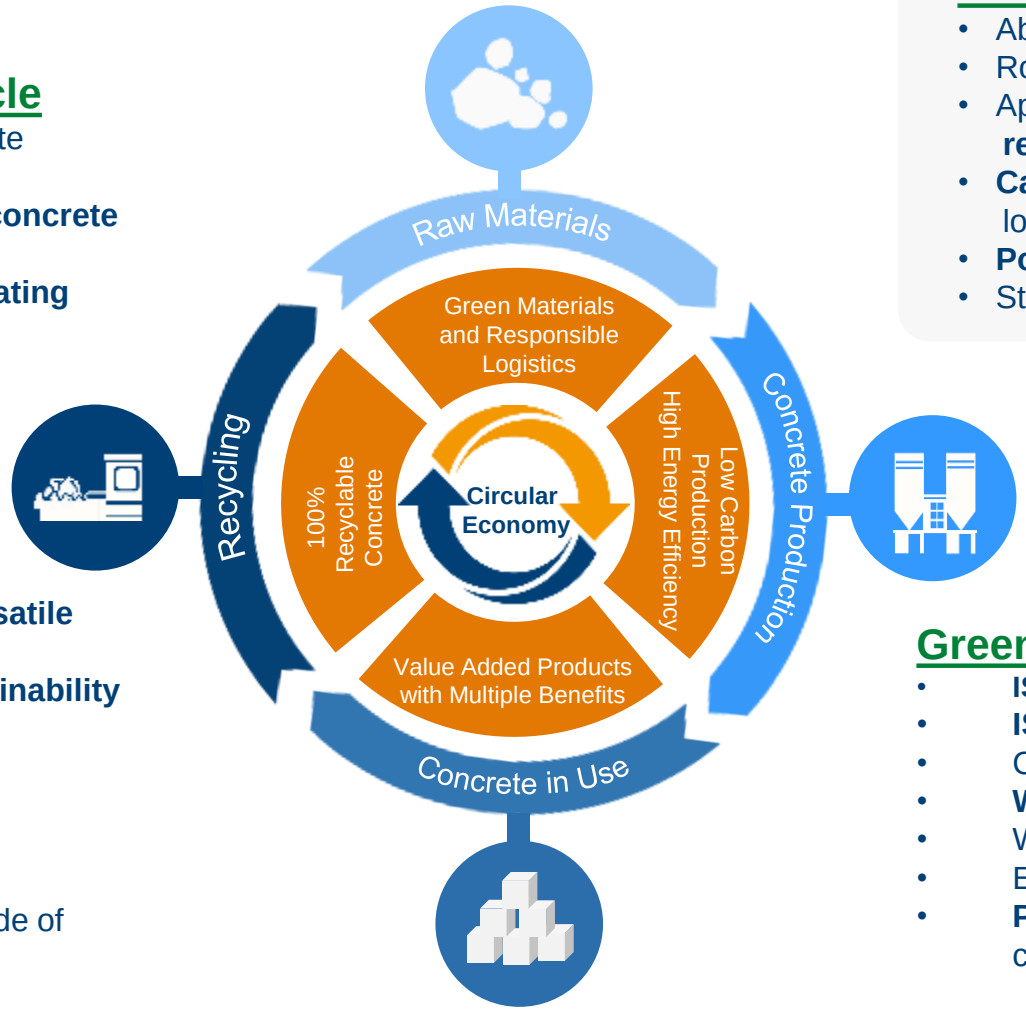
CIRCULAR ECONOMY

Reduce, Reuse, Recycle

- Recycling of returned concrete
- **Reduce waste** to landfills
- **Recycled aggregates and concrete** after special treatment
- Get credits for **BEAM Plus rating**

Value Added Products

- **Concrete: Most durable and versatile construction material**
- **Generate engineering and sustainability benefits**
- Long pumping ***SuperpumpCrete***
- Fast-to-set ***EarlyCrete***
- Ultra-light weight ***FoamCrete***
- Multifunctional ***SuperliteCrete***
- **Recycled concrete products** made of recycled aggregates



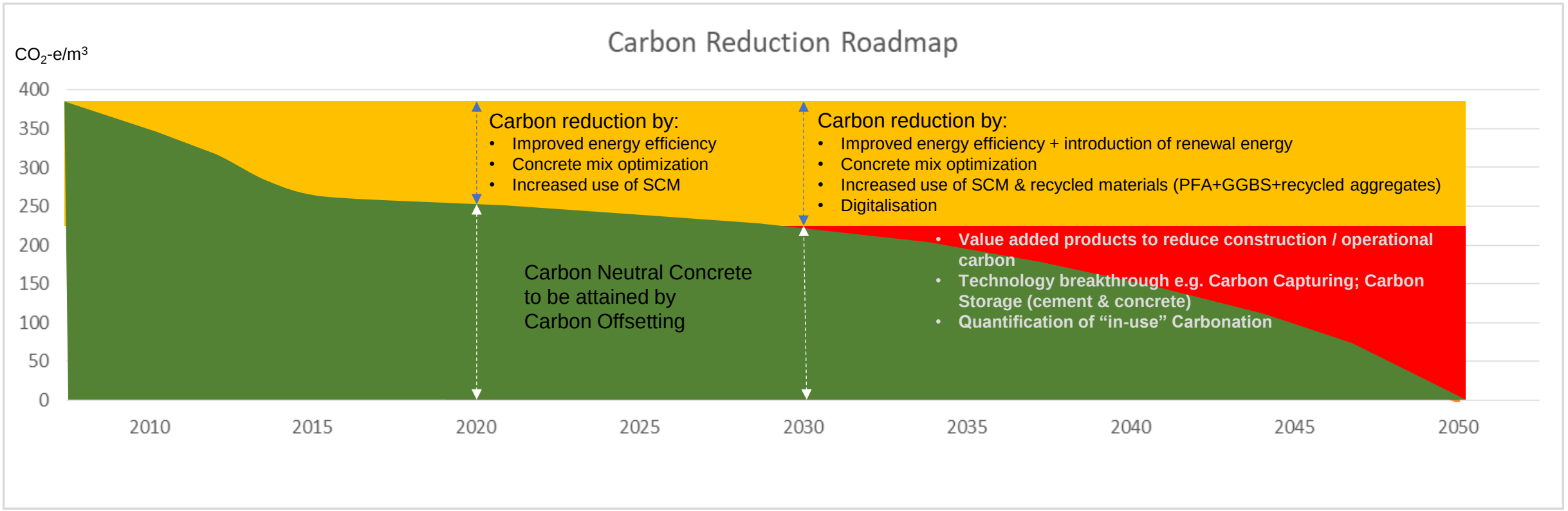
Green Supply Chain

- Abundantly available materials
- Rock products from **recognized green quarries**
- Application of **recycled materials: GGBS, PFA recycled aggregates**
- **Carbon reduction and green practices** in all logistic process
- **Pollution control** facilities in depots
- Strategically located plants to shorten delivery time

Green Management

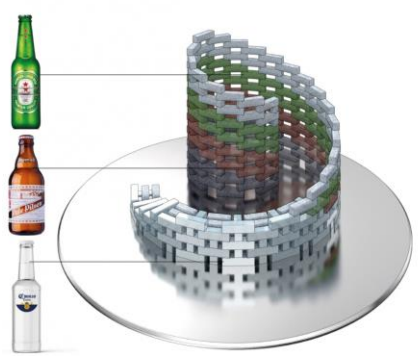
- **ISO14001** Environmental Management System
- **ISO50001** Energy Management System
- Concrete Product **Carbon Footprint**
- **Waste concrete treatment** machines
- Waste water recycling and treatment facilities
- EURO V mixer truck fleet, B5 diesel trucks
- **Pollution control**: Dust extraction system, Auto car Wash, noise enclosure

Attain carbon neutrality by science-based collaborations



Emerging low carbon construction materials: Bioclimatic/ Energy efficient/ Recycled Buildings Materials

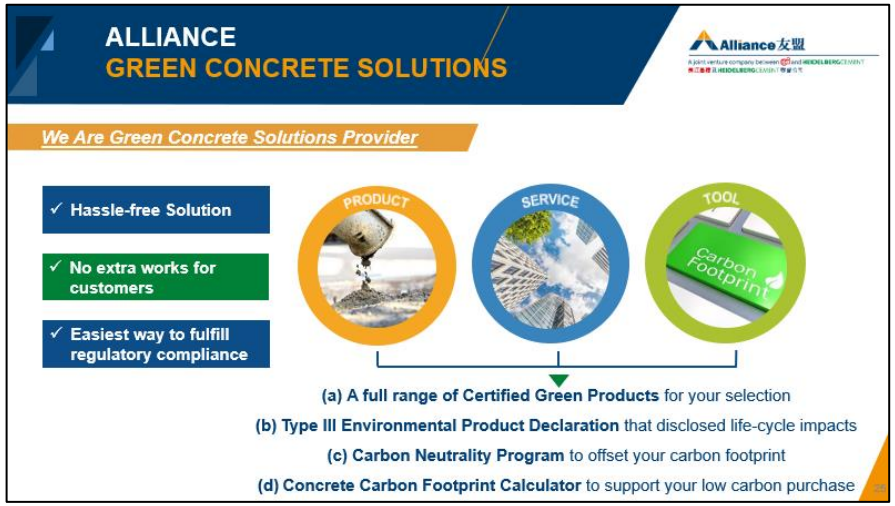
Earth-based Construction, Cork-based bricks, Hempcrete, Stone, Straw, Wool, Wood, Bamboo and other functional materials e.g. CO2 absorption additives, photovoltaic glass

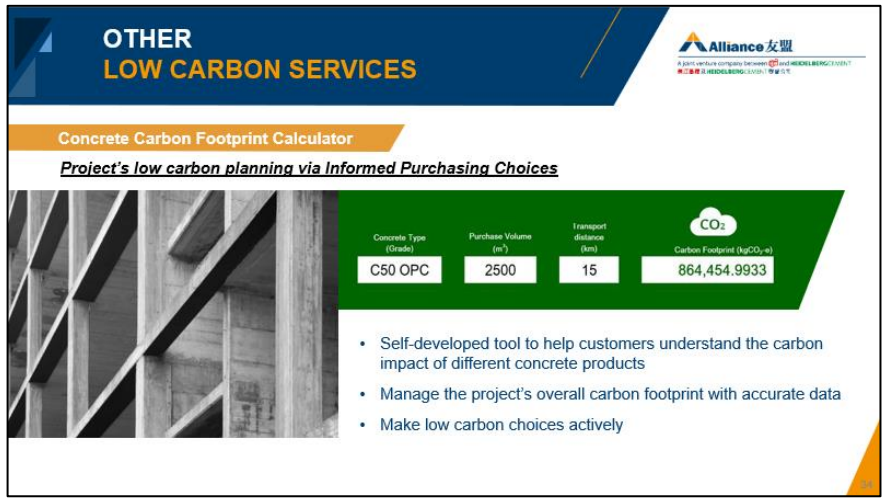


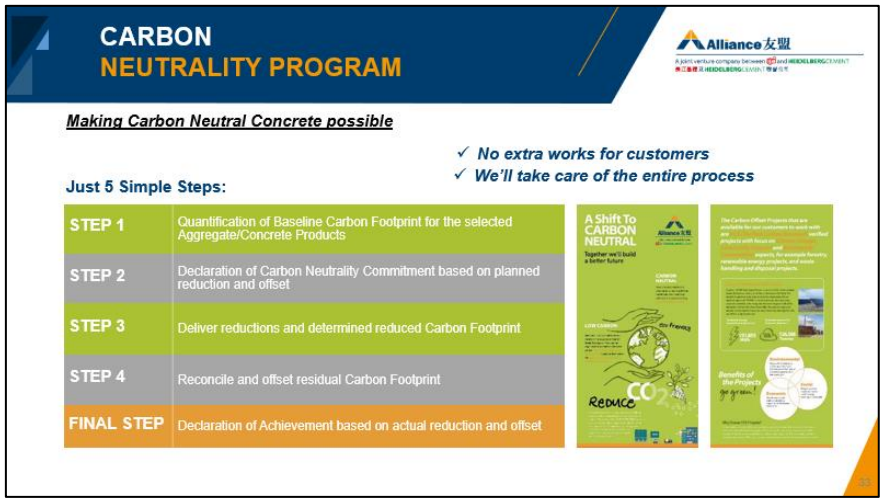
Selection Criteria:

- Properties Analysis
- Supply Chain
- Construction Practices and Methods of Application
- Cost assessment of bio-climatic constructions
- Building Regulations

Speak the same Carbon reduction language understandable by other sectors, innovative products to help sustainable designs







Possible strategic actions

- Low Carbon Materials solutions support development projects' green building assessment, and sustainable green finance
- Provide verified carbon footprint data for development projects' carbon footprinting
- Offers customers with products carbon neutrality service

- ISO50001 accredited energy management system
- Highest energy efficient production plants and logistics
- Application of renewable energy in production plants
- Innovative products facilitate the energy saving in construction and building in use stages

- Optimized logistics management system
- Highest emission standard EURO V/VI delivery truck fleet
- Application of Biodiesel
- Introduction of E-vehicles

- Circular economy model
- Green resources extraction
- Application of alternate green ingredients in Products
- Application of recycled materials in Products or for other uses
- Waste reduction & recycling processes
- Wastewater recycling in all production plants

INNOVATIVE AND LOW CARBON PRODUCTS

Alliance 友盟

A joint venture company between CRH and HEIDELBERGCEMENT

High Performance Concrete

Fairface Concrete

Colour Concrete

Lightweight Concrete

High Density Concrete

Waterproof Concrete

INNOVATIVE AND LOW CARBON PRODUCTS

Alliance 友盟

A joint venture company between CRH and HEIDELBERGCEMENT

Recycle Aggregate Concrete

Long Pumping Concrete

Durable Concrete

Underwater Antiwash Self Compacting Concrete

INNOVATIVE AND LOW CARBON PRODUCTS

Alliance 友盟

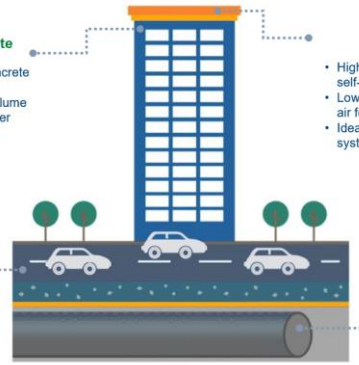
A joint venture company between CRH and HEIDELBERGCEMENT

High Performance Concrete

- Self compacting and self flow concrete
- Ultra high strength concrete (up to Grade 100) to minimize volume
- High durability concrete with longer design life and less maintenance
- Fire resistance concrete

FoamCrete™

- Highly workable, generally self-leveling and self-compacting
- Low density material incorporating entrained air for thermal insulation
- Ideal for filling disused fuel tanks, sewer systems, pipelines and culverts



EarlyCrete™

- Rapid strength development (20N/mm2 within 12 hours)
- high wear and abrasion resistance

SuperPumpCrete™

- Horizontal pumping distance: 21km
- Special designed products to suit customers' application e.g. Long tunnel

INNOVATIVE AND LOW CARBON PRODUCTS

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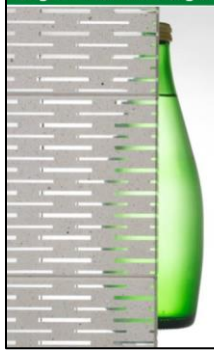
i.light - a new meaning of the word cement



i.light is a precast concrete panel that can transmit light.

It combines the strength of cementitious materials and the transparency effect typical of glassy materials.

SUSTAINABLE FUTURE OF LOW CARBON MATERIALS

Quantify environmental impacts of products and **support the project's carbon footprint quantification** and building's life cycle assessment with verified data

Provide **informed purchasing choices** of green/low carbon to developers, contractors and the building's end users

Fulfill material requirements of most widely used **Green Building Assessment** schemes in Hong Kong that include BEAM+ 2.0, LEED 4.0, BREEM…etc.

Identify reduction opportunities for embodied carbon and other environmental impacts from products manufacturing

Demonstrate your commitment on sustainability and climate protection with green purchasing actions

Enable better building design to be more versatile in applications, durable and energy efficient

Share the responsibilities and benefits among different actors to move the whole building supply chain together.

INTEGRATE THE CORE VALUE INTO EVERY ASPECT OF COMPANY MANAGEMENT

Alliance 友盟
A joint venture company between CRH and HEIDELBERGCEMENT
華江基建及HEIDELBERGCEMENT聯營公司

Commitment & experience in sustainability

2004
- Establishment of Alliance
- Determined HSEQ objectives & targets
- Put in place company principles that emphasized business ethics & integrity
- ISO9001, ISO14001, OHSAS18001 certification

2008
- Started Carbon Footprint quantification and set carbon reduction targets

2011-2012
- First Customer Service Center with optimized logistics management system & ERP system within the industry
- Obtained the 1st Concrete Product Carbon Footprint Mark in HK
- Started our voluntary reporting on Sustainability
- Stakeholder engagement & communications

2013-2014
- Identified sustainability priorities & strategies
- Started the ISO14064 GHG Verification
- Developed the Concrete Carbon Footprint Calculator to support customers' low carbon purchase

2015-2016
- Established the energy management system and obtained the ISO50001 Certification
- Aligned the Global Sustainability Goals with Alliance's sustainability priorities & targets

2017-2018
- Determined Alliance's Ambition 2030
- Circular economy model
- Digitalization transformation

2019-2021
- More than 40 concrete products awarded CIC's Green Product Certification
- 1st concrete supplier in HK to issue Type III EPD
- Carbon neutrality program offered to customers
- Carbon reduction targets align with Net Zero 2050
- Launched the CSR & Community Engagement Management Plan

I·M3 Hong Kong