



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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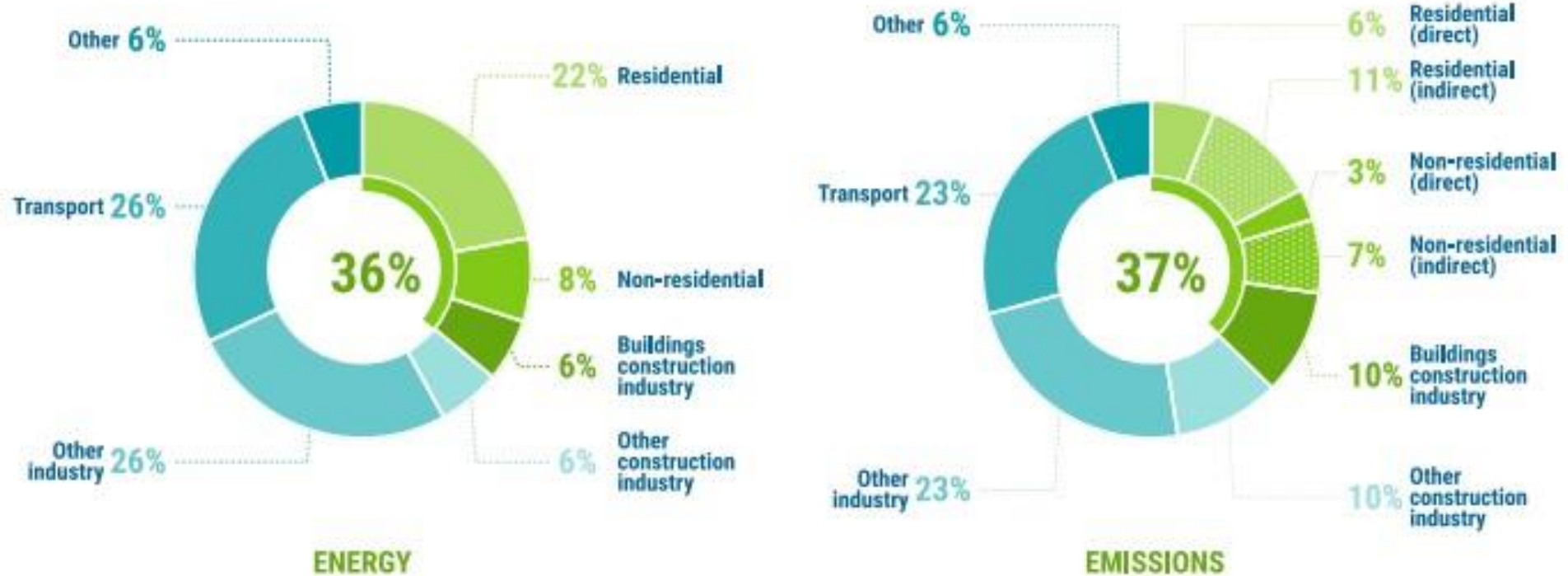
Future of low carbon construction materials

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Figure 2. Buildings and construction's share of global final energy and energy-related CO₂ 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.

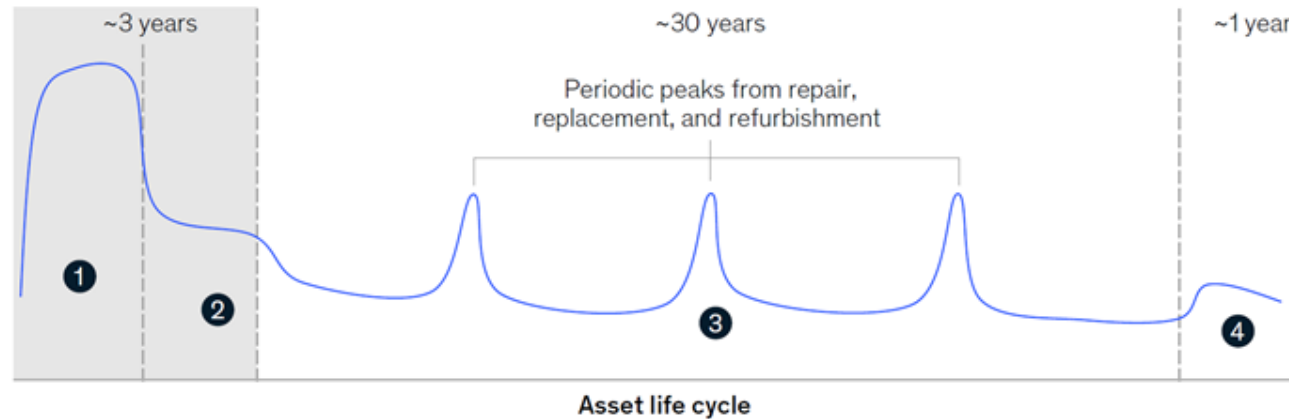
Source: IEA 2021a. All rights reserved. Adapted from "Tracking Clean Energy Progress"

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



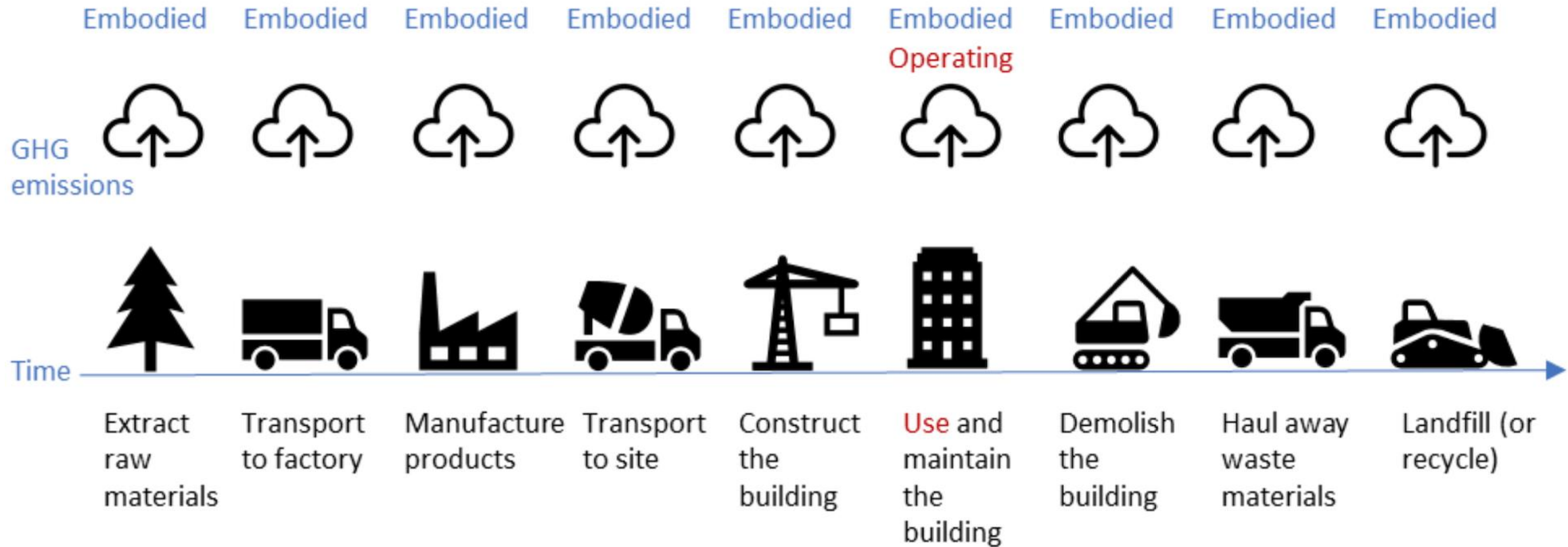
Embodied carbon is irreversible once an asset is built and accounts for up to 50 percent of the asset's lifetime emissions.

CO₂e¹ emissions² (embodied and operational) Embodied carbon before start-up (typically underreported)

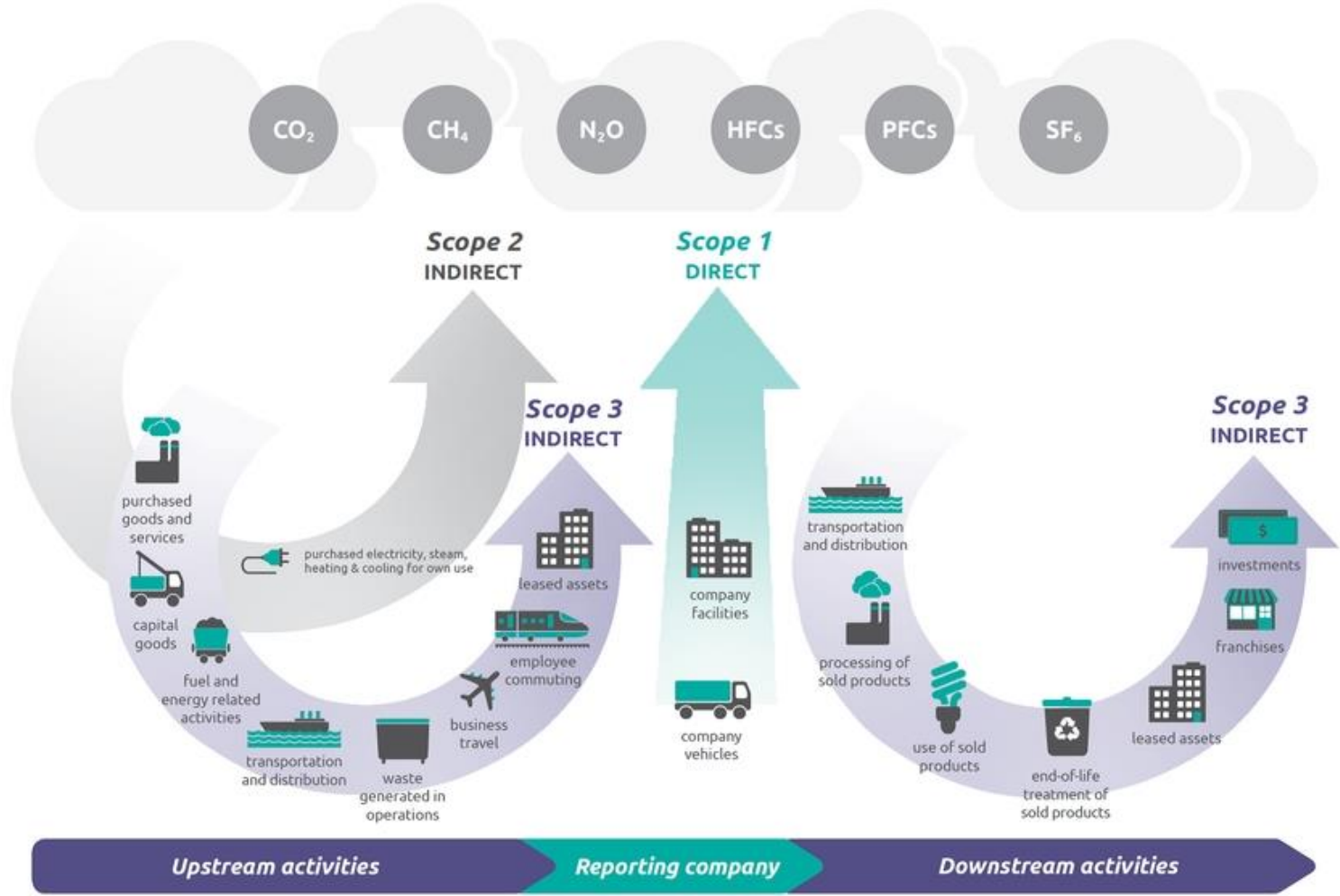


- 1 Construction material procurement**
Driven by carbon-intensive manufacturing processes for bulk construction materials such as steel, concrete, aluminum, copper, and plastic
- 2 On-site construction**
Driven by fuel consumed by heavy construction vehicles and other Scope 3 emissions (eg, workforce 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

Share the responsibilities and benefits of the Low Carbon economy



Enhance transparency and accountability



Carbon reduction blueprint (Alliance example)

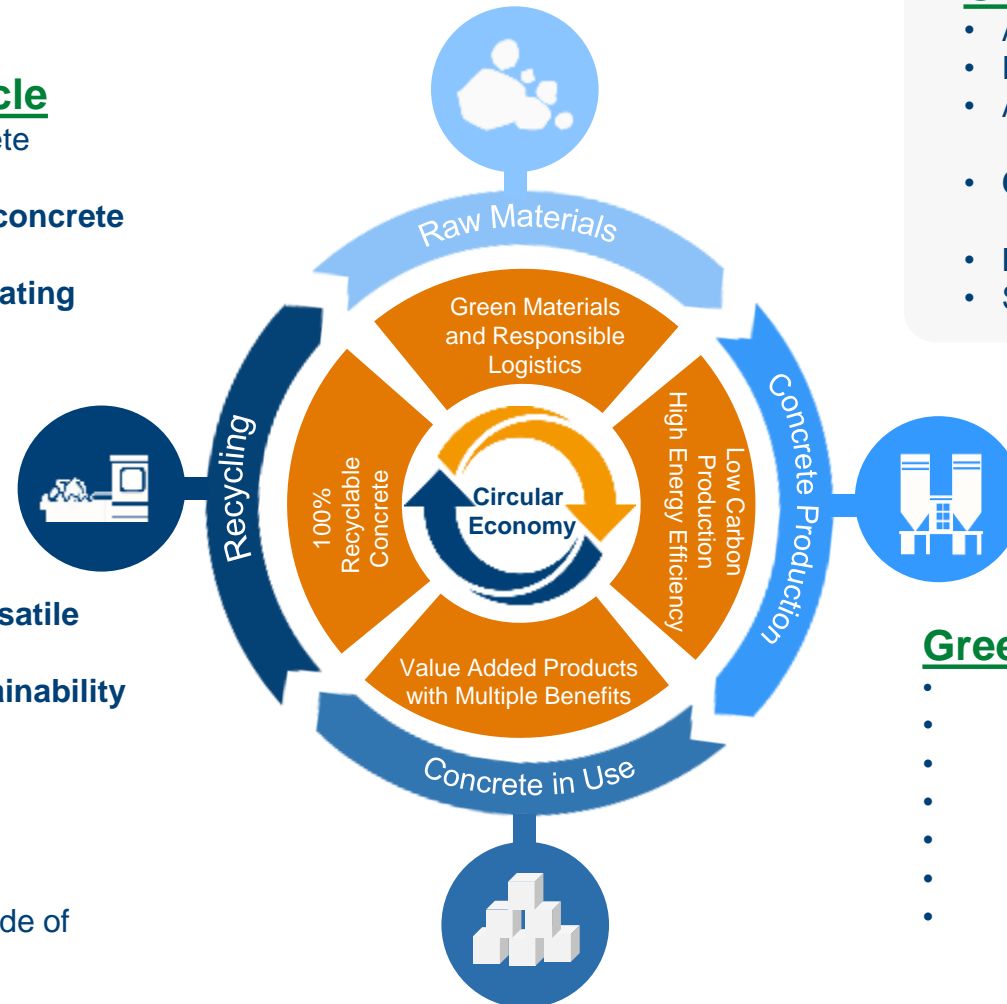
CIRCULAR ECONOMY

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



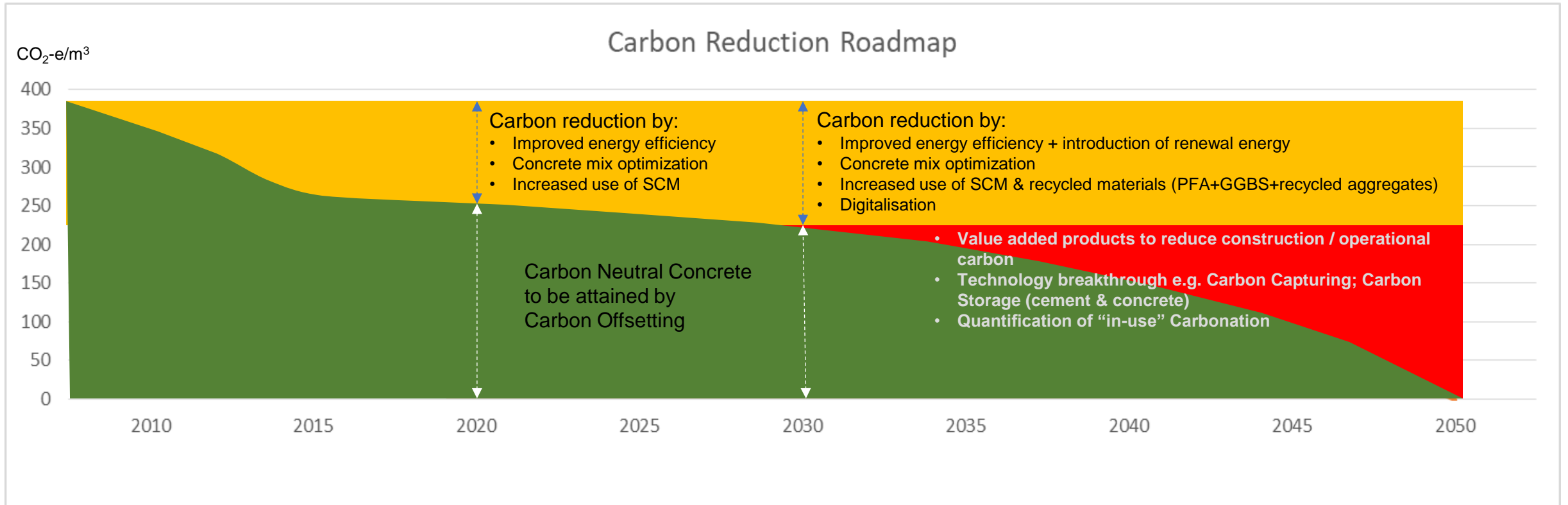
Green Supply Chain

- 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

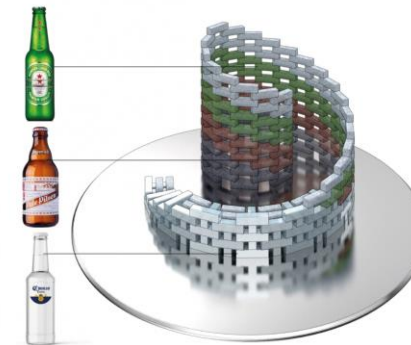
- **ISO14001** Environmental Management System
- **ISO50001** Energy Management System
- Concrete Product **Carbon Footprint**
- **Waste concrete treatment** machines
- Waste water recycling and treatment facilities
- EURO V mixer truck fleet, B5 diesel trucks
- **Pollution control:** Dust extraction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



ALLIANCE GREEN CONCRETE SOLUTIONS

We Are Green Concrete Solutions Provider

- ✓ Hassle-free Solution
- ✓ No extra works for customers
- ✓ Easiest way to fulfill regulatory compliance

PRODUCT

SERVICE

TOOL

(a) A full range of Certified Green Products for your selection
 (b) Type III Environmental Product Declaration that disclosed life-cycle impacts
 (c) Carbon Neutrality Program to offset your carbon footprint
 (d) Concrete Carbon Footprint Calculator to support your low carbon purchase

ALLIANCE GREEN CONCRETE SOLUTIONS

HOW CAN WE HELP? – YOUR MOST CAPABLE GREEN PARTNER

Certified green CONCRETE PRODUCTS (CIC Carbon Label & Type III EPD)

▶

Obtain Beam Plus / LEED 4.0 MATERIAL & WASTE credits

▶

MORE SAVING & LESS EFFORTS to obtain same credit points elsewhere

✓ No Extra Work for You
 ✓ Fulfill Specification/ Tender Requirement of Employing Supplier with Certified Green Products

OTHER LOW CARBON SERVICES

Concrete Carbon Footprint Calculator

Project's low carbon planning via Informed Purchasing Choices

Concrete Type (Grade)	Purchase Volume (m ³)	Transport distance (km)	Carbon Footprint (kgCO ₂ -e)
C50 OPC	2500	15	864,454.9933

- Self-developed tool to help customers understand the carbon impact of different concrete products
- Manage the project's overall carbon footprint with accurate data
- Make low carbon choices actively

CARBON NEUTRALITY PROGRAM

Making Carbon Neutral Concrete possible

- ✓ No extra works for customers
- ✓ We'll take care of the entire process

Just 5 Simple Steps:

STEP 1	Quantification of Baseline Carbon Footprint for the selected Aggregate/Concrete Products
STEP 2	Declaration of Carbon Neutrality Commitment based on planned reduction and offset
STEP 3	Deliver reductions and determined reduced Carbon Footprint
STEP 4	Reconcile and offset residual Carbon Footprint
FINAL STEP	Declaration of Achievement based on actual reduction and offset

Summary of Hong Kong's Climate Action Plan 2050

Vision — Zero-carbon Emissions • Liveable City • Sustainable Development

Retrospect and Prospect

Decarbonisation

Over the past decade, the Government has allocated over \$47 billion to implement various carbon reduction measures. The two power companies have also allocated about \$39 billion to decarbonisation projects.

Reduce Coal for Electricity Generation
Reduce the share of coal in the fuel mix for electricity generation from around half in 2015 to less than a quarter.

Energy Saving and Green Buildings
About 2.1 billion kWh of electricity was saved in 2020 as compared with 2015 (-4.7%).

Electric Vehicles (EVs)
In the first half of 2021, one out of every five newly registered private cars is EV.

Adaptation and Resilience

The Climate Change Working Group on Infrastructure: Major Studies

Strengthening Infrastructure

- Study on resilience of Government critical infrastructure in Hong Kong under extreme weather
- Sensitivity test under direct hit by super typhoons
- Frequency analysis of extreme sea levels

Tropical Cyclones

- Projection of extreme winds

Extreme Temperatures

- Study on potential impacts on Government infrastructure under extreme temperatures

Reduce Flood Risk

Eliminated 127 flooding blackspots, improvement works for the remaining 4 blackspots will be completed in phases.

Contingency Plan for Natural Disasters

Inter-departmental Steering Committee chaired by the Chief Secretary for Administration to handle natural disasters of a substantial scale

Contingency Plan for Transport Systems

Update contingency plans to handle emergency situations at major transport infrastructure

Emergency Alert System

Disseminate messages to mobile users during emergency situations to remind the public to adopt contingency measures

Strategies • Opportunities

Moving towards carbon neutrality can bring ample and diverse development opportunities, enhance Hong Kong's competitiveness and support sustainable development.

Steering and Coordination
The Steering Committee on Climate Change and Carbon Neutrality under the chairmanship of the Chief Executive to formulate the overall strategy

Climate Budget
Allocate **\$240 billion** to combat climate change in the next 15 to 20 years

Office of Climate Change and Carbon Neutrality
Set up a new office to strengthen coordination and promote decarbonisation

Advisory Committee
Establish a dedicated advisory committee to encourage public participation, including young people

Public Engagement
Government to work together with different sectors to promote low-carbon lifestyle

Green Finance
Accelerate the development of green and sustainable finance, develop Hong Kong into a green financial hub in the region

Green Economy
Facilitate the development of green industries, create investment and job opportunities

Technology and Innovation
Promote ICT development and re-industrialisation, facilitate the application of decarbonisation technologies and green R&D

Capacity Building
Climate change-related content to be incorporated into the curricula of tertiary institutions

Carbon-neutral Communities
Develop strategic growth areas into carbon-neutral communities

Net-zero Electricity Generation • Energy Saving and Green Buildings

In 2019, electricity generation accounted for about 66% of total carbon emissions. Hong Kong will gradually reduce the use of fossil fuel and expedite the use of clean zero-carbon energy.

No Coal for Electricity Generation

2035
Cease using coal for daily electricity generation, to be replaced by low to zero-carbon energy

Zero-carbon Energy

2035 60-70%
Trial of new energy and closer cooperation with neighbouring areas to increase the supply of zero-carbon electricity

Electricity Saving in Buildings

2035
Electricity consumption (Compared with 2015)
(Reduce by 30-40% subsequently)

Renewable Energy (RE)

2035 7.5-10%
(Increase to 15% subsequently)
Public and private sectors to develop RE proactively to increase its share in the fuel mix for electricity generation

Cooperation and Innovation
Seek investment and development opportunities, participate in and operate zero-carbon energy projects near Hong Kong

Strengthening Regulation
Continuous enhancement of energy performance of buildings

- Expand the scope of regulation to cover all buildings with high energy consumption
- Conduct more frequent energy audits
- Implement the identified energy management opportunities
- Strengthen the promotion of retro-commissioning

Smart Management
Use smart technologies to enhance energy saving management and energy efficiency of buildings and infrastructure

Incorporate district cooling systems in development projects

Explore setting a minimum energy efficiency requirement for specified appliances

Green Transport

Transport constituted about 18% of total carbon emissions in 2019. Popularisation of EVs and other new energy transport can help the transport sector achieve zero carbon emissions.

Clean Air Plan for Hong Kong 2035
Hong Kong Roadmap on Popularisation of Electric Vehicles

2035
Implement strategies in the Clean Air Plan to promote adoption of new energy transport to expedite low-carbon transformation

2050
Take forward measures set forth in the EV Roadmap to attain zero vehicular emissions before 2050

Hydrogen Fuel Cell Vehicles
Test out hydrogen fuel cell electric buses and heavy vehicles

Electric Private Cars
Cease the new registration of fuel-propelled and hybrid private cars in 2035 or earlier

New Energy Transport
Progressively adopt new energy ferries

Waste Reduction

Waste accounted for about 7% of total carbon emissions in 2019. Developing waste-to-energy facilities and promoting waste reduction and recycling will enable us to move away from reliance on landfills for municipal waste disposal.

Waste Blueprint for Hong Kong 2035

2035
Implement the Waste Blueprint for Hong Kong 2035 to realise the vision of "Waste Reduction • Resources Circulation • Zero Landfill"

Municipal Solid Waste Charging Scheme
2023
Prepare for implementation of waste charging, encourage waste reduction and recycling, and strengthen community facilities and support

Regulation of Disposable Plastic Tableware
2025
Regulate disposable plastic tableware, etc. in phases, reduce plastic at source

Waste-to-energy Climate
2035
Develop adequate waste-to-energy facilities, move away from reliance on landfills for municipal waste disposal

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 HONGKONG CONCRETE and HEBEI NINGBO CONCRETE
中國建築材料集團有限公司 中國北新集團有限公司

High Performance Concrete		Fairface Concrete	
Colour Concrete		Lightweight Concrete	High Density Concrete
Waterproof Concrete			

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中國建築材料集團有限公司 中國北新集團有限公司

Recycle Aggregate Concrete		Long Pumping Concrete	
Durable Concrete		Underwater Antiwash Self Compacting Concrete	

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中國建築材料集團有限公司 中國北新集團有限公司

<p>High Performance Concrete</p> <ul style="list-style-type: none"> 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 	<p>FoamCrete™</p> <ul style="list-style-type: none"> 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
<p>EarlyCrete™</p> <ul style="list-style-type: none"> Rapid strength development (20N/mm² within 12 hours) high wear and abrasion resistance 	<p>SuperPumpCrete™</p> <ul style="list-style-type: none"> Horizontal pumping distance: 21km Special designed products to suit customers' application e.g. Long tunnel

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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

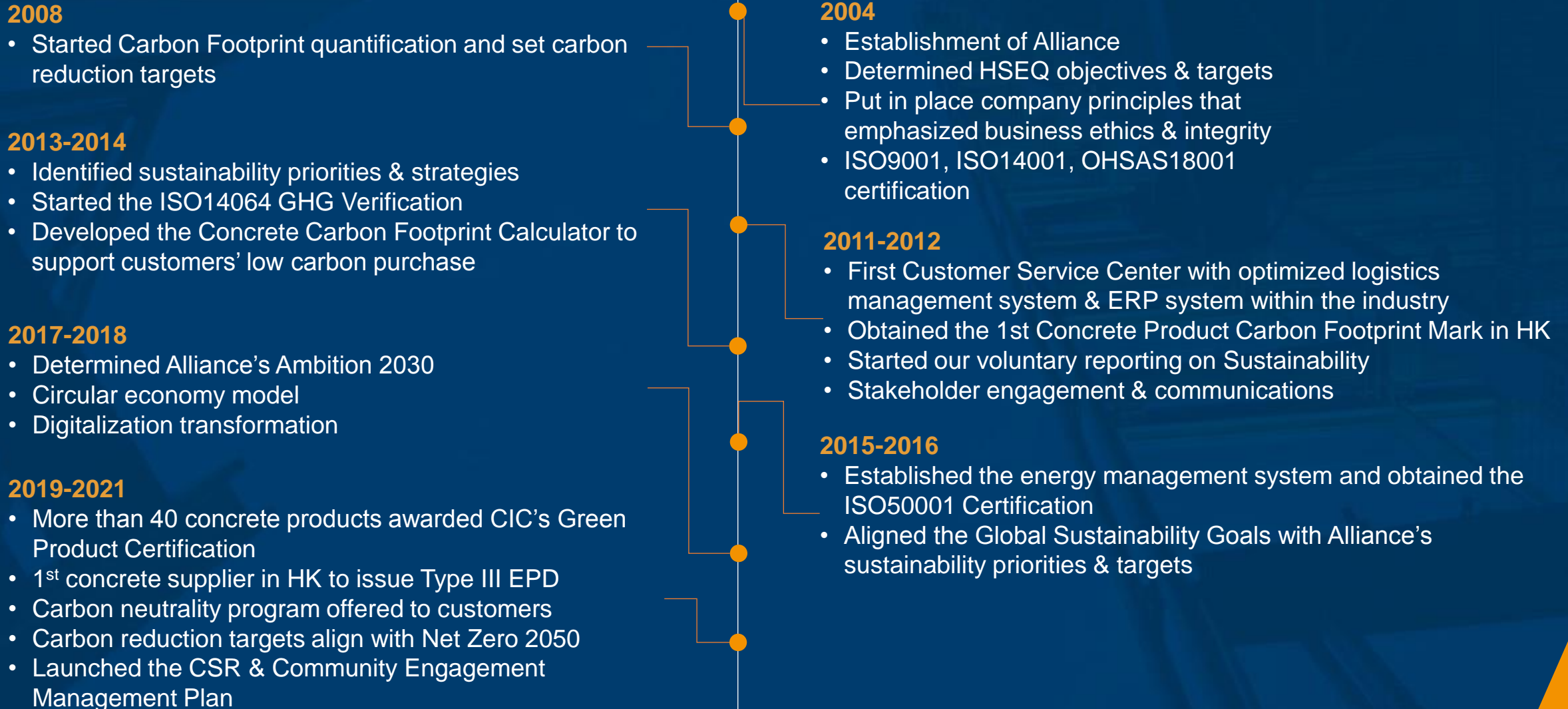
Demonstrate your commitment on sustainability and climate protection with green purchasing actions

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

Commitment & experience in sustainability



THANK YOU