

# 2023 CLIMATE REPORT



## INTRODUCTION

In 2023 we accelerated progress across all our decarbonization targets.



## CLIMATE HIGHLIGHTS 2023

20%

Reduction in CO<sub>2</sub>/net sales<sup>1</sup>

3%

Reduction in CO<sub>2</sub> net/ton of cementitious material<sup>2</sup>

6

CCUS projects in execution

5M

Tons of CO<sub>2</sub> /annum captured by 2030

8.4M

Tons of CDM recycled

+24%

Recycling of CDM<sup>2</sup>

<sup>1</sup> 2023 Scope 1 + Scope 2 CO<sub>2</sub> emissions per million of net sales compared to 2022

<sup>2</sup> Compared to 2022



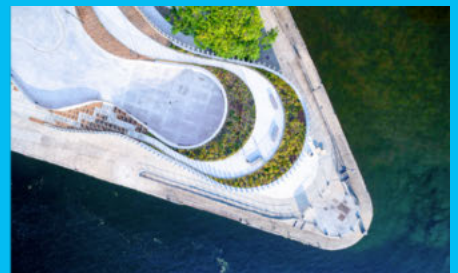
### CLIMATE LEADERSHIP

 P4



### DRIVING CIRCULARITY

 P38



### ADVOCACY AND ENGAGEMENT

 P46



## CONTENTS

### 2 CEO's and Chief Sustainability Officer's Letter

#### CLIMATE LEADERSHIP

- 8 Decarbonizing Holcim
- 12 Decarbonizing our solutions
- 16 Decarbonizing our energy mix
- 24 Decarbonizing our mobility
- 26 Driving advanced technologies
- 28 Advancing carbon capture, utilization and storage technology
- 34 Sustainable construction
- 36 Reinventing concrete

#### DRIVING CIRCULARITY

- 40 Driving circularity to build new from old
- 42 Circular living
- 44 From sea to city

#### ADVOCACY AND ENGAGEMENT

- 48 Advocacy positions and transparency
- 54 Just Transition
- 58 Holcim Foundation

#### CLIMATE REPORTING

- 62 Climate governance
- 64 Climate-related risks and opportunities
- 80 Scenario analysis
- 84 Performance data tables

## LEADING IN ESG DISCLOSURES & TRANSPARENCY

Read more about our transparent ESG disclosures in the *2023 Integrated Annual Report*.

- Art. 964b Swiss Code of Obligations. Read on page 434
- EU Taxonomy. Read on page 266
- TCFD. Read on page 238
- TNFD. Read on page 238

## INTRODUCTION

# DEAR STAKEHOLDERS,

We are decarbonizing Holcim for people and the planet, from our operations and solutions through to buildings in use.



**Jan Jenisch**  
Chairman & CEO



**Nollaig Forrest**  
Chief Sustainability  
Officer



**“With climate at the core of our strategy, Holcim is leading the shift to low-carbon, circular and energy-efficient building solutions.”**

**JAN JENISCH**  
Chairman & CEO

In 2023 Holcim delivered record results and achieved its Strategy 2025 financial targets two years ahead of plan, while advancing its leadership in sustainability. With climate at the core of our strategy, we are making decarbonization a driver of profitable growth and accelerating green growth with our advanced building solutions.

Cities are where more than half of us live, and where 80 percent of greenhouse gas emissions occur. With the building sector at the backbone of urbanization, Holcim is playing a central role in creating a future that works for people and the planet.

Taking a rigorous science-driven approach, Holcim is accelerating the shift to circular cities. In this decade of action to 2030, we are executing our net-zero 1.5°C-aligned targets with speed and scale to decarbonize building across its lifecycle.

In 2023, we made progress across all our decarbonization targets, reducing CO<sub>2</sub> per net sales by 20 percent. Region Europe even launched our industry’s most ambitious targets, to reach 285 kg CO<sub>2</sub> net per ton of cementitious by 2030, a 45 percent reduction versus 2020.

Making net-zero cement a reality, we aim to deliver eight million tons of fully decarbonized cement a year by 2030. We owe this breakthrough to six carbon capture, utilization and storage (CCUS) projects that we are executing to capture five million tons of CO<sub>2</sub> per annum by 2030.

CCUS complements our other decarbonization levers. Expanding our low-carbon formulation, we advanced use of innovative raw materials like calcined clay, which reduces the carbon footprint of cement by up to 50 percent, and accelerated our shift to decarbonized energy: expanding use of alternative fuels while advancing our share of renewable electricity globally.

Driving circular construction across key metropolitan areas, we launched ECOCycle®. Using this proprietary circular technology platform, we are accelerating urban mining, increasing recycling of construction demolition materials into new building solutions by 24 percent in 2023.

**“In 2023, we accelerated climate action, making progress across all of our decarbonization levers to lead the transition to sustainable building.”**

**NOLLAIG FORREST**  
Chief Sustainability Officer

We gained recognition for our leadership in this area by winning the Circular Transition Award at the Reuters Responsible Business Awards, as well as the Lighthouse Award for circularity at the World Economic Forum. We signed a partnership with the Ellen MacArthur Foundation to accelerate circularity, collaborating on a series of ambitious initiatives.

In a year when Holcim achieved record results, we accelerated green growth with our billion Swiss-franc sustainable brands. ECOPlanet low-carbon cement reached more than CHF two billion in net sales, while ECOPact low-carbon concrete delivered more than CHF one billion in net sales.

Sustainability is inseparable from our business, and we reached a new level of disclosure this year as well, integrating this Climate Report within our Annual Report for the first time, sharing our EU Taxonomy results, and aligning with the non-financial reporting requirements of the Swiss Code of Obligations (page 434 in the [2023 Integrated Annual Report](#)).

During this exciting time for our sector, breakthrough innovations are unlocking sustainable solutions at scale. At Holcim, we are transforming the way the world builds for a net-zero future.



**JAN JENISCH**  
Chairman & CEO



**NOLLAIG FORREST**  
Chief Sustainability Officer



# CLIMATE LEADERSHIP

We are decarbonizing Holcim for people and the planet, from our operations and solutions through to buildings in use.

CityLife in Milan, Italy, is one of the most important urban redevelopment projects in Europe. Two iconic skyscrapers set in a new park, a brand new shopping district and a new metro line have all been built with Holcim products



**IN THIS SECTION**

- 8** Decarbonizing Holcim
- 12** Decarbonizing our solutions
- 16** Decarbonizing our energy mix
- 24** Decarbonizing our mobility
- 26** Driving advanced technologies
- 28** Advancing carbon capture, utilization and storage technology
- 34** Sustainable construction
- 36** Reinventing concrete

**CASE STUDY**

# Decarbonization in Europe

Leveraging an advanced regulatory environment, we have set the industry's most ambitious targets to make decarbonization a profitable growth driver in Europe.

Meeting customers' sustainability needs, Holcim is expanding its multi-billion brands delivering premium margins. By 2030 we aim to grow our low-carbon cement ECOPlanet to reach more than 50 percent of cement net sales, and produce eight million tons of fully decarbonized cement each year.

Making circularity a driver of profitable growth, we want to increase our ECOCycle® circular technology platform to 150 sites in Europe by 2030, to recycle 20 million tons of construction demolition materials per annum.

We are accelerating CCUS too. Six full-scale projects have been selected for EU funding to capture five million tons of CO<sub>2</sub> annually by 2030, while delivering high returns, with eight additional projects in development

 [Learn more on our website](#)

**“Europe offers the most advanced regulatory environment in the world to accelerate the transition to net zero, from the EU green deal to carbon pricing.”**

**MILJAN GUTOVIC**

Region Head Europe and CEO Designate

CLIMATE

# MAKING PROGRESS ACROSS ALL DECARBONIZATION LEVERS

ACCELERATING GREEN GROWTH  
IMPACT DASHBOARD

2023 IMPACT

**ECOPACT READY-MIX NET SALES**

19%

ON TRACK

**TONS OF CONSTRUCTION DEMOLITION MATERIALS RECYCLED**

8.4M

ON TRACK

**GREEN CAPEX CHF**

402M

ON TRACK

**SUSTAINABLE FINANCE**

40%



**REDUCTION CO<sub>2</sub> NET/T CEM YEAR-ON-YEAR**

3%



## RECOGNIZED CLIMATE AND NATURE LEADERSHIP



DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

First in sector with SBTi-validated net-zero targets



Piloting science-based targets for nature



Signatory since 2017 with aligned reporting



Taskforce member and early adopter



2025 IMPACT

25%

10M

500M

40%

2%-4%

BY 2030

AMBITIONS FOR A 1.5°C FUTURE

5M

Tons of CO<sub>2</sub> captured each year in Europe using CCUS

2BN

Investment in CCUS CHF

8M

Tons of net-zero cement per annum

BUSINESS AMBITION FOR 1.5°C   OUR ONLY FUTURE



'Energy Transition Changemaker'



'Circularity Lighthouse Award'



Co-funded by the European Union  
Emissions Trading System  
Innovation Fund

Six CCUS projects selected for EU grants

CLIMATE

# DECARBONIZING HOLCIM TO BECOME NET-ZERO

At Holcim, we take a science-driven approach to becoming a net-zero company. In 2023, we made strong progress towards our targets, which are in line with the 1.5°C framework.

**Our net-zero pledge**

With climate action at the core of Holcim’s strategy, we have 2030 and 2050 net-zero targets in line with the 1.5°C framework validated by the Science Based Targets initiative (SBTi) for all three scopes.

**Our Climate Policy**

Holcim’s approach towards accelerating climate action while enabling a Just Transition and climate adaptation are described in our Climate Policy. The main principle of our policy is the delivery of our actions in a rigorous, science-based manner, to execute our net-zero journey. We comply with local, state, federal and national regulations in all our operations and advocate for collective actions with relevant stakeholders.

➔ Read more about climate- and nature-related risks and opportunities on page 64



**What is new?**

We have further updated our 2030 and 2050 targets by:

- Upgrading our combined Scope 1 & 2 2030 targets to meet the latest SBTi validation criteria
- Extending our 2050 target coverage to include all 15 categories of Scope 3 emissions

**FOR YEARS, HOLCIM HAS BEEN AT THE FOREFRONT OF CLIMATE ACTION:**

2020	2020 / 2021	2021 / 2022	2023	2023
<p>In 2020, Holcim was the first global building solutions company to sign the United Nations Global Compact’s ‘Business Ambition for 1.5°C’ initiative, with intermediate 2030 targets approved by SBTi.</p>	<p>In 2020, we launched ECOPact concrete, and followed that in 2021 with the launch of ECOPlanet cement, to offer the broadest range of low-carbon solutions.</p>	<p>In 2021, Holcim was first in its sector with SBTi-validated 2030 and 2050 net-zero targets. In 2022, we upgraded our 2030 targets to align with our sector’s new 1.5°C science-based framework.</p>	<p>In 2023, Holcim was selected for funding from the European Union (EU) Innovation Fund for six of its breakthrough carbon capture, utilization and storage (CCUS) projects in Germany, Poland, Greece, France, Croatia and Belgium.</p>	<p>Holcim committed to producing eight million tons of fully decarbonized cement per annum by 2030, thanks to the six CCUS projects in Europe that are planned to go live before 2030. One of the projects, Lägerdorf in Germany, won two awards at COP28.</p>



### OUR SBTi TARGETS ALIGNED WITH 1.5°C

Holcim commits to reaching net-zero greenhouse gas emissions (GHG) across the value chain by 2050.

#### Near-term targets

Holcim commits to reduce gross Scope 1 and 2 GHG emissions by 26.2 percent per ton of cementitious materials by 2030 from a 2018 base year.<sup>1</sup> This is equivalent to a 25 percent reduction in absolute emissions within the same timeframe.

By 2030, Holcim commits to reduce gross Scope 3 GHG emissions per ton of purchased clinker and cement by 25.1 percent, from a 2020 base year.

In addition, Holcim commits to reduce Scope 3 GHG emissions from fuel and energy-related activities by 20 percent per ton of purchased fuels and Scope 3 GHG emissions from downstream transport and distribution by 24.3 percent per ton of materials transported by 2030.<sup>2</sup>

#### Long-term targets

Holcim commits to reduce Scope 1 and Scope 2 GHG emissions by 95 percent per ton of cementitious materials by 2050 from a 2018 base year.<sup>1</sup> Holcim commits to reduce absolute Scope 3 GHG emissions 90 percent by 2050 from a 2020 base year.<sup>3</sup>




With these upgraded targets, we have confirmed our commitment to decarbonize building following the most advanced science.

#### From climate to nature

Leveraging our rigorous science-driven approach from climate to nature, Holcim was selected as one of only 17 companies to pilot our world’s first science-based targets for nature. This builds on Holcim’s industry-first measurable approach to nature, developed with the International Union for Conservation of Nature (IUCN), the Biodiversity Indicator Reporting System (BIRS), to enable a nature-positive future.

[Read more on page 125 in the 2023 Integrated Annual Report](#)



	Target Base Year	2018	2023	2030	2050
<b>SCOPE 1</b> KG CO <sub>2</sub> / T cementitious		623	587	-23.3% <sup>4</sup>	-95% 
		590 <sub>net</sub>	545 <sub>net</sub>	420 <sub>net</sub>	
<b>SCOPE 2</b> KG CO <sub>2</sub> / T cementitious		46	36	-65% <sup>4</sup>	-90% 
<b>SCOPE 3</b>	2020				
PURCHASED CLINKER AND CEMENT KG CO <sub>2</sub> / T cementitious		710	702	-25.1%	-90% 
PURCHASED FUELS KG CO <sub>2</sub> / T cementitious		286	283	-20%	
DOWNSTREAM TRANSPORTATION KG CO <sub>2</sub> / T cementitious		11	9	-24.3%	

<sup>1</sup> The target boundary includes land-related emissions and removals from bioenergy feedstocks  
<sup>2</sup> These targets were validated by SBTi in alignment with a 2°C scenario  
<sup>3</sup> Target boundary includes 95 percent of Scope 1 and 2 emissions and 90 percent of Scope 3 emissions, per SBTi standard  
<sup>4</sup> Equivalent to the SBTi validated combined Scope 1 and 2 ambition of -26.2 percent

CLIMATE

# OUR CO<sub>2</sub> FOOTPRINT AND PATHWAY TO NET ZERO

Holcim is committed to reducing its carbon footprint across its operations and value chain (Scopes 1, 2 and 3), to become a net-zero company by 2050.

**Scope 1**

Scope 1 emissions account for 59 percent of our footprint and are at the core of our emissions reduction strategy. Scope 1 includes all emissions released directly from our operations. Most come from cement production. Thirty-nine percent of our emissions are generated by the raw materials we use to produce clinker. Fuel combustion necessary to heat cement kilns is another significant emissions source. A small share of Scope 1 emissions come from Solutions & Products, Aggregates and Ready-mix operations.

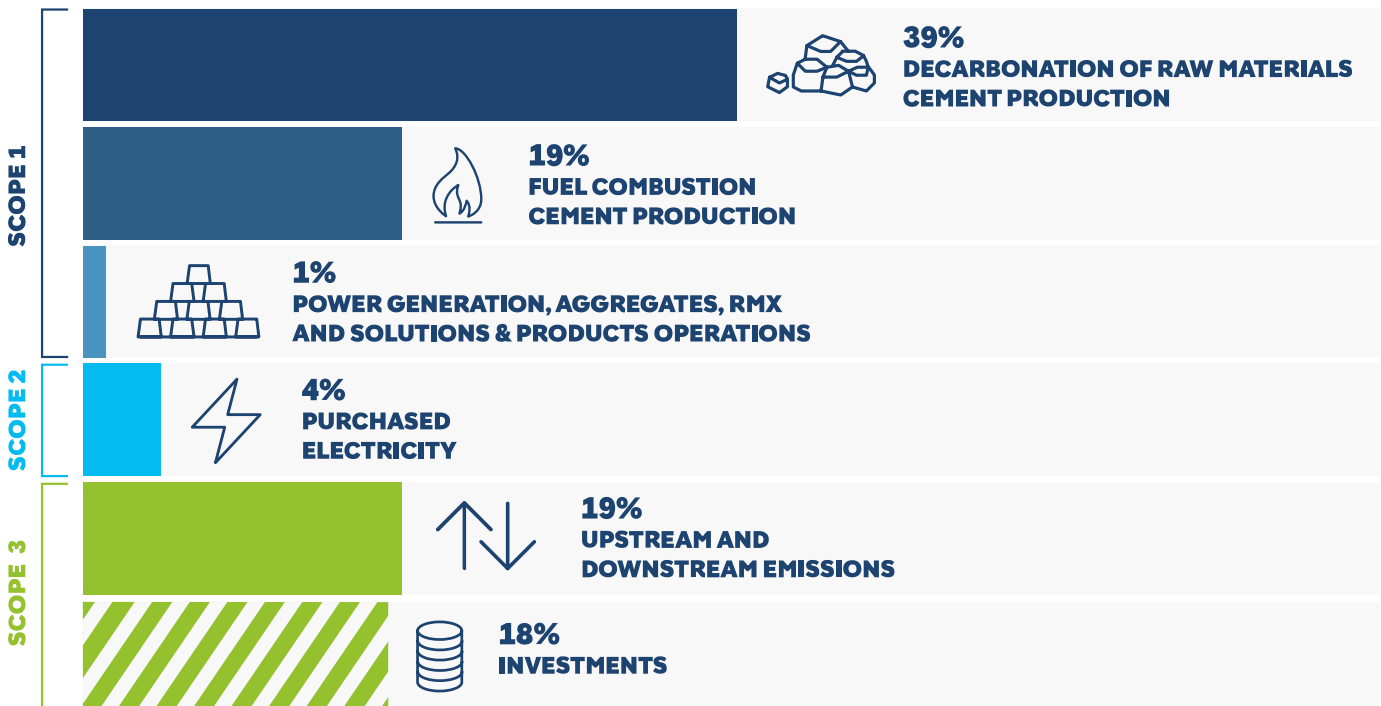
**Scope 2**

Scope 2 emissions account for four percent of our carbon footprint. Scope 2 includes indirect emissions from the generation of purchased electricity consumed in the company's owned or controlled equipment.

**Scope 3**

Scope 3 emissions account for 37 percent of our carbon footprint. Scope 3 includes all other indirect emissions generated in our value chain, such as for transportation and the extraction and production of purchased materials and fuels. Scope 3 also includes direct emissions from non-consolidated companies and investments.

➔ For more on our Scope 3 emissions, see page 22



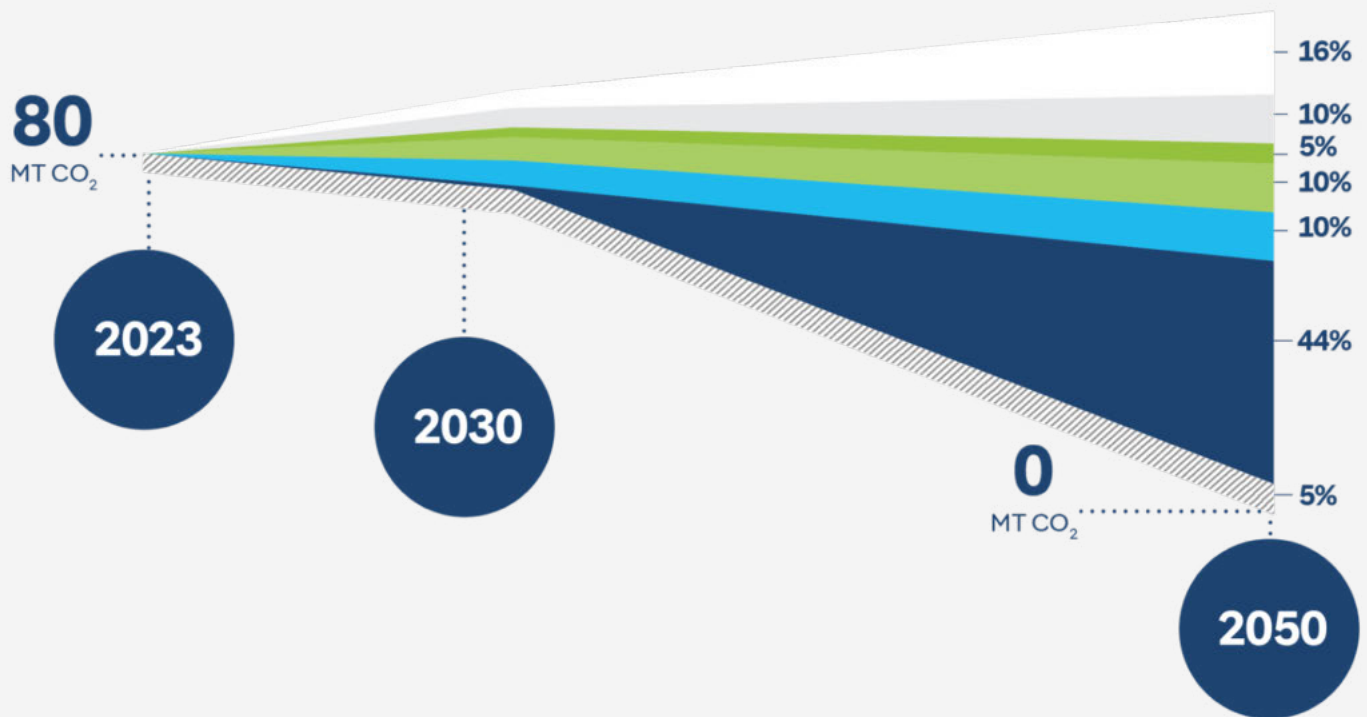


# HOLCIM'S PATHWAY TO NET ZERO

Our pathway to 2030 and 2050 is clear. To reach our Scope 1 and Scope 2 commitments, we will reduce our clinker factor, use alternative fuels and raw materials, and increase our use of renewable energy. We will invest in proven technologies that produce positive returns.

We will scale up breakthrough technologies such as Carbon Capture, Utilization and Storage (CCUS), which will make an increased contribution in terms of reaching our targets post 2030. Our pathway to net zero does not rely on offsets.

## OUR ABSOLUTE SCOPE 1 + SCOPE 2 EMISSIONS PATHWAY



<b>Efficiency gains in design &amp; construction</b>	Leveraging smart design and low-carbon formulation of concrete, as an increased focus on upfront carbon per m <sup>2</sup> moves the market to more carbon-efficient construction
<b>Efficiency gains in concrete</b>	
<b>Decarbonized electricity</b>	Increasing the share of decarbonized electricity by leveraging power purchase agreements and onsite renewable electricity, together with decarbonization of the electrical grid
<b>Less clinker in cement</b>	Replacing clinker in our final cement products with mineral components, such as calcined clay and novel binders, we aim to reduce our clinker factor from 72 percent in 2023 to 68 percent in 2030
<b>Less CO<sub>2</sub> in clinker</b>	Producing clinker with decarbonized raw materials, increasing energy efficiency and transitioning to alternative fuels. Our thermal substitution rate will increase to 50 percent in 2030 and 70 percent in 2050
<b>CCUS and other advanced technologies</b>	With advanced technologies such as carbon capture, utilization and storage (CCUS) and other breakthrough process innovations, we aim to capture five million tons of CO <sub>2</sub> and produce eight million tons of fully decarbonized cement per year by 2030
<b>Passive recarbonation</b>	Natural reabsorption of CO <sub>2</sub> during the lifetime of concrete products

# CLIMATE DECARBONIZING OUR SOLUTIONS

We offer a broad range of sustainable building solutions and use our formulation expertise to decarbonize our concrete and cement.

ECOPact and ECOPlanet both offer CO<sub>2</sub> reductions of at least 30 percent compared to standard (CEM I/OPC) local concrete and cement, respectively.

### Alternative raw materials

The majority of emissions from the cement production process results from the calcination of limestone into clinker. This part of the process is our largest source of CO<sub>2</sub> emissions, accounting for 39 percent of our total carbon footprint.

Decarbonized materials reduce emissions in two ways: they emit less CO<sub>2</sub> and require less heat than conventional materials.

- Basic elements (Ca, Si, Fe, Al, S) enable the supply of the essential minerals required for clinker chemistry and safeguard natural resources in quarries.
- Recycled construction demolition materials (CDM) yield cement paste that has already been decarbonated, meaning process-related carbon emissions are lower.
- Historical waste from other industries, including fly ash and steel slag, can replace virgin limestone and avoid landfill.

We are working with innovative companies to keep raising standards and develop new alternative material streams.

**“Ste. Genevieve underscores Holcim’s commitment to the U.S. Department of Energy’s Better Climate Challenge, to reduce net CO<sub>2</sub> emissions in the U.S. by at least 25 percent by 2033.”**

### TOUFIC TABBARA

Region Head North America



Ste. Genevieve is North America’s largest cement-producing facility

## DECARBONIZING CEMENT IN NORTH AMERICA

We are investing USD 100 million to expand our Ste. Genevieve cement plant in Missouri, U.S., and increase finished cement production capacity by over 600,000 tons to meet strong industry demand.

The project will enhance processing and allow cement production capacity to increase while reducing net CO<sub>2</sub> emissions by more than 400,000 tons per year.

Work is due to be finished in late 2025, and the capital investment will increase circularity and accelerate decarbonization across the built environment.

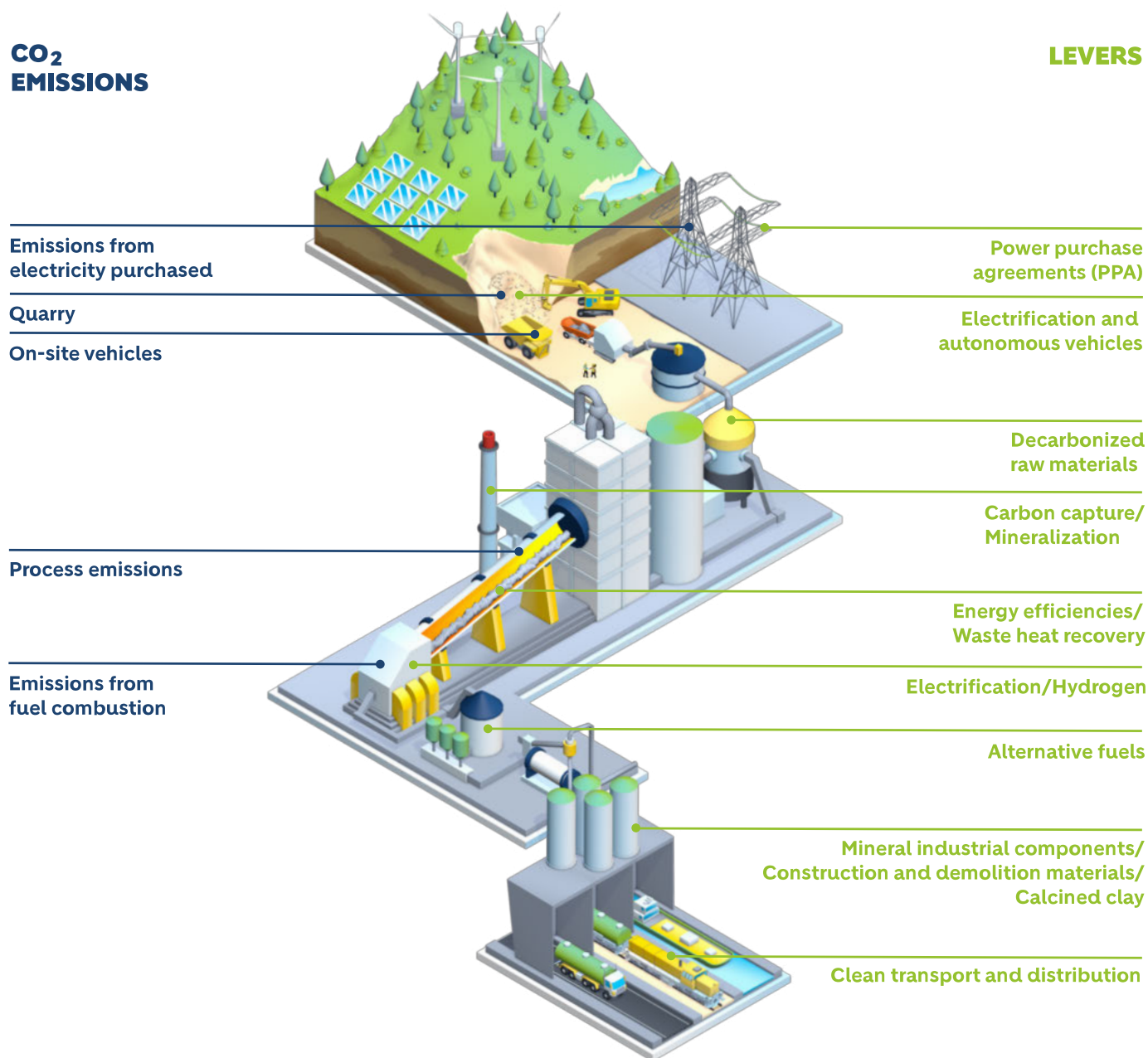
This action further underscores Holcim’s commitment to the U.S. Department of Energy’s (DOE) Better Climate Challenge to reduce net CO<sub>2</sub> emissions in the U.S. by at least 25 percent by 2033. The Better Climate Challenge is intended to drive real-world action that reduces carbon emissions and saves energy.

# HOW WE ARE DECARBONIZING HOLCIM

From our products to our process

## CO<sub>2</sub> EMISSIONS

## LEVERS



	Base Year <b>2018</b>	<b>2023</b>	Target <b>2025</b>	Target <b>2030</b>	Target <b>2050</b>
<b>SCOPE 1</b> KG CO <sub>2</sub> , net/T cementitious	<b>590</b>	<b>545</b>	<b>520</b>	<b>420</b>	
<b>SCOPE 2</b> KG CO <sub>2</sub> /T cementitious	<b>46</b>	<b>36</b>	<b>—</b>	<b>16</b>	



## CLIMATE LEADERSHIP CONTINUED

### Mineral components to reduce clinker factor

Our Scope 1 emissions pathway aims to reduce both the level of CO<sub>2</sub> in clinker and the clinker factor of our cement. We aim to decrease our clinker content from 72 percent currently to below 68 percent by 2030 and reduce it further by 2050.

Beyond recycling clinker, replacing it in our final cement products with mineral components significantly reduces the carbon intensity of the cement product.

At Holcim, we use four major categories of mineral components to reduce emissions from our cement and concrete mixes:

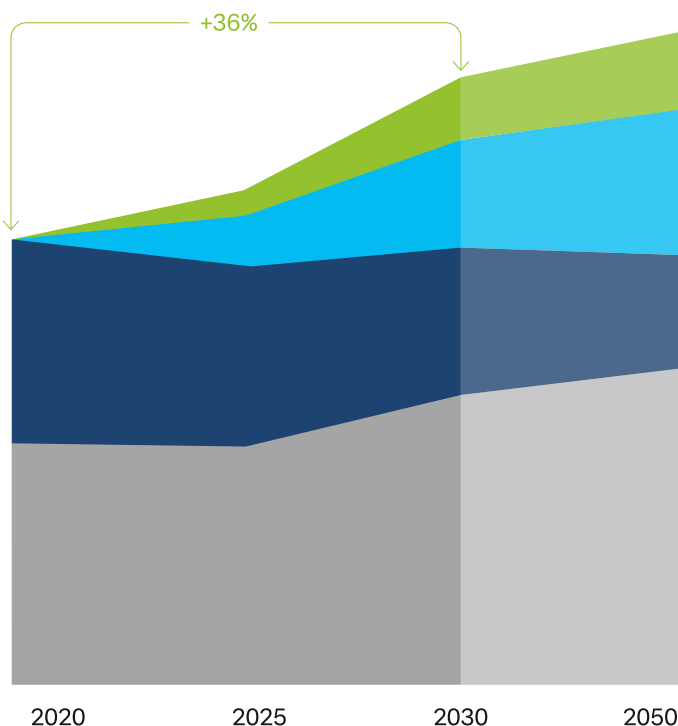
- Recycled cement paste from construction demolition materials (CDM)
- Innovative mineral components like calcined clay, pozzolana and reclaimed ashes
- Waste from other industries, including slag and fly ash, to replace virgin limestone and avoid landfill
- Traditional mineral components like limestone and gypsum

In the coming decades, we expect CDM and innovative mineral components to gradually replace slag and fly ash.

To this end, we are investing in advanced crushing and processing technology to fully recycle CDM. Our most advanced ECOCycle® circular solution in Europe can reduce the CO<sub>2</sub> footprint of cement by up to 40 percent based on recycling cement paste from CDM.

We are also scaling up the use of innovative mineral components like calcined clay that can reduce the footprint of cement by up to 50 percent, with operations currently advancing in Europe and Latin America.

### MINERAL COMPONENTS IN EUROPE (M TONS)



### GROWTH ENABLERS

#### Construction demolition materials

Recycling fines as cementitious material in low-carbon cement.

#### Innovative mineral components

Calcined clay, pozzolana, reclaimed ashes will gain in significance as a component of cement in the future.

#### Slag and fly ash

After 2025, the supply of slag and fly ash is expected to decrease due to lower production of underlying related materials (steel/coal). Lower volumes on the market will mean a cost increase.

#### Traditional mineral components

Limestones and gypsum (mainly) are and will continue to be a significant share of mineral components due to high availability and lower cost versus clinker.



We are scaling up calcined clay cement production across our regions

### Replacing limestone-based clinker

Calcined clay is a mineral powder obtained through the calcination of natural clays at a relatively low temperature. It acts as a replacement for limestone-based clinker in the final cement, allowing us to produce cement with up to 50 percent less CO<sub>2</sub> than standard cement. Globally, clay is one of the most abundant natural resources, and is therefore a highly scalable solution to produce low-carbon building materials.

At Holcim, we are increasing use of calcined clay in our formulations. Our plant in Macuspana, Mexico, was the first Holcim site in Latin America to produce cement with calcined clay. This formulation reduces the clinker factor by up to 55 percent and enables the plant to deliver ECOPlanet low-carbon cement with an up to 50 percent lower CO<sub>2</sub> footprint versus ordinary cement (CEM I).

Our plants in Apaxco and Tecomán in Mexico now use calcined clay too, with the same planned for our Malagueño plant in Argentina in 2024.

### Scaling calcined clay across Europe

As part of our European roadmap to decarbonize construction, we launched Europe's first calcined clay low-carbon cement operation at our Saint-Pierre-la-Cour plant in France in 2023.

The plant aims to deliver ECOPlanet low-carbon cement with an up to 50 percent lower CO<sub>2</sub> footprint compared to ordinary cement (CEM I). This advanced production line, a world first, runs on our 'proxima Tech' proprietary technology, and will produce both clinker and calcined clay, to deliver up to 500,000 tons of low-carbon cement per year.

Operations onsite are powered using 100 percent alternative fuels coupled with waste-heat recovery systems.

The project received financial support from the French government as part of the "France Relance" plan to invest in large-scale decarbonization and energy efficiency projects.

Opening the first calcined clay cement production line in Europe is a milestone to decarbonize building. We aim to scale up our calcined clay cements in Austria, Bulgaria, Czech Republic, Germany, Romania, Spain and Switzerland.

More broadly, we will continue to advance our ECOPlanet range of low-carbon cements across all regions by 2025.

# 50%

Potential CO<sub>2</sub> reduction using calcined clay

# 72%

Clinker factor in 2023  
(73% in 2022)

# 10.2%

Alternative raw materials in cement  
(9.3% in 2022)

# CLIMATE DECARBONIZING OUR ENERGY MIX

At Holcim, we are shifting to alternative energy across our value chain from alternative fuels and renewable electricity to waste-heat recovery systems.

## Optimizing our energy use

We are investing to modernize our kilns and lower our CO<sub>2</sub> emissions. For example, at our plant in Obourg, Belgium, we are installing an innovative oxyfuel cement kiln that significantly reduces CO<sub>2</sub> emissions. In combination with CCUS (see page 28), this will allow the plant to produce fully decarbonized cement from 2028.

Additionally, as part of Holcim's Plants of Tomorrow initiative, we are taking further steps to modernize our plants. Using digital solutions, we are creating connected, smart and energy-efficient sites that will complement our other decarbonization levers.

## Using alternative fuels

The International Energy Agency anticipates that fossil fuel consumption will peak by 2030. At Holcim, the transition to alternative fuels involves substituting traditional fossil fuels used in cement kilns, which include coal, petcoke and natural gas.

With waste volumes increasing globally, our Geocycle business (see page 18), offers us a safe and ecological solution in line with international standards. Taking a circular approach, we are reducing the carbon intensity of our cement by using pre-treated non-recyclable and biomass waste fuels in place of fossil fuels.

Waste sources include biomass, sewage sludge, shredded waste, fluff, solvents, waste oils and tires, all of which can be used to generate energy.



Near-infrared spectroscopy enables maximizing the use of alternative fuels and therefore the reduction of CO<sub>2</sub> emissions at our 'Plants of Tomorrow'

## Increasing biomass content

Our focus is on innovation to further reduce carbon emissions by increasing the biomass content in the fuels we use. To optimize alternative fuel use, we deploy near-infrared spectroscopy technology to analyze alternative fuel properties during kiln feeding. This enables us to eliminate quality variations and use an optimal fuel mix and reduce CO<sub>2</sub> emissions.

**“In Europe, our plants aim to operate with 90 percent alternative fuels by 2030. Today, 11 sites already run with over 80 percent.”**

**MILJAN GUTOVIC**

Region Head Europe and CEO Designate





We are decarbonizing our energy mix using Geocycle alternative fuels

In 2023, 30.1 percent of Holcim's thermal energy demand for clinker production came from alternative fuels. By investing in co-processing facilities and process improvements, we aim to increase this thermal substitution rate to 50 percent by 2030 and over 70 percent by 2050.

Currently, 11 of our facilities in Europe already run on more than 80 percent of their energy from alternative fuels, offering a high-yield source of energy for heat production.

In addition, as we progress toward net zero, advanced technologies like electrification and use of hydrogen as an alternative fuel will account for an increased share of our decarbonization efforts.

#### Leveraging waste-heat recovery

Waste-heat recovery ultimately serves to capture excess heat generated within a facility and repurpose it in various applications to optimize energy efficiency. Holcim's waste-heat recovery systems are specifically engineered to use excess heat produced by our cement kilns and convert it into electricity.

We presently have eight operational waste-heat recovery units, producing 318 gigawatt hours of zero-carbon electricity. This translates to a carbon reduction of 165,000 tons annually. Our goal is to triple the number of waste-heat recovery units by 2030.

# 30.1%

Of our thermal energy sourced from alternative sources

# 11

Plants in Europe running on over 80% alternative fuels

# >3M

Tons of alternative fuels processed in Europe in 2023

## CLIMATE LEADERSHIP CONTINUED

### Driving profitable decarbonization and circularity

Our Geocycle business transforms waste into resources to support our sustainability ambition. Geocycle maximizes resource value: recycling when possible, while valorizing non-recyclable materials.

Geocycle materials reduce our carbon footprint, enhance circularity and preserve natural resources. Our global network of advanced pre-treatment platforms provides scientifically proven and environmentally friendly solutions in countries with Holcim cement operations. Geocycle sets and promotes industry-leading standards and provides sustainable resources management solutions to multinationals and municipalities worldwide.

In 2023, Geocycle supported Holcim's decarbonization and circularity targets by recycling 13.9 million tons of waste and byproducts for use as decarbonized energy or in raw materials.

**“We wanted to combine the ecological leadership, culture, and way of life on Galapagos, with the mission of turning Santa Cruz Island waste-free.”**

**LUIS RIVAS**

Head of Geocycle at Holcim Ecuador



## ADVANCING A RECYCLING CULTURE IN THE “ENCHANTED ISLANDS”

Known as the “Enchanted Islands”, the Galapagos archipelago is home to many unique species and is a UNESCO Natural World Heritage Site.

For years, proper waste management was one of the greatest concerns for residents and the authorities. To solve this issue and preserve the precious natural state of the islands, Holcim and Geocycle Ecuador are working to enable a waste recovery revolution on Santa Cruz Island.

Together with the island's residents, we have recovered 59 percent of waste since 2022, and processed 50 tons of non-recyclable waste into alternative fuels to power our plants in Ecuador.

A team of journalists recently traveled to Santa Cruz to learn first-hand how residents are embracing this recycling culture to preserve the island's beauty and ensure that biodiversity continues to thrive.

Watch their documentary film using the link below.

[Watch video online here](#)



**59%**

Recovery of waste on Santa Cruz

**50**

Tons of non-recyclable waste transformed into resources each year





New solar arrays at our ready-mix concrete plant at Fort Totten, Washington, D.C. (U.S.)

### Shifting to renewable electricity

Electricity makes up a significant portion of our energy use. To decarbonize electricity, we are shifting to renewable energy sources like solar, hydro and wind power wherever possible.

Several factors impact the electricity value chain, including availability of renewable power, transport and grid infrastructure, and geographic conditions. At Holcim, we take a tailored, local approach to decarbonize our electricity use. Working with private companies and local officials, our diverse energy portfolio gives us the capability to decarbonize electricity at scale.

### Scaling up renewable electricity

We signed our largest green energy contract to date in 2023 to power our operations in Germany with wind energy. Our plants in Colombia are setting an example by operating with 100 percent renewable energy. Globally, we aim to reduce the carbon intensity of Scope 2 emissions by 65 percent by 2030, against a 2018 baseline.

Where renewable electricity sources are not readily available, we install energy facilities on our own sites.

## Generating solar energy in the U.S.

By installing new solar arrays at our ready-mix concrete plant at Fort Totten, Washington D.C., we have reduced our dependency on fossil fuels. The silo rooftop solar modules and a separate carport with solar modules aims to generate 1,300 to 1,500 megawatt hours per year of renewable energy – to cover around 90 percent of site operations.

### Harnessing solar power

We continue to make progress in rolling out solar power across our operations in Europe and the Americas:

- In Belgium, we plan to operate our first floating photovoltaic installation from 2024. It aims to supply 15 percent of our Obourg plant's electricity.
- In the U.S., we generate 10 megawatts of solar energy at our Hagerstown plant in Maryland, reducing CO<sub>2</sub> emissions by over 12,000 tons.
- In Nicaragua, at our Nagarote plant, up to 35 percent of electricity to power operations will be sourced from a new solar park we are building.





## Building with blades

Holcim is a proud member of the consortium that launched the EU-funded BLADES2BUILD project. The innovative project aims to transform used wind turbine blades into circular construction materials, enabled by our ECOCycle® technology platform.

Our collaboration with other partners on this project helps to further our commitment to building new from the old, promoting a circular economy.



Funded by  
the European Union

## Generating our own renewable energy

Through collaboration with our partners in the wind energy sector, we are installing and operating wind farms on our sites to generate our own renewable energy. For example, three wind turbines at our plant in Paulding, U.S., provide around 20 percent of the site's electricity, reducing CO<sub>2</sub> emissions by 9,000 tons per year.

## Winds of change in Germany

Our plants in Germany are at the forefront of harnessing wind energy to power our operations.

Thanks to their advantageous geographical positions, our Lägerdorf (Schleswig-Holstein) and Höver (Lower Saxony) plants met 80 percent and 52 percent of their electricity needs respectively through onshore wind power in 2023.

In total, Holcim's operations in Germany procured 59 percent of electricity for cement production from green sources, a 15 percent increase compared to 2022. Wind power contributed to a 100 percent share of this and saved 86,000 tons of CO<sub>2</sub> emissions in 2023.

### Leveraging renewable power purchase agreements

We are growing our renewable energy portfolio through partnerships with power producers. Power purchase agreements (PPAs) are long-term contracts for electricity supply between Holcim, as a corporate buyer, and renewable power suppliers. They typically specify pricing, electricity quantities and renewable sources.

In 2023, we signed our largest green energy contract to date with Iberdrola, a global leader in renewable energy. Iberdrola will supply 250 gigawatt hours of wind energy per year to power our operations in Germany. We also signed a memorandum of understanding to investigate the possibility of more clean energy projects across Europe. This includes evaluating Holcim plants to identify opportunities to install renewable energy facilities onsite – from solar to green hydrogen.

We are rolling out renewable energy PPAs around the world:

- In Europe, we secured additional long-term power supply from renewable sources in Poland, Spain and Belgium. We also signed agreements to offtake renewable power from new solar facilities in Romania and the Czech Republic.
- In North America, Holcim signed two new PPAs to supply solar power and services for our plants in Portland and Alpena and a new virtual power purchase agreement for our Exshaw plant in Canada.
- In Latin America, we secured additional power supply from renewable sources in Argentina and finalized a number of rooftop solar projects in Mexico.

### Supporting the energy transition

In addition to using renewable energies and alternative fuels to sustain our own operations, we have a responsibility to facilitate essential infrastructure for the wider energy transition.

Renewable energy adoption is rapidly expanding, with the International Energy Agency estimating that there was an extra 500 gigawatts of renewable generation capacity in 2023. Our low-carbon building solutions offer dependable, cost-efficient and high-performance infrastructure for all solutions – from dams to wind farms.

In 2023, Sabowind, a full-service wind energy provider, initiated operations at a new wind farm in Markowice, Poland. This project used 4,200m<sup>3</sup> of ECOPact concrete, leading to a 31 percent reduction in emissions during construction. The wind farm will generate 300 gigawatt hours (GWh) of electricity annually, serve approximately 75,000 homes and mitigate 100,000 tons of CO<sub>2</sub> emissions.

**“By providing low-carbon construction materials for renewable energy infrastructure, like windmills, we are helping to accelerate the energy transition.”**

**NOLLAIG FORREST**

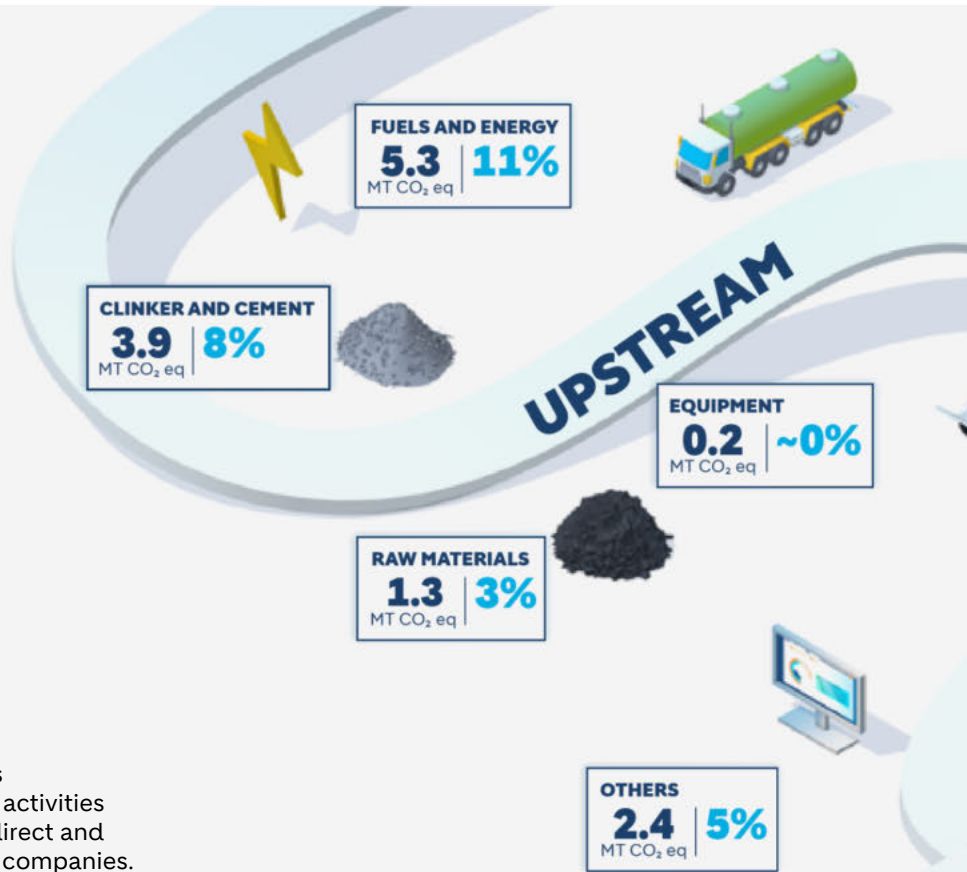
Chief Sustainability Officer

# 250GWh

Amount of renewable energy to power our operations in Germany each year from 2023

## HOLCIM'S VALUE CHAIN: SCOPE 3 EMISSIONS

**24.0**  
MT CO<sub>2</sub> eq



Scope 3 emissions are all indirect emissions associated with upstream and downstream activities of consolidated companies, as well as the direct and indirect emissions of our non-consolidated companies.

Our Scope 3 accounting gives us a basis to mobilize our full organization, driving purchasing decisions to deliver on our decarbonization commitments. It also helps us engage other companies across the value chain in building a net-zero future.

### Fuels and energy

“Cradle-to-gate” emissions from purchased fuels and energy account for 11 percent of our total Scope 3 emissions. To reduce emissions in this category, we are replacing traditional fossil fuels with locally sourced, alternative and non-extractive fuels.

### Downstream transportation

The CO<sub>2</sub> emissions from transporting our materials to customers, between factories and distribution terminals, account for 11 percent of our total Scope 3 emissions. We are reducing these by optimizing routes and loads, moving volumes from road to waterways or rail, and deploying fleets powered by electricity and more eco-friendly fuels.

### Purchased clinker and cement

Purchased clinker and cement account for eight percent of our total Scope 3 emissions. We are introducing a requirement that our clinker and cement suppliers provide the CO<sub>2</sub> information related to their products, for example, through Environmental Product Declarations (EPDs), to accelerate the purchase of low-carbon products.

### Investments and joint ventures

We account for Scope 1 and 2 emissions from our principal cement-producing joint ventures in proportion to our effective participation. These include:

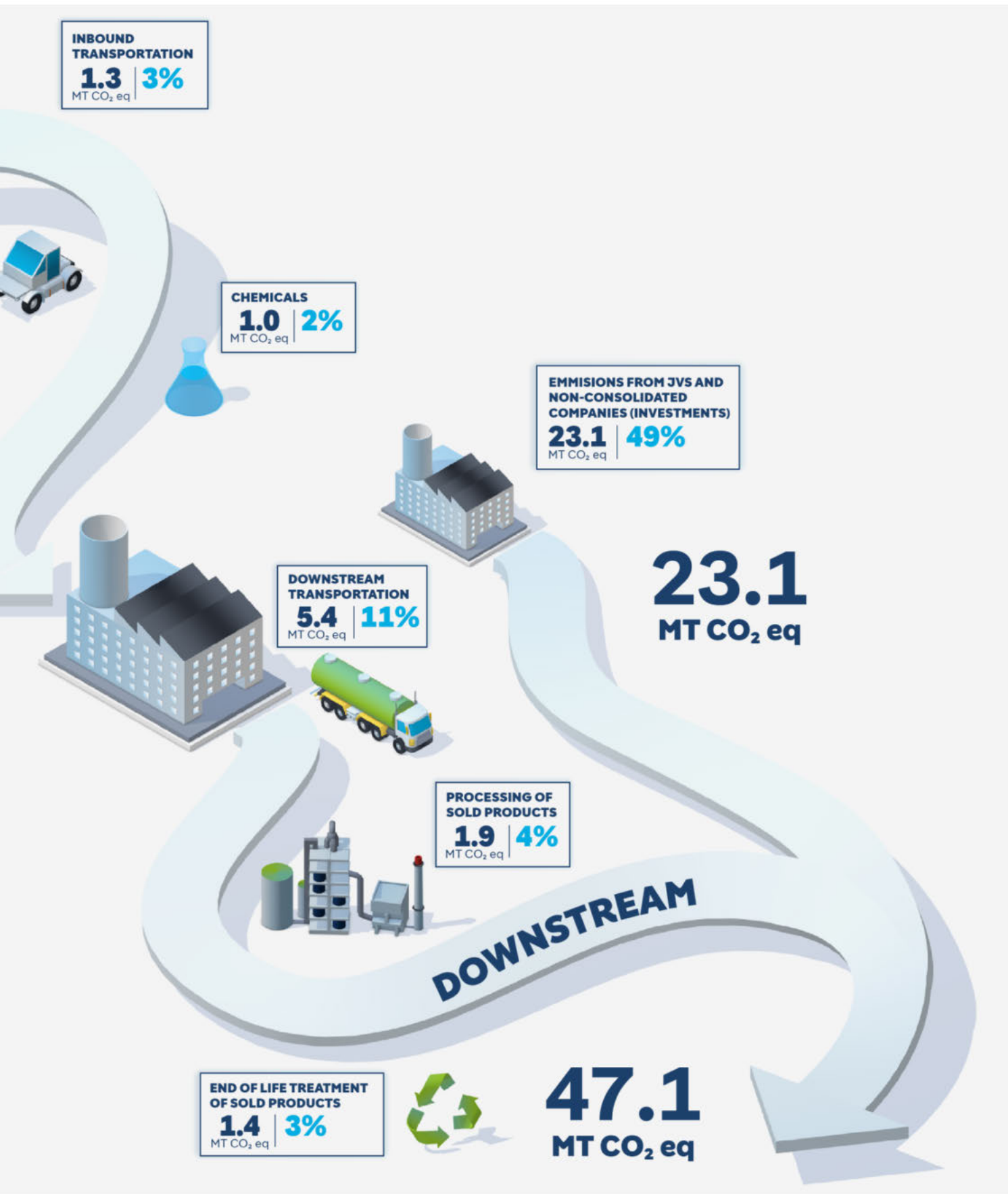
Company	Country of incorporation or residence	Effective participation (percentage of interest)
Cement Australia Holdings Pty Ltd	Australia	50.0%
Huaxin Cement Co. Ltd.	China	41.8%
Lafarge Maroc S.A.S.	Morocco	50.0%
Readymix Qatar L.L.C	Qatar	49.0%

### Other products and services purchased

All other products and services purchased account for approximately 21 percent of our total Scope 3 emissions. We expect reductions from including CO<sub>2</sub> requirements in the tendering process and integrating CO<sub>2</sub> as a parameter in the “Total Cost of Ownership” models used to drive purchasing decisions.

We also expect CO<sub>2</sub> reductions from innovation and partnerships with suppliers of global categories.





## CLIMATE

# DECARBONIZING OUR MOBILITY

We are transitioning to low-carbon mobility from quarry to city by adopting more sustainable and efficient transport options, using low-emissions trucks as well as rail and waterways.

Downstream transportation currently accounts for 11 percent of our total Scope 3 carbon emissions. To reduce these emissions, we are leveraging four pillars:

- Transitioning to low-emission trucks
- Using rail and waterways where possible
- Optimizing vehicle dispatch, including the use of lightweight trailers
- Encouraging eco-driving: adjusting driving behaviors to reduce fuel consumption

By implementing these measures, and encouraging our customers and suppliers to do the same, we aim to reduce our Scope 3 downstream transportation emissions, per ton of material transported, by 24.3 percent by 2030 compared to 2020.

### Decarbonizing our vehicle fleet

We are deploying electric fleets where possible across our operations: from autonomous electric vehicles in quarries, to heavy-duty electric trucks to distribute materials. Our goal is to reach 30 percent of zero-emission heavy-duty truck purchases or contracts by 2030.

We use a range of electric mobility options across aggregates, ready-mix and cement in Europe, North America and Latin America. In Europe, Colombia and Mexico, we are piloting electric ready-mix concrete trucks that can reduce carbon emissions by 60–80 percent “well-to-wheel” compared to conventional models.

### Digitalizing to optimize logistics

We are pushing the boundaries of digitalization across our business, starting with transport and logistics. The Transport Analytics Center (TAC) is our proprietary digital technology platform that optimizes load and route efficiency, safety and carbon footprint. It delivers state-of-the-art logistics and record performance with demonstrated sustainability results. TAC is active across 51 countries worldwide. In 2023, it covered 1.23 billion kilometers, with tracking systems in more than 47,000 trucks.



### Collaborating to drive industry forward

In 2023, we joined the Smart Freight Centre, a global non-profit organization founded to make the global freight sector more efficient and environmentally sustainable. We are the first construction and building materials company to become a member of the platform under the Global Logistics Emissions Council (GLEC). In collaboration with other industry leaders, we will share best practices and insights into sustainable logistics strategies and work to promote the adoption of low-carbon freight solutions.

### Creating demand for emerging clean technologies

Holcim is a founding member of the First Movers Coalition, established in November 2021 at COP26 in Glasgow. This initiative brings together like-minded companies that share a net-zero ambition to use their procurement standards and practices to shift the system towards green solutions. By placing orders for emerging low-carbon technologies, coalition members build the demand needed by suppliers to invest in scaling-up production of new and innovative green technology.

## HOLCIM AND VOLVO: ELECTRIC FIRST MOVERS

In May 2023, Holcim announced an agreement with Volvo to deploy up to 1,000 electric trucks by 2030 – Volvo’s largest commercial order for these vehicles. Replacing diesel trucks with electric ones will reduce our CO<sub>2</sub> emissions from road transport by up to 50 percent, and delivery of the first trucks began at the end of 2023.

The agreement is part of a wider partnership between the two companies to deploy electric trucks across Holcim’s European operations from now to 2030.

Holcim and Volvo are both founding members of the First Movers Coalition, a group of companies leveraging their purchasing power to create early markets for innovative clean technologies.

Through such partnerships, companies like ours are leading the shift to sustainable solutions and accelerating green innovation and supply.

# 12.5%

**Reduction in our Scope 3 emissions  
from downstream transportation**  
(compared to 2022)

**“Partnership is the new leadership. I am very proud of the partnership we have developed with Holcim, and the results we are achieving together to make big CO<sub>2</sub> reductions.”**

**MARTIN LUNDSTEDT**

President and CEO of Volvo Group



### Next-generation autonomous electric haulers

Holcim Switzerland is collaborating with Volvo Autonomous Solutions to jointly test and further develop the use of autonomous electric haulers in its operations. Testing is being carried out at Holcim’s Siggenthal quarry in Switzerland, with the vehicles already proving quieter, more sustainable and safer than conventional haulers. When operating at full scale, autonomous electric haulers can reduce quarry CO<sub>2</sub> emissions by up to 85 percent.



Jan Jenisch, Chairman and CEO of Holcim, with Martin Lundstedt, President and CEO of Volvo Group, in front of one of our electric trucks



## CLIMATE

# DRIVING ADVANCED TECHNOLOGIES

We are focusing on advanced technologies as we progress towards net zero, innovating in electrification, hydrogen and carbon capture, utilization and storage (CCUS).

### Clean electricity to reduce fossil fuel use

We are exploring the electrification of our processes to decrease our dependency on fossil fuels by substituting them for clean electricity. Complete process electrification could also be part of our carbon capture solution for net-zero cement plants.

While we are examining and testing new technologies to bolster our electrification portfolio, we are also collaborating with global leaders in electricity production to secure clean electricity supply for our projects.

### Exploring the potential of hydrogen

Hydrogen is increasingly being explored as an alternative fuel to accelerate the energy transition. At Holcim, we are advancing research and development into the application of hydrogen to help decarbonize the building sector.

Low-carbon hydrogen produced using clean energy has the potential to be an alternative to the fossil fuels powering our transportation and cement kilns. It also enables us to increase the amount of alternative fuels we use, particularly biogenic fuels, which often have lower calorific value or are harder to ignite.

Equally, hydrogen has a role to play in our CCUS strategy. Clean hydrogen can be reacted with captured CO<sub>2</sub> to produce low-carbon fuels or chemicals and plastics.

[→ Read more about CCUS on pages 28–33](#)



Our Carbon2Business CCUS project in Lägerdorf, Germany will transform cement into a net-zero building material



Holcim is exploring the use of green hydrogen as an alternative to fossil fuels at our plant in La Malle, France

## TRIALING HYDROGEN AS AN ALTERNATIVE FUEL

In 2023, we conducted a milestone hydrogen test at our plant in La Malle, France. The aim of the test was to replace the fossil fuel used to power the cement kiln with hydrogen – a process called fuel switching. At La Malle, we trialed a hydrogen-injection rate of more than 50 percent, with the remaining fuel coming from biogenic sources.

We also tested hydrogen in a process called “boosting”, which involves feeding a small amount of hydrogen (around one percent of total feedstock) into the kiln. This small amount of hydrogen acts as a catalyst to optimize the combustion process and increase the use of alternative and biogenic fuels.



CLIMATE

# ADVANCING CARBON CAPTURE, UTILIZATION AND STORAGE TECHNOLOGY

Harnessing advanced technologies such as carbon capture, utilization and storage (CCUS) is a game-changer to meet long-term climate goals. Our advanced CCUS roadmap positions us as the right partner to scale up net-zero cement around the world.

### Decarbonizing cement production

Decarbonizing cement and concrete is at the core of Holcim's decarbonization journey. To achieve our goal, the first step is to decarbonize our formulations and energy mix (see page 12).

We are decarbonizing our product formulation with low-emission raw materials from calcined clay to construction demolition materials (CDM). At the same time, we are decarbonizing our energy mix using Geocycle alternative fuels, such as biomass, and using renewable electricity generated by wind and solar.

For the remaining CO<sub>2</sub> emissions, we are advancing CCUS technologies to become net-zero.

Using CCUS technologies, we can capture CO<sub>2</sub> emissions before they are released into the atmosphere. The captured CO<sub>2</sub> can then be used in various applications, such as the production of low-carbon fuels or materials. Alternatively, we can store it safely underground in deep geological formations.

CCUS enables us to reduce greenhouse gas emissions from our operations, offering a viable pathway toward global climate goals and the transition to a net-zero economy.

### Carbon capture technologies

We are developing and assessing several mature carbon capture technologies for cement production to offer us maximum flexibility across our global footprint. They fall into two categories:

#### Post-combustion technologies

These solutions capture CO<sub>2</sub> in the exhaust gas of a traditional kiln system. The most advanced use solvents to absorb CO<sub>2</sub>, creating a liquid that is sent to a regenerator where concentrated CO<sub>2</sub> can be released. Other post-combustion approaches include CO<sub>2</sub> separation by membranes and adsorption processes.

#### Integrated processes

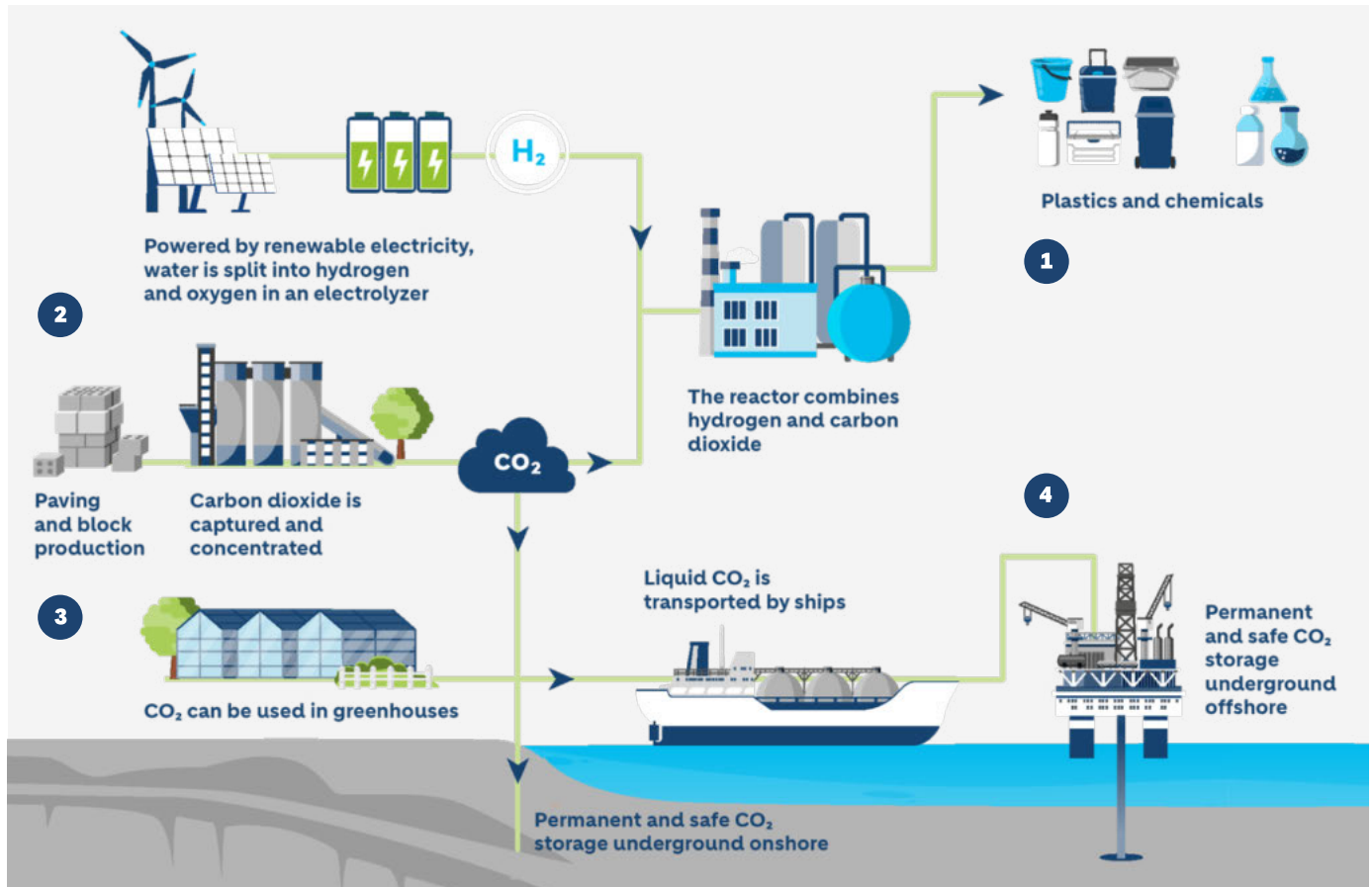
We are also exploring various integrated processes such as oxyfuel, the electrification of clinker manufacturing and the calcination of raw materials. The oxyfuel approach replaces air with oxygen in cement manufacturing, avoiding nitrogen in the system and creating a concentrated CO<sub>2</sub> exhaust stream.





## HOLCIM'S CCUS PATHWAYS

Our projects span four CCUS pathways.



### 1 CONVERSION UTILIZATION

CO<sub>2</sub> can be repurposed by reaction with green hydrogen to produce fuels that can decarbonize the aviation and maritime sectors, or can be used to produce chemicals and plastics.

### 2 MINERALIZATION

CO<sub>2</sub> is reacted with minerals to form carbonates, storing the CO<sub>2</sub>. In the cement sector, this reaction provides a way of capturing CO<sub>2</sub> as a raw material to produce new building materials.

### 3 MARKET UTILIZATION

Captured CO<sub>2</sub> can be used for greenhouse plants as a crop growth enhancer or in the food and beverage industries, to carbonate soft drinks, for example.

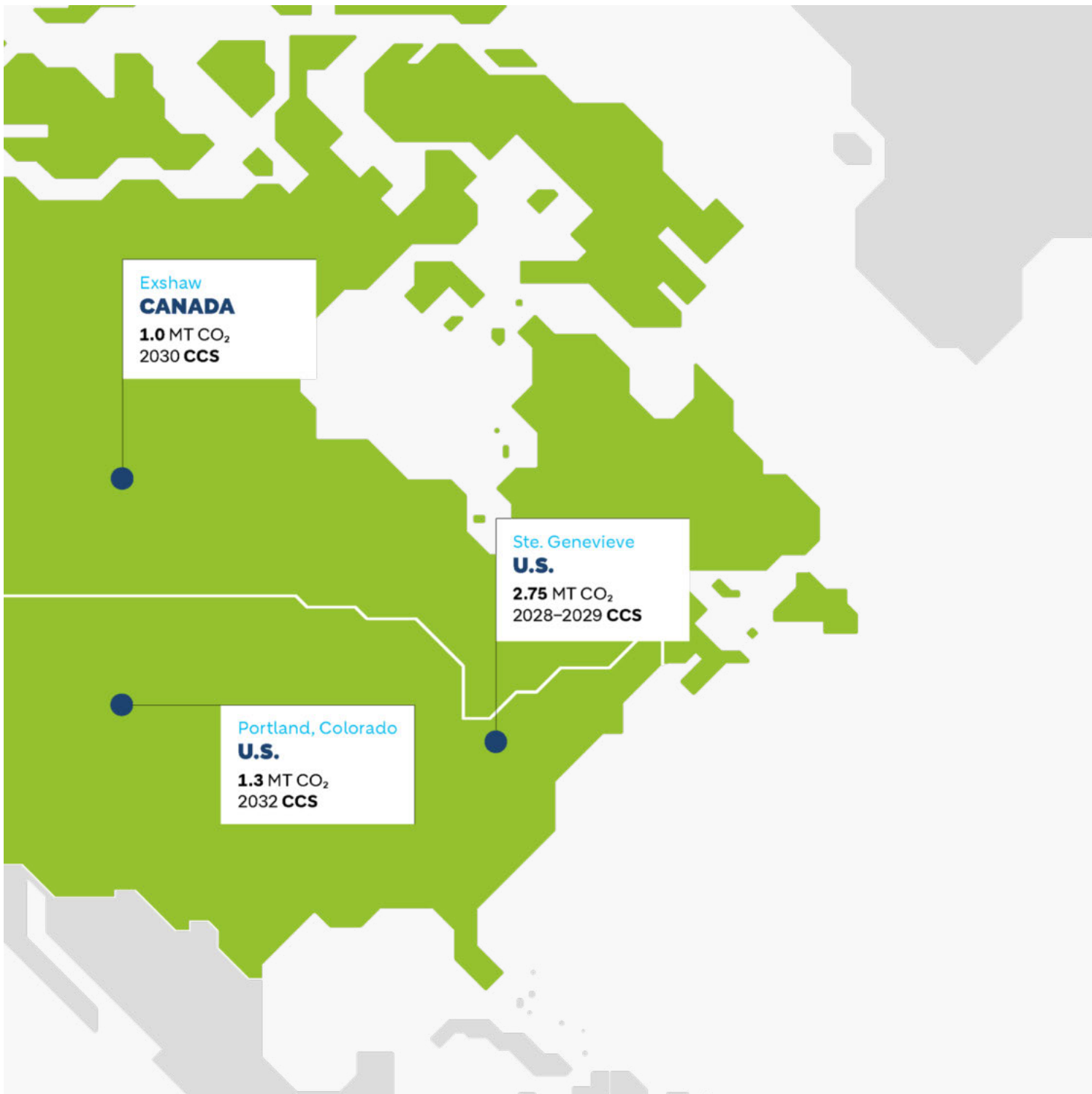
### 4 STORAGE

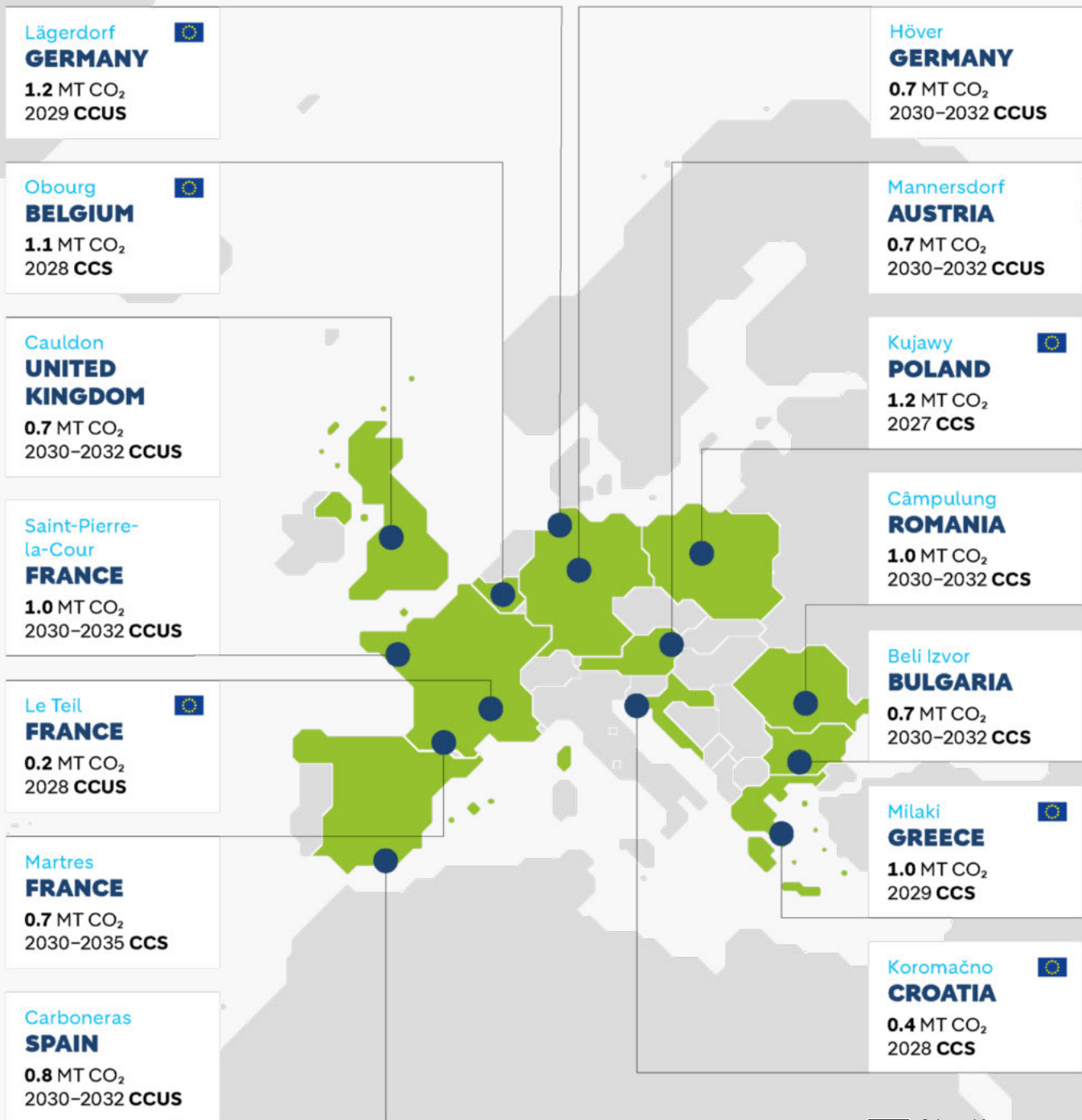
CO<sub>2</sub> is captured from a facility and transported to a location via pipelines, trains, ships or trucks. It is then safely stored underground either onshore or offshore, in abandoned oil and gas reservoirs or dedicated saline aquifers.


## OUR AMBITIOUS CCUS ROADMAP

By 2030, we aim to reach significant milestones in our CCUS journey. We have committed to invest CHF 2 billion into CCUS projects, net of public funding, to capture five million tons of CO<sub>2</sub> annually and produce eight million tons of fully decarbonized cement each year.

To meet these targets, we have identified 17 flagship projects, based on mature technologies and robust partnerships and value chains. Each one is well positioned to become a net-zero cement plant. Six full-scale CCUS projects across Europe have been selected for grants from the European Union (EU) Innovation Fund and aim to go live before 2030.





 Selected for grants from the European Union (EU) Innovation Fund



## CLIMATE LEADERSHIP CONTINUED

### Robust partnerships and value chains

Close collaboration among public authorities, private companies, local stakeholders and other value chain partners is essential to secure the development of technologies that will unlock the business case for CCUS and enable a net-zero future.

Several factors impact the value chain including available CO<sub>2</sub> infrastructure, proximity to ports, renewable power and water supply, nearby chemical or plastics industries and the feasibility of on- or offshore CO<sub>2</sub> storage.

At Holcim, we are leveraging proven technologies and tailoring pathways and value chains based on local conditions. Working with other private companies and startups, we have a portfolio of diverse and cost-effective solutions that we scale up across the company.

**“CCUS is a game-changer on our journey to net zero. Holcim has the broadest range of projects and technologies to make net-zero cement a reality at scale. By 2030, we aim to offer eight million tons of fully decarbonized cement each year.”**

**MILJAN GUTOVIC**

Region Head Europe and  
Chief Executive Officer Designate

## Addressing potential impacts of CCUS

Carbon capture and storage will play a key role in Holcim's journey towards net zero. As such, Holcim is at the forefront of the development of these technologies with the broadest range of projects within the industry.

Holcim is thoroughly assessing the potential impacts of these technologies on the environment or the communities where we operate throughout the full value chain:

- Energy and water consumption of CCUS installations
- Potential impacts on communities in regards to onshore storage solutions
- Impact on Holcim's Scope 3 emissions

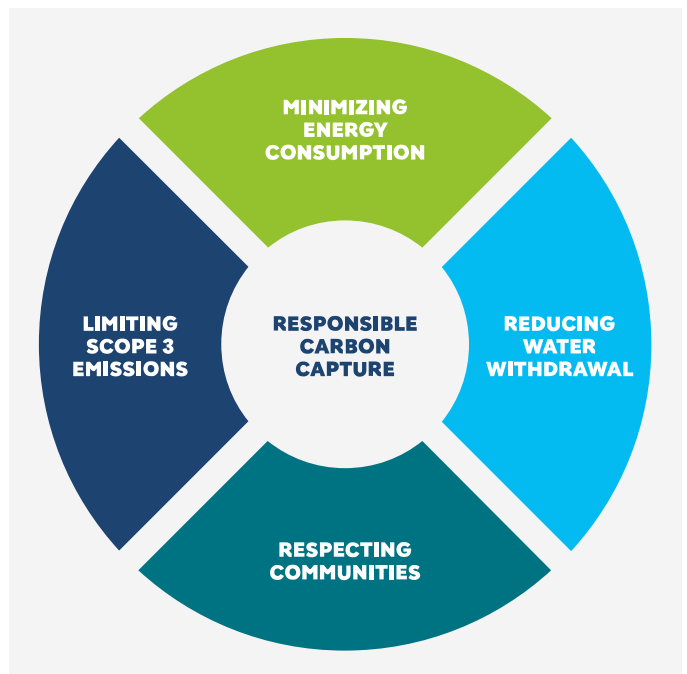
→ Read about our climate and nature risks and opportunities on page 64

# 5M

Tons of CO<sub>2</sub> captured annually by  
2030 from six CCUS projects selected  
for EU Innovation Fund grants



Co-funded by the European Union  
Emissions Trading System  
Innovation Fund





Carbon2Business - Lägerdorf, Germany



GO4ECOPlanet - Kujawy, Poland

## CARBON2BUSINESS

Launched in partnership with Thyssenkrupp Industrial Solutions AG and Linde Engineering, Holcim's Carbon2Business project at our cement plant in Lägerdorf, Germany, aims to capture 1.2 million tons of CO<sub>2</sub> emissions annually.

The captured CO<sub>2</sub> can be processed into e-methanol or as a raw material for industry, to produce plastics, for example. We are developing new value chains and technologies to enable the decarbonization of industrial companies beyond the cement industry, by repurposing unavoidable emissions from the cement sector.

Holcim has concluded long-term supply contracts with green electricity providers and also operates its own wind farm. Schleswig-Holstein offers ideal site conditions for the project: there is more green electricity available than is consumed locally.

For industry to use the CO<sub>2</sub> as a raw material, a pipeline needs to be built, and is being realized with various industry partners. With a capacity of at least 1.2 million tons of CO<sub>2</sub> per year, the pipeline is designed to transport the captured and processed CO<sub>2</sub> safely and economically.

In terms of local benefits, the project aims to attract business to the region and preserve and create jobs.

# 1.2M

Tons of CO<sub>2</sub> potentially captured annually

## GO4ECOPLANET

From 2027, Kujawy cement plant in Poland will operate a unique installation that aims to capture close to 100 percent of Scope 1 CO<sub>2</sub> emissions. Holcim's GO4ECOPlanet project is large-scale, one of the most cutting-edge solutions for the construction industry in Europe.

The CO<sub>2</sub> emissions captured will be transported to CO<sub>2</sub> sequestration storage areas. The carbon capture installation is designed to remove other oxides from flue gas such as NO<sub>x</sub>, SO<sub>x</sub> and dust, producing 99.9 percent pure CO<sub>2</sub> and with positive impacts on air quality.

Fully powered by low-carbon electricity, the installation aims to eliminate more than 10 million tons of CO<sub>2</sub> over ten years along the supply chain. This includes 400 kilotons of CO<sub>2</sub> related to the transportation process, representing less than five percent of the liquid CO<sub>2</sub> captured over the same period. The plant has the potential to capture 1.2 million tons of CO<sub>2</sub> each year, representing 10 percent of annual emissions in Poland's entire cement sector. It will also contribute to pushing forward the national infrastructure and legislation development to accelerate decarbonization. To minimize its impact, the project will incorporate a closed loop water cooling system to reduce freshwater withdrawals.

An estimated 40 new jobs will be created at Holcim Polska S.A., with around 200 additional positions created in companies along the carbon capture and storage value chain.

# 1.2M

Tons of CO<sub>2</sub> potentially captured annually

# SUSTAINABLE CONSTRUCTION: BUILDING BETTER WITH LESS

At Holcim we are building better with less to decarbonize construction. We combine low-carbon building solutions with smart design to use less material, which reduces upfront carbon compared to conventional materials.

## Smart design

Buildings account for 37 percent of the world's energy-related CO<sub>2</sub> emissions today, with 10 percent generated at the construction phase and 27 percent linked to buildings in use. The construction phase, known as upfront carbon, plays a key role in decarbonizing building.

We are leveraging our strategic partnerships with leading academic institutions including the Massachusetts Institute of Technology (MIT) under the MIT Climate & Sustainability Consortium, and the Swiss Federal Institute of Technology (ETH) to develop smart design building solutions that aim to significantly reduce upfront carbon.

One of the most effective levers available to reduce upfront carbon is the concept of smart design to build better with less. When the most efficient design is

combined with the correct materials, in the right location of a structure, the result can achieve significant savings in CO<sub>2</sub>. A smart design approach in the early stage of projects can reduce mass, which reduces vertical loads, which can reduce mass further. This is known as the “virtuous circle of design improvement”, and embraces the Define, Measure, Analyze, Improve and Control model to achieve the optimal design for a specific structure.

We are embracing novel, “smart design” construction solutions, with systems that can reduce upfront carbon at scale in the built environment. Smart design, plus efficiency gains in the construction phase and concrete industrialization process, will contribute to a 26 percent reduction in our absolute Scope 1 emissions by 2050.

[→ Learn more about Holcim's pathway to net zero on page 11](#)





## PIXELFRAME

The world builds the equivalent of New York City every month, driven by rising population and urbanization. Over 40 billion tons of virgin materials are extracted from the planet every year in order to build, so making construction circular is essential to staying within our planet's boundaries while we improve living standards for all.

What if we could reuse structural elements to extend the life of buildings by dismantling and rebuilding them multiple times to serve different purposes, so that 50 years of life could become 200?

"PixelFrame" is a system we are collaborating on with Caitlin Mueller, Associate Professor of Civil and Environmental Engineering and Architecture at MIT's Civil and Environmental Department, and her team of world-class researchers. The system harnesses design and computation strategies that give the concrete building elements an optimized geometry which is strengthened through post-tensioning. The system is completely modular and designed for disassembly and reuse several times. This reduces the carbon footprint of the structural system by around 60 percent compared to a conventional reinforced concrete design.

The PixelFrame system separates the reinforcement and concrete components, allowing the Pixel segments to have a longer design and be reused multiple times. Embracing a circular construction approach allows the standardized modules to be reused in flexible configurations. Every time they can be reused reduces the need for new materials and reduces emissions in the system's second life.



## RIPPMANN FLOOR SYSTEM

In conventional multi-story buildings, floors account for around 40 percent of the total weight, which means that smartly designed systems that reduce the mass of structural floors can deliver a compounding reduction in embodied emissions.

The Rippmann Floor System® (RFS®) is a lightweight rib-stiffened funicular floor invented by the Block Research Group, led by Dr Philippe Block, Professor of Architecture and Structures at ETH Zurich, and developed by the ETH Zurich spin-off VAULTED AG. Holcim developed a special ECOPact concrete mix for the prefab solution.

The RFS can reduce up to 70 percent of concrete and 90 percent of reinforcement steel by transferring the loads to the supports predominantly through compression. This is achieved through their vaulted geometry, similar to the centuries-old principles used to build the stunning Gothic cathedral ceilings in masonry that still stand today.

More than 6,500m<sup>2</sup> of Rippmann Floor System® is now being implemented in the CreaTower I project in Zug, Switzerland, using smart design to place the right material, concrete, only where it is structurally needed in the building's floor. Combining the resulting volume reduction with the low-carbon concrete supplied by Holcim, the carbon footprint of the project is significantly reduced.



# REINVENTING CONCRETE FOR A SUSTAINABLE FUTURE

At Holcim, we are reinventing concrete to make it net-zero. Shifting from volume to value, we are making this vital urban building block low-carbon, circular, energy-efficient, nature-friendly and more.



## HIGH-STRENGTH DYNAMAX

DYNAMax, Holcim's ultimate high performance concrete, enables our customers to build better with less. One example is Seven Gardens Oak House in Wiesbaden, Germany. Recognized by the German Sustainable Building Council, the use of DYNAMax ensured high strength, outstanding durability, superior rigidity and a reduced carbon footprint by lowering material demand.

40

Gigapascal (GPa) minimum elastic modulus for rigidity



## LOW-CARBON ECOPACT

ECOPact low-carbon concrete delivers 100 percent performance with at least 30 percent lower CO<sub>2</sub> than the market standard. Making low-carbon construction happen at scale it represents 19 percent of our ready-mix sales and is a CHF 1+ billion brand.

30%

Lower CO<sub>2</sub> emissions compared to standard (CEM I) concrete



## CIRCULAR ECOCYCLE®

ECOCycle® makes concrete up to 100 percent recyclable, allowing our customers to build new from old and cities from cities. Holcim has 135 recycling centers around the world, and is driving circular construction in every metropolitan area where we operate, recycling construction demolition materials into new building solutions.

135

Recycling centers



## WATER-PERMEABLE HYDROMEDIA

Hydromedia permeable concrete allows water to flow through to recharge ground soil, enabling urban forests and gardens. By bringing more nature into cities, we can reduce the heat island effect, improve air quality and optimize water flows to contain flooding, while offering green public spaces for people to enjoy.

# 500

L/min/m<sup>2</sup> drainage rate



## SMART TECTORPRINT

TectorPrint, Holcim's proprietary 3D concrete printing ink, empowers smart design, using concrete at its best with the minimal amount of material for maximum strength. Achieving strength through geometry, from 3D printing to smart design applications like the Rippmann Floor System®, can reduce material use by up to 50 percent with no compromise in performance.

# 50%

Reduction in material use



## ENERGY-EFFICIENT CONCRETE

Thermal activation in concrete enables buildings to be passive and self-sufficient, accelerating our world's energy transition. This school in Vienna, Campus Aspern Seestadt, generates all its renewable energy onsite from geothermal heat pumps and solar panels. Its concrete slabs are essential for optimizing its energy efficiency.

# 90%

Of school's energy from geothermal energy optimized by concrete



# DRIVING CIRCULARITY

Circular construction can accelerate the decarbonization of building, by reducing, reusing and recycling materials across the lifecycle.

Striatum, the first-of-its-kind 3D-printed concrete bridge, as installed at the Venice Biennale of Architecture in 2021



**IN THIS SECTION**

- 40** Driving circularity to build new from old
- 42** Circular living
- 44** From sea to city

**CASE STUDY**

## Striatus: Circular by design

Since the composition of materials used in a building is a major factor in its lifecycle environmental impact, what if you could reduce overall material use by optimizing building size and methods, to ensure minimum material use and maximum strength?

We did precisely this with Striatus, the first-of-its-kind, award-winning 3D-printed concrete bridge that Holcim presented during the 2021 Venice Biennale of Architecture with our partners.

Striatus' digital and circular design showcases concrete at its best. The footbridge holds together solely through compression with no reinforcements, while the structure's concrete blocks are designed to be infinitely disassembled and reused, and can be easily recycled.

This footbridge set a blueprint for future building using advanced technologies from computational design to 3D concrete printing,

In 2023, we took this innovation to the next level with Phoenix (see page 41).

[Watch video online here](#)

CIRCULARITY

# DRIVING CIRCULARITY TO BUILD NEW FROM OLD

Holcim is driving circular construction in all key metropolitan areas where it operates, recycling construction demolition materials with its ECOCycle® circular technology platform to build new from old.

**Scaling up circular construction**

At Holcim, we are scaling up circular construction in all metropolitan areas where we operate. In 2023, we recycled 36.3 million tons of materials across our business, from recycling construction demolition materials (CDM) into new building solutions to converting non-recyclable plastics and minerals into new alternative materials. We also take materials at the end of their life, such as biomass and municipal waste, and turn them into alternative energy sources.

**Building new from old**

In 2023, we recycled 8.4 million tons of CDM, up 24 percent compared to 2022, and are on track to reach our target of 10 million tons by 2025. We currently operate 135 recycling centers with the ambition to raise this to 150 in Europe alone by 2030.

We launched ECOCycle®, our proprietary circular technology platform, to recycle CDM into new building solutions. Using this platform we can recycle from 10 to 100 percent of CDM across a broad range of applications, from decarbonized raw materials in low-carbon cement formulation to aggregates in concrete and fillers in road construction.



**CIRCULARITY HIGHLIGHTS 2023**

**CIRCULAR CONSTRUCTION**

8.4M

Tons of CDM recycled

**RECYCLING OF CDM**

+24%

Compared to 2022

**RECOGNIZED LEADERSHIP**



'Circularity Lighthouse' award for ECOCycle®



## PHOENIX RISES FROM STRIATUS

### Building on the innovations of Striatus

Located at Holcim's Innovation Hub in Europe, Phoenix is a first-of-its-kind 3D-printed concrete masonry bridge built with 10 tons of recycled materials.

Completed in 2023, Phoenix represents the evolution of Striatus (see page 38), using aggregates recycled from its predecessor's concrete blocks.

The stunning structure uses an optimized low-carbon formulation that has a 40 percent lower CO<sub>2</sub> footprint compared to the original Striatus, and Phoenix's overall carbon footprint is 25 percent lower.

Together with our partners, we are now exploring how Phoenix could be scaled up to provide more generalized sustainable infrastructure solutions.

### Developing a custom concrete ink

Using our proprietary ECOCycle® circular technology, we developed the custom concrete ink for Phoenix, integrating recycled construction demolition materials with a 100 percent recycled ECOPlanet cement.

Circular construction, using computational design and 3D printing, allows for a reduction of up to 50 percent of the materials used with no compromise in performance. Circular by design, Phoenix stands solely through compression without reinforcement, with blocks that can be easily disassembled and recycled.

### Partnering to drive innovation

Phoenix is a testament to the importance of advancing partnerships for a low-carbon and circular built environment.

Beyond the core collaboration with Block Research Group at ETH Zurich, Zaha Hadid Architects Computation and Design Group and incremental3D, Phoenix was created with contributions from: AMODIS, DEKRA, Groupe Noel and Bürgin Creations.

The project demonstrates Holcim's commitment to decarbonization: building better with less using low-carbon materials, smart design and 3D printing, as well as driving circular construction to build new from old, using recycled materials and preserving natural resources.

**“Phoenix is a significant milestone in technology readiness. It showcases the maturation of integrated design to construction technologies that were initiated with Striatus.”**

### SHAJAY BHOOSHAN

Head of Computation and Design Group,  
Zaha Hadid Architects



Phoenix was built at the Holcim Innovation Center in Lyon by recycling aggregates from the original blocks of Striatus

# CIRCULAR LIVING

Let's build circular cities together! Holcim is helping to empower them with sustainable buildings, renewable energy, green mobility, recycling centers and nature inside.

At today's rate of resource demand, we are set to consume 2.3 planets by 2040<sup>1</sup>. To stay within our planet's boundaries, we need to fundamentally change the way we build. That is why we are going beyond circular construction with a call for action to drive circular living.

## Empowering circular cities

With 70 percent of the world's population expected to live in cities by 2050, cities can play a vital role in helping us shift from a linear take-make-waste economy to a circular reduce-regenerate-recycle one. The Circular Cities Hub is a dynamic platform to raise global awareness and fast track the shift to circular living and building.

As part of the Circular Cities Hub, the Circular Cities Barometer measures how fast 30 global cities are transitioning from a linear to a circular economy. The Barometer gives us unique insights into what the most innovative circular cities around the world are doing.

Through solutions such as ECOPact low-carbon concrete we enable smart, sustainable buildings. We contribute to infrastructure enabling green mobility, from metros and railways to bicycle and pedestrian alleys, even roads that can charge electric vehicles.

Solutions such as Elevate roofing and insulation systems help improve buildings' energy efficiency and achieve the most advanced sustainability certifications. Malarkey has diverted millions of rubber tires and billions of plastic bags from landfill by upcycling them into roofing shingles.

We are helping to drive the transition to renewable energy too, for example with solar-enabling roofs. In partnership with General Electric, we are 3D-printing higher, more powerful wind turbines and, as part of the Blades2Build consortium, recycling the blades at the end of their service lives.

From green roofs to urban gardens enabled by Hydromedia water-permeable concrete, we are bringing more nature into cities, improving air quality, cooling urban temperatures and enhancing well-being.

Our new proprietary ECOCycle® circular technology platform can recycle from 10 percent to 100 percent of construction demolition materials across a broad range of applications, from decarbonized raw materials in low-carbon cement, through to aggregates and concrete.

**“In partnership with Bloomberg Media, Holcim scores global cities on sustainability. Because building smarter and more sustainably goes hand-in-hand with growing local economies, reducing carbon emissions and improving public health.”**

**MICHAEL R. BLOOMBERG**  
Founder, Bloomberg LP



<sup>1</sup> World Business Council for Sustainable Development





The Ellinikon, built on the site of the former Athens airport, is the largest urban regeneration project in Europe. It is using Holcim's ECOPact and Hydromedia, as well as recycling concrete from the former runways

## EUROPE'S LARGEST URBAN REGENERATION PROJECT

Holcim is providing ECOPact low-carbon concrete and Hydromedia permeable concrete for the largest urban regeneration project in Europe. The Ellinikon, located outside of Athens, Greece, will recycle the materials of the city's abandoned international airport and increase the amount of green space per resident in the metropolitan area by 44 percent.

Nearly 28,000 m<sup>2</sup> of concrete and tarmac from old runways will be reused for benches and paving. One of three airports in the world designed by renowned architect Eero Saarinen, the 1960s terminal hall will be repurposed into an event space.

Holcim's ECOPact will reduce the development's concrete carbon footprint by at least 30 percent, while Hydromedia will enable smart rainwater management. Construction is underway with the first phase of project due to be completed in 2026.

**“Environmental protection, sustainable development and the benefits for the country and its citizens are the core pillars on which The Ellinikon is being developed. Our cooperation with Holcim is another pioneering step towards the creation of a future green city.”**

**DIMITRIS KITSIOS**

Chief Infrastructure & Controls Officer  
at Lambda Development

# 6.2M

Square meters of abandoned airport regenerated

# 44%

Increase in green space in Athens metropolitan area



# “FROM SEA TO CITY!” SPREADING OUR GO CIRCULAR MESSAGE

With GO CIRCULAR, Team Holcim-PRB is sailing the world with our call to action, to accelerate circular building and living from sea to city.

The Ocean Race is one of the toughest team events in sport and one of the few global climate-positive sports events. It was a challenge that our team eagerly accepted in 2023, joining the regatta to promote circular living from sea to city and building for a net-zero future.

During the race, they gathered scientific data as part of the largest ever marine science program during a sports event, with over four million pieces of data collected.

The Holcim-PRB team collected water and air samples from edges of the world where few people go, and shared it with the World Meteorological Organization.

- They measured microplastic pollution
- Gathered information about the impact of climate change on our oceans
- Collected data to improve global weather forecasting

Above all, The Ocean Race was also a vehicle to mobilize everyone in Holcim, as well as our stakeholders, behind our mission to decarbonize building and GO CIRCULAR.

Taking the message from sea to city, we want to unite people behind our call to action, with Team Holcim-PRB showcasing Holcim’s unstoppable, winning and pioneering spirit.

**“It’s a true honor and dream come true for me to sail for Team Holcim-PRB. With GO CIRCULAR, we are fully committed to helping preserve our oceans and planet.”**

**NICOLAS LUNVEN**  
Skipper, Team Holcim-PRB

4

Continents visited by GO CIRCULAR in 2023 during The Ocean Race





Team Holcim-PRB kicked off the 2023 edition of The Ocean Race in Alicante, Spain

In September 2023 we welcomed two new skippers, Nicolas Lunven and Rosalin Kuiper, who will take the helm of the 60-foot Open monohull and keep the GO CIRCULAR spirit going with the same passion. With Team Holcim-PRB, they will spread our circularity message through onsite engagements and activations, partnering with relevant organizations to continue making a positive impact on our oceans.

After successfully completing the Retour à La Base, a race that forms part of the IMOCA Globe Series Championship, Nicolas Lunven got one step closer to qualifying Team Holcim-PRB for the Vendée Globe 2024-25. The race boat will continue carrying its message into the world's premiere round-the-world sailing races, Vendée Globe 2024 and The Ocean Race Europe 2025.

**“Sailing with a clear purpose to GO CIRCULAR from sea to city means a lot to me. It’s a great opportunity for me to add my voice to our shared vision of a more circular, sustainable and inclusive world.”**

**ROSALIN KUIPER**

Skipper, Team Holcim-PRB



Skippers Nicolas Lunven (second from left) and Rosalin Kuiper (right) visiting the Holcim Innovation Hub in Lyon





# ADVOCACY AND ENGAGEMENT

At Holcim we support public policy frameworks that help us to decarbonize building and build progress for people and the planet.

La Confluence in Namur, Belgium, is built with Holcim Elevate RubberGard™ EPDM, at the junction of the Sambre and Meuse rivers. After half a century of neglect, the area has been reborn into a vibrant space featuring a pedestrian-friendly esplanade, green zones, and a versatile multipurpose building



**IN THIS SECTION**

- 48** Advocacy positions and transparency
- 54** Just Transition
- 58** Holcim Foundation

**CASE STUDY**



# Decarbonizing cities at COP28

At COP28, Holcim engaged with key partners across the building value chain, so we can decarbonize cities faster together. From city mayors and urban planners to engineers, architects and civil society, Holcim stands ready to partner with them to help shape the cities of the future with our sustainable building solutions.

Nature topped our agenda too, as we urged more companies to join us in taking a transparent and measurable approach for a nature-positive future. Holcim's Nature Strategy focuses on preserving biodiversity and bringing more nature into cities.

During COP28, Holcim announced an expanded commitment to circularity as well by joining the Sustainable Markets Initiative's (SMI) Task Force to fast-track the shift to circular construction.

We also won two awards for our global carbon capture leadership. The COP Presidency initiative named us as an "Energy Transition Changemaker" for our Carbon2Business project in Lägerdorf, Germany. The same project was selected as Germany's "outstanding project" in the Mission Innovation Net-Zero Industries Awards.

-  Read more about our Nature Strategy on pages 124–127 in the *2023 Integrated Annual Report*
-  Watch our CSO at COP28 on how Holcim is engaging to decarbonize cities

# ADVOCACY POSITIONS AND TRANSPARENCY

Holcim is committed to advocating for public policy frameworks anchored in the principles of circular economy, that are fully aligned with the Paris Agreement's objective to limit the temperature increase to 1.5°C, and that enable innovative and competitive green growth.

Our "Strategy 2025 – Accelerating Green Growth" is fully aligned with the objectives of decoupling economic growth from carbon emissions and resource use:

- We take a rigorous science-driven approach to becoming a net-zero company, ensuring that our targets and actions are in line with the 1.5°C framework.
- We put decarbonization at the heart of our industrial and commercial strategy through the deployment, at scale, of advanced technologies such as Carbon Capture Utilization and Storage (CCUS) and the introduction of low-carbon solutions such as ECOPact concrete<sup>1</sup> on construction markets globally.
- We drive circular construction to build better with less (e.g. by recycling CDM in our products and processes, and using innovative technology such as 3D printing that reduces the use of materials by up to 50 percent).
- We develop solutions to make cities greener from foundation to rooftop and empower society with smarter infrastructure.

This journey requires radical collaboration with our entire value chain and with policymakers. In particular, we advocate for regulatory frameworks that:

- Enable the development of reasonable business cases to invest at scale in decarbonized technologies (e.g. competitive access to decarbonized energy, facilitated access to funding, and transparent regulatory frameworks for the use, storage and transportation of unavoidable CO<sub>2</sub> emissions).
- Create market demand for decarbonized and circular solutions (e.g. through harmonized product standards, and public procurement frameworks that drive innovation by being technology and material-neutral, based on building lifecycle performance).

- Enable industry to remain competitive on the global stage (e.g. through an international level playing field on carbon costs, fair state aid rules for energy-intensive sectors and dynamic carbon pricing).

## Climate policy positions

Holcim advocates for climate policy positions that enable:

### 1. Carbon capture, utilization and storage (CCUS)

One decarbonization lever that is fundamental to the sector's transition is CCUS. The regulatory frameworks that are currently being developed will play fundamental roles in enabling the CCUS value chain to become the necessary engine of the low-carbon and circular transition. No single solution will be perfectly scalable everywhere as different environments present different conditions (e.g. technological, geological and legislative) that favor one solution or another. This requires a flexible yet unequivocal regulatory framework:

- Recognizing carbon use as an integral part of the transition to net zero is a necessity, as is avoiding the design of restrictive regulatory frameworks that prevent the scale-up of industrial carbon capture projects. Policies under development (e.g. on synthetic fuels in the EU) cast serious doubts on the future of CO<sub>2</sub> utilization from industrial sources, without any serious impact assessment.
- A dynamic, accessible and competitive value chain for CO<sub>2</sub> transport and storage. Europe must focus on securing accessible infrastructure for carbon capture, transport and storage. The current monopolistic environment threatens the viability of many projects that would otherwise be implemented before 2030 (and which require planning, permitting and financing now).

<sup>1</sup> ECOPact low-carbon concrete offers at least 30 percent lower CO<sub>2</sub> emissions compared to standard local (CEM I) concrete, without offsets



## 2. Demand for low-carbon products and solutions

Holcim is committed to leading the transition toward low-carbon and circular construction by developing and introducing green products and solutions worldwide. In most cases, introducing them to the market generally requires an adapted product standard and its use must be facilitated by building codes and (public) procurement practices to create market demand.

Integrating sustainability performance in building codes, public procurement and product standards, alongside traditional criteria (safety, performance, durability and affordability) will lead to faster market uptake of low-carbon solutions.

- **Create market demand through a dynamic standardization and public procurement framework.** Having standards in place and implemented swiftly is fundamental to start building supply-demand momentum in the value chain that can be supported by (public) procurement practices and building codes.
- **Use of harmonized product standards remains the most appropriate approach.** In Europe, our experience with the cement standard EN 197-6 for the use of recycled concrete fines in cement shows that a non-harmonized approach hampers effectiveness, speed of deployment and cross-country optimization within the single market. All difficulties encountered nowadays to make applicable harmonized standards should be solved in close cooperation with industry as soon as possible, without unnecessary legal complexity or multiplication of regulations.

In the U.S., we fully support the administration's establishment of lower emission standards through Executive Orders such as the Federal Buy Clean Initiative. Our products can help them reach their targets with our industry-leading green building solutions.

### Carbon border adjustment mechanism (CBAM)

Fast and watertight implementation is key to its success. A swift implementation of the CBAM will provide the necessary foundations for large-scale investments in the decarbonization of our activities and products across the EU. It requires close collaboration with the sectors concerned to make sure that adequate (existing) standards are used (e.g. on greenhouse gas measurement, monitoring and reporting) and all potential circumvention routes are effectively closed. This process is fundamental to ensuring effective CO<sub>2</sub> cost equalization.

## 3. Lifecycle performance: a basis for the future of construction

Decarbonizing construction and making the value chain truly circular does not rely on a single technology or sub-sector. All materials and all technologies are part of the solution.

A policy framework and vision is needed that is based on technology neutrality and lifecycle performance. Defining the lifecycle performance that needs to be achieved to be aligned with 1.5°C will lead to a dynamic market based on innovation and performance.

## 4. Competitive and decarbonized energy

Access to competitive decarbonized energy is a critical enabler for the decarbonization of the industry:

- A well-functioning and interconnected electricity market with access to decarbonized energy at scale and at competitive prices is the cornerstone for the decarbonization of European industry and its short- and long-term competitiveness.
- Investments in renewable energy assets should be facilitated through faster permitting procedures, including for the development of renewable assets in industrial contexts.
- Industry also requires continued access to non-fossil sources of energy such as non-recyclable waste and biomass waste. These resources currently supply a large proportion of the cement sector's fuel needs, allowing it to become less dependent on imported fossil fuels while decarbonizing our processes.



At COP28 in Dubai, Holcim advocated for an acceleration of cross-sectoral collaboration to decarbonize materials and the built environment



## ADVOCACY AND ENGAGEMENT CONTINUED

### 5. Funding for decarbonized industrial growth

To build strong business cases and ensure the deployment of low-carbon technologies, industry requires access to combined sources of funding. This can be facilitated through:

- A simplified application and approval process to funding sources, allowing transparent and easy access. A shift to direct funding of CCUS for the cement industry can accelerate the construction phase of CCUS projects and, hence, decarbonization in regions such as the U.S. and Europe.
- In Europe, a swift deployment of Carbon Contracts for Difference (CCFDs) at the EU and national level to allow for a de-risking of projects based on access criteria that are simple and fast in execution.

▢ For a review of Holcim's climate policy positions, see [Holcim's Climate Public Policy Positions Report](#)

**“We have a huge challenge ahead but we have all the assets in hand. Belgium is going there with Belgian solutions, our industries, offshore wind turbines, [and] Holcim, which wants to make completely carbon-neutral cement.”**

**ALEXANDER DE CROO**  
Prime Minister of Belgium

### Trade Associations Climate Review

Our commitment to climate-related reporting is transparent and rigorous and we take the same approach in our advocacy positions.

Aligned with our net-zero pledge, Holcim is committed to ensuring that our direct and indirect lobbying through trade associations is aligned with the Paris Agreement and Holcim's positions outlined below.

- Support for the Paris Agreement's climate targets and net-zero agenda
- Support for the use of carbon-pricing mechanisms
- Development of industry roadmap to net-zero by 2050
- Acknowledgement of the need of advanced technologies, including CCUS, to further decarbonize (mainly for cement industry associations)
- Support of need to introduce low-carbon products

We selected the most significant organizations, ensuring a balanced geographical distribution and including global, regional and national organizations. The organizations were assessed by reviewing their public positions using their websites, media releases, publications, social media, questionnaires and, when needed, discussions with the local public affairs teams.



At COP28 in Dubai, Holcim gathered climate circularity leaders at our Goals House event, titled 'Circular cities: Housing for resilient urban communities'



We recognize that the journey to net zero requires radical collaboration across our entire value chain and with regulators, investors, NGOs, civil societies and employees. We are committed to working with these stakeholders and our trade associations to accelerate that journey. Where any selected organizations has material misalignment or diverging views with Holcim's policy positions and cannot be considered to be part of the acceleration to net zero, we commit to dissociate ourself from the trade association and related activities or, in extreme cases, renounce our mandates within the organization and/or our membership.

After our review, we pursued our work with all the organizations included in the scope to close the gaps and push for more alignment with our positions and commitments on climate policies. As a result, seven out of ten organizations that had not developed net-zero roadmaps three years ago, have now issued and published their roadmaps<sup>1</sup>. Two organizations that did not formally declare their support for the Paris Agreement have formalized their positions since. Holcim commits to continually assess the climate policy positions of our trade association and memberships on a periodic basis.

Holcim's public policy positions and its climate advocacy activities are systematically underpinned by the Group SBTi's 1.5°C roadmap and associated targets, which are externally verified and fully aligned with the Paris Agreement. Review of the climate policy positions of trade associations and industry bodies entails a review of our own policy position and confirms their alignment to the Paris Agreement and net-zero agenda.

<sup>1</sup> Calculation is excluding three associations that are no longer associated with Holcim



## ADVOCACY AND ENGAGEMENT CONTINUED

### Mandatory human rights and environmental due diligence

Holcim supports the implementation of regulatory frameworks that require mandatory human rights and environmental due diligence. A common legal requirement, such as that proposed at the EU level, contributes to bringing companies to the same standard. It also ensures that efforts made by companies to respect people and the planet are not undermined by the lack of uniform standards. Such regulatory frameworks increase legal certainty and ensure a competitive level playing field, to the benefit of the environment and of local communities.

### Climate-related advocacy in 2023

Throughout 2023, we were actively involved in the work of recognized and leading global organizations on sustainable construction, industrial decarbonization and the decarbonization of the built environment. This includes the World Business Council for Sustainable Development (WBCSD), the World Green Building Council (WGBC), UNIDO's Industrial Deep Decarbonization Initiative (IDDI), the First Movers Coalition (FMC) and the Leadership Group for Industrial Decarbonization (LeadIT). The collaboration with the aforementioned organizations forms the core of our advocacy at a global level, which is anchored wholly on advancing the principles of the circular economy and achieving the Paris Agreement's objective to limit the temperature increase to 1.5°C.

In 2023, as part of its activities to advocate global emissions reductions and the reaching of the Paris Agreement, and the aforementioned climate policy positions, Holcim mobilized its leadership to attend milestone global moments (such as COP28 and Climate Week NYC). Here, we advocated for an acceleration of cross-sectoral collaboration for decarbonizing materials and the built environment, and making cities a global decarbonization lever across all economies, while advancing a nature-positive future. Holcim's calls for action referred above are fully aligned to the Paris Agreement and the net-zero agenda.

In parallel, Holcim is driving decarbonization discussions in Industry Trade Associations such as Cembureau in Europe and Global Cement and Concrete Association (GCCA) at a global level. We are actively engaged in the development of an ambitious climate policy framework globally, at regional levels (e.g. in Europe) and national levels (e.g. in the U.S.).

As outlined in the previous section on public policy enablers, some of the topics that Holcim engages on include regulatory frameworks linked to CCUS, carbon pricing schemes, the development of competitive decarbonized energy networks, and the achievement of common definitions and standards of low-carbon cement and concrete.



Holcim engages on regulatory frameworks linked to Carbon Capture, Utilization and Storage (CCUS)



## SUMMARY OF ORGANIZATIONS AND POSITIONS

	Supports Paris Agreement and net-zero agenda	Supports carbon pricing mechanisms	Existence of a net-zero roadmap	Recognizes the need of advanced technologies, including CCUS	Supports introduction of low-carbon and/or net-zero products
<b>WORLDWIDE</b> GCCA	● Yes	● Yes	● Yes	● Yes	● Yes
<b>EU</b> CEMBUREAU	● Yes	● Yes	● Yes	● Yes	● Yes
<b>SWITZERLAND</b> CEMSUISSE	● Yes	● Yes	● Yes	● Yes	● Yes
<b>SWITZERLAND</b> ECONOMIESUISSE	● Yes	● Yes	● No formal roadmap but net-zero commitment to 2050	● Yes	● Yes
<b>UK</b> MPA	● Yes	● Yes	● Yes	● Yes	● Yes
<b>BELGIUM</b> FEBELCEM	● Yes	● Yes	● Yes	● Yes	● Yes
<b>SPAIN</b> OFICEMEN	● Yes	● Yes	● Yes	● Yes	● Yes
<b>FRANCE</b> SFIC	● Yes	● Yes	● Yes	● Yes	● Yes
<b>FRANCE</b> UNICEM	● Yes	● Yes	● Work in progress	● N/A	● Yes
<b>GERMANY</b> VDZ	● Yes	● Yes	● Yes	● Yes	● Yes
<b>POLAND</b> SPC	● Yes	● Yes	● Yes	● Yes	● Yes
<b>AUSTRIA</b> VÖZ	● Yes	● Yes	● Yes	● Yes	● Yes
<b>US</b> NRMCA	● Yes	● Yes	● Yes	● Yes	● Yes
<b>CANADA</b> CAC	● Yes	● Yes	● Yes	● Yes	● Yes
<b>AUSTRALIA</b> CCAA	● Yes	● No formal position given policy context	● Yes	● Yes	● Yes
<b>NEW ZEALAND</b> CONCRETE NZ	● Yes	● Yes	● Yes	● Yes	● Yes
<b>PHILIPPINES</b> CEMAP	● Yes	● No formal position	● No	● No formal position	● Yes

# JUST TRANSITION

We take a whole-society approach towards reaching net zero, respecting human rights while creating decent work and good jobs.

We are committed to decarbonization in line with the Just Transition principles. In the absence of a universal framework for a just transition, we have developed a framework to assess the impacts of our journey to net zero on four key stakeholder groups: our people, our suppliers, our communities and our customers.

## HOLCIM FRAMEWORK FOR A JUST TRANSITION

The framework is informed by various guidelines and initiatives, beginning with the International Labor Organization's (ILO's) Just Transition guidance, with its focus on workers, as well as the Paris Agreement's focus on communities and stakeholder engagement. We also considered:

- The Just Transition Dialogue Report by the Institute for Human Rights and Business (IHRB) and Wilton Park
- Key stakeholder groups identified as per the London School of Economics' Grantham Research Institute on Climate Change and the Environment in their 'Translating just transition ambitions into investor action' policy report
- Just Transition indicators presented by the World Benchmarking Alliance's Just Transition Methodology, considering ISO 26000 and United Nations Guiding Principles on Business and Human Rights

In 2023, we embedded the principals of our Just Transition framework into our Climate Policy and will continue to further integrate it into our climate strategy as external guidelines advance.



Planting mangroves with communities at the Holcim plant in Cilacap, Indonesia

## Our people

We are committed to creating a high-performance culture of empowerment, lifelong learning and development. We aim for all employees to develop their skills in a way that helps us achieve our green growth ambitions while they continue to thrive.

Employment in cement production will continue and the embedded skills of our workforce will continue to be of significant value in reaching net zero. We anticipate expanding roles in replacing limestone with innovative mineral components such as calcined clay, or construction demolition materials (CDM), as well as the pre- and co-processing of materials at end of life for fuels and alternative raw materials.

We also expect our carbon capture, utilization and storage (CCUS) commitments, which involve investing CHF 2 billion and capturing over five million tons of CO<sub>2</sub> annually by 2030, to create high-value opportunities for our workforce. We have identified 17 flagship projects, with each one well positioned to become a net-zero cement plant.

## Our suppliers

Our supply chain will change as a result of our transition to net zero. For example, our needs for raw materials will shift toward alternatives such as CDM. We will also expand into new business lines, such as roofing and insulation. We remain committed to a just transition for all the suppliers we work with. This commitment is framed across three main pillars:

- **Respecting human rights:** by actively monitoring and verifying compliance with our Supplier Code of Conduct and carrying out due diligence, according to our Human Rights Directive, in every market where we operate to identify, prevent and address human rights breaches.
- **Promoting health and safety:** We take a systematic approach to health and safety management within our supply chain, verifying compliance with applicable standards and regulations. Suppliers and contractors are selected based on their demonstrated qualifications in these areas. Ongoing training and performance monitoring enables effective management of health, safety and well-being.
- **Collaborating with suppliers:** We partner with key suppliers to decarbonize our supply chain. We enable multi-stakeholder platforms to accelerate the adoption of decarbonized technologies, such as electric trucks.



We are committed to creating a high-performance culture where our employees can continue to thrive



## ADVOCACY AND ENGAGEMENT CONTINUED

### Our customers

We are at the forefront of decarbonizing building throughout its lifecycle to ensure a net-zero future, building progress for people and the planet.

#### Building better with less

With our world's rising population and urbanization, Holcim is building better with less to improve living standards for all and build a net-zero future.

The key to decarbonizing construction is developing low-carbon materials and using smart design.

Since concrete is versatile, resilient and infinitely recyclable, we are continually innovating to make low-carbon concrete the building material for a net-zero future. Our ECOPact concrete offers significant CO<sub>2</sub> reductions without compromising on performance and is available in 31 markets.

#### Decarbonizing cities

Holcim solutions help decarbonize cities, from flooring and insulation to advanced mortars and green retrofitting. We are becoming a global leader in roofing with systems spanning cool, green and solar-enabling roofs.



### Did you know?

3D construction printing offers four key benefits: automation, speed, sustainability and design freedom. We are using smart design with 3D printing to build better with less, reducing materials by up to 50 percent. With 3D printing, we are creating high value, technologically advanced jobs that are replacing some traditional construction roles.

This automation is helping to mitigate critical labor shortages in mature markets such as Europe and North America. Technology advancements with 3D printing will ensure the construction industry can attract and retain the talent required to lead decarbonizing building across the value chain.

The speed of 3D printing is key to solving critical infrastructure shortages, such as the lack of adequate housing and infrastructure for 1.6 billion people in the world today. These problems are most acute in emerging markets.



The Mvule Gardens complex of 50 houses is using 3D printing to deliver affordable, climate-resilient homes in Kenya

## Our communities

At Holcim, we are on our journey to promote sustainable development through innovative building materials and solutions. We remain fully committed to creating a positive social impact in the communities where we operate.

### Addressing the vital need for housing

Approximately 2.8 billion people experience some form of housing inadequacy. We partner with communities and governments around the world to address this pressing issue, which is expected to become more urgent as a consequence of climate change.

Our experts develop innovative low-carbon solutions that bridge the gap in affordable housing and infrastructure.

We partner with organizations who share our goal of building affordable housing, such as Habitat for Humanity. We are a founding member of the Roof Over Our Heads campaign, which aims to improve the lives of two billion climate-vulnerable people living in informal settlements by 2050.

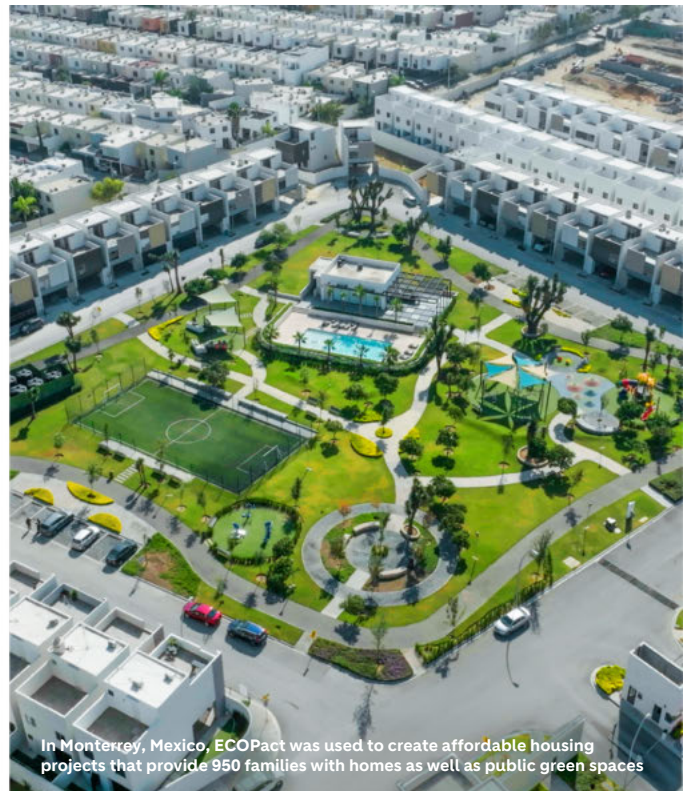
**“Partnering with Holcim channels market power and digitalization to improve living standards for those most in need. This partnership highlights the critical role that private sector partners like Holcim can play in increasing access to affordable housing for low-income families.”**

**JONATHAN RECKFORD**

CEO, Habitat for Humanity International



Casa Laguna, the largest affordable housing project in Ecuador to date, used ECOPact for a 3,500 unit housing development



In Monterrey, Mexico, ECOPact was used to create affordable housing projects that provide 950 families with homes as well as public green spaces



# HOLCIM FOUNDATION FOR SUSTAINABLE CONSTRUCTION

By empowering a community of changemakers, we can accelerate sustainable construction

The Holcim Foundation for Sustainable Construction drives impact in the built environment by supporting and connecting the next generation of industry innovators. In 2023, the Foundation expanded its international Holcim Awards competition for design professionals and launched new initiatives to support knowledge transfer among students and emerging talents.

## Holcim Awards 2023

The world's most significant competition for sustainable construction became bi-annual in 2023 and attracted 2,380 registrations of interest from 114 countries. Of the 500 submissions, five regional independent juries selected 20 winning projects that underscore the breadth of diverse and innovative real-world approaches to transforming the built environment. A prize pool of USD 1 million was awarded to winning projects in 17 countries.

These projects exemplify the growing global effort to provide holistic design and construction responses that advance multiple aspects of sustainable development. Supported by renowned architects from across the globe, the hybrid awards ceremony was held during the Biennale of Architecture in Venice, attracting over 3,700 participants.

**“Before, I was seen as a nice young man from Africa building schools. After winning a Holcim Award, people started to call me a designer and it paved the way for my career.”**

## DIÉBÉDO FRANCIS KÉRÉ

Founder, Kéré Architecture, Germany  
Laureate of the Pritzker Architecture Prize



Diébédo Francis Kéré addressing winners of the Holcim Awards 2023 at the Venice Biennale of Architecture





Mary C. Boyce, Provost of Columbia University, addressing Holcim Foundation Impact Summit participants in New York

### Supporting next-generation industry leaders

In 2023, the Holcim Foundation reinforced its commitment to supporting the next generation of architects, engineers and urban planners by launching its Next Generation Ambassadors program.

The inaugural group of bright young minds launched two community building projects in Tanzania and Indonesia, engaging with local NGO partners and over 50 students from a selection of partner universities to enable hands-on sustainable construction.

In Argentina and Brazil, beneficiaries of the Foundation's Research in Practice Grants produced promotional materials for their research. This included a book on ocean energy infrastructure and a documentary entitled 'Life on the Amazon Waters'. Their aim is to develop a deeper understanding of local construction processes and issues related to sustainability and housing.

### Sounding Boards engage young innovators

One of the Foundation's core goals is to connect innovative thinkers from different disciplines to drive impactful actions that can transform the built environment. Two new event formats were created to break down silos and accelerate the implementation of existing solutions.

Sounding Boards, held in Zurich, Rotterdam and Berlin, gave young innovators the opportunity to discuss their ideas with industry-leading peers. The Impact Summit, held at Columbia University in New York, brought together key players across the construction and real estate value chains, to drive collective action to reduce embodied carbon in buildings at a faster pace. The summit resulted in an industry-first alignment between nonprofits, which drafted a common framework for embodied carbon reporting for U.S. real estate professionals.

➔ Visit [holcimfoundation.org](https://holcimfoundation.org) for more information



Student and community workshop to select the design for a maternity clinic extension in Tanzania

**“A holistic paradigm of sustainability must encompass carbon cost, community, culture, and collaboration.”**

**Next Generation Ambassadors Manifesto**



# CLIMATE REPORTING

Taking a rigorous approach to climate governance, we carefully consider the risks and opportunities and report transparently.



Parque La Mexicana is an urban park in Mexico City, built with Fuerte high strength cement, has 100,000 square meters of forest area, 60,000 square meters of grasslands, an open-air theater, fields for different sports activities, a lake, 4.3 kilometers of cycle path, 3.4 kilometers of jogging path, a dog park and skatepark



**IN THIS SECTION**

- 62** Climate governance
- 64** Climate-related risks and opportunities
- 80** Scenario analysis
- 84** Performance data tables

## Nature-related financial disclosures

Taking a transparent, science-driven and rigorous reporting approach, we are expanding our nature disclosures as a Taskforce on Nature-Related Financial Disclosure (TNFD) early adopter. We are in a favorable position to implement the full scope of its recommendations in 2024.

Using the Exploring Natural Capital Opportunities, Risks and Exposure (ENCORE) tool, we confirmed that our most material nature-related impacts and dependencies (water use, land use including biodiversity, solid waste, greenhouse gas emissions) are identified in our ERM process and materiality assessment, and are integrated in the company strategy.

Leveraging our annual risk assessment exercise, we identify short- to medium-term threats at local level. This enables the operations to anticipate and adapt their business strategy to reduce, for example, freshwater withdrawal, engage with local stakeholders and prepare for potentially more stringent regulations and new market conditions.

To complement this bottom-up assessment, we leverage the latest technology for biodiversity and ecosystem mapping and anchor the nature risk and opportunity assessment as part of our climate resilience and adaptation program, which includes a detailed view of the nature-related dependencies and impacts of our operations.

[→ Read more on page 65](#)



## CLIMATE REPORTING

### HEALTH, SAFETY & SUSTAINABILITY COMMITTEE (HSSC)

Philippe Block (Chairman)

Leanne Geale

Naina Lal Kidwai

Claudia S. Ramirez

The Health, Safety & Sustainability Committee supports and advises the Board of Directors on the development and promotion of a healthy and safe environment for employees and contractors as well as on sustainable development and social responsibility.

For information on the role of the Health, Safety & Sustainability Committee with regard to governing the risks and opportunities around sustainability, including climate change, please see the chart below.

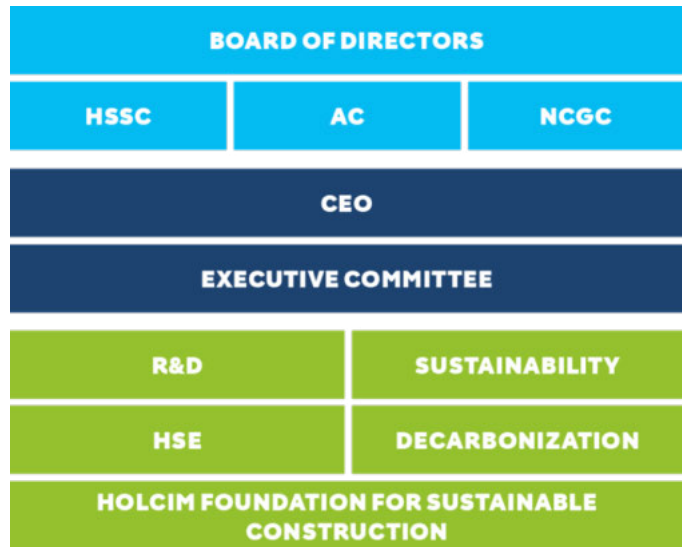
In 2023, the Health, Safety & Sustainability Committee held four ordinary meetings. The average duration of the meetings was one hour and fifty minutes.

In 2023, the topics discussed by the Health, Safety & Sustainability Committee included:

- Health, Safety and Environment KPIs and focus areas, in particular root causes for fatalities and strategic initiatives to reduce air emissions.
- Sustainability focus areas and ESG strategy including:
  - The Group's second Climate Report, presented at the 2023 AGM receiving 95.75 percent approval by shareholders
  - Launch of the sector's most ambitious decarbonization roadmap in Europe including six EU-awarded Carbon Capture, Utilization and Storage (CCUS) projects
  - Strategic Nature roadmaps for each country to reduce and replenish freshwater used as well as a science-based measurable positive impact on biodiversity
  - Holcim's selection as one of 17 companies by Science Based Targets Network (SBTN) to pilot the world's first science based targets for nature
  - Strategic People roadmaps for each country to meet social initiatives, pending targets, human rights assessments and affordable housing programs
  - Organizational readiness in light of upcoming non-financial disclosure
- Holcim's response to adverse events; mainly geopolitical events, pandemic/epidemic outbreaks and natural disasters
- Security & Resilience program, in particular the updated governance and key performance indicators

The Health, Safety & Sustainability Committee Charter is available at: [holcim.com/regulations-and-reporting](https://www.holcim.com/regulations-and-reporting)

### HOLCIM GOVERNANCE APPROACH CLIMATE- AND NATURE-RELATED RISKS AND OPPORTUNITIES



#### Board of Directors (BoD)

Ultimate responsibility for strategy and overall governance of the company, including Holcim's climate strategy. Through the AC and the HSSC, the BoD oversees Holcim's risk management and Internal Control Process, including sustainability/climate and nature-related risks and opportunities.

#### Health, Safety & Sustainability Committee (HSSC)

Advises the BoD on all matters related to sustainability, including those related to climate and nature. Consists of four Board members.

#### Executive Committee

Responsible for execution of the sustainability including climate and nature strategies.

#### Chief Sustainability Officer (CSO)

Climate and nature issues are managed on an operational level by the CSO, an Executive Committee-level position. The CSO is supported by a Sustainability core team.

#### Sustainability Core Team

A cross-disciplinary department responsible for developing and overseeing the deployment of Holcim's sustainability strategy.

#### R&D team

> 50 percent of Group R&D resources are dedicated to low-carbon products, across the Group's Innovation Centers in Holderbank, Switzerland and Lyon, France.

> 45 percent of patents are in low-carbon innovation with a further 20 percent related to other sustainability topics.

#### Decarbonization Team

Responsible for accelerating the implementation of both our traditional and next generation decarbonization levers based on bottom-up decarbonization plans for every cement plant.

In 2023, Holcim recycled 8.4M tons of construction demolition materials (CDM), up by 24% compared to 2022. The new Wood Wharf district in London is being built using Holcim's low-carbon concrete with CDM inside





## CLIMATE AND NATURE RISKS AND OPPORTUNITIES

With sustainability at the core of our strategy, we have implemented a comprehensive approach to anticipate climate and nature-related challenges, and enhance our ability to accelerate green growth.

### Identifying risks and opportunities

Our climate risk and opportunity assessment is embedded in our Enterprise Risk Management (ERM) process, as described in the Risk and Control section (pages 220–221 in the [2023 Integrated Annual Report](#)). We have tailored our approach to align with best practices and recommendations of the Task-force on Climate-related Financial Disclosures (TCFD). This enables a bottom-up assessment of climate risk and opportunities by each country.

Globally, as the political and industrial agenda moves firmly towards green growth, we see ambitious initiatives such as EU Green Deal and the U.S. Inflation Reduction Action that aim at decoupling economic growth from carbon emissions and resource use. Due to this shift in the political agenda, the risks and opportunities in relation to emerging climate and resource-related policies are a key element of our ERM process. This includes a comprehensive climate risk and opportunity assessment including (but not limited to) regulation and public policy scenarios, economic assumptions and project contingencies for significant CapEx projects such as those relating to carbon capture, utilization and storage.

### Short- and medium-term assessments

Climate risks and opportunities are assessed over both the short (< three years) and medium term (< ten years) in alignment with our 2030 sustainability targets. Long term risks and opportunities (up to 2050) have been assessed as part of our scenario planning (pages 80–83), where we have tested the resilience of our strategy, as well as the opportunities offered by innovative technologies.

Aligned with our ERM methodologies, the risks includes the inherent risk level (without considerations of the mitigations in place) and the residual risk level (after consideration of mitigations in place). Any residual risk that remains uncovered must be reduced with action plans documented in our Risk Management system. They are subject to a follow-up by the country Risk Lead.

## CLIMATE RESILIENCE AND ADAPTATION PROGRAM

The Group has implemented a climate resilience and adaptation program to identify and mitigate the potential impacts of current and future physical climate risks on our people, economic activities, assets and on nature. Our technology solution uses the climate scenarios of the Intergovernmental Panel on Climate Change (IPCC). The program identifies projected site-level risks over a range of climate pathways and time periods. This year we have increased the coverage of our assessment to include our cement plants (142) as well as 39 Solutions & Products sites.

[→ Read more about the program on page 73](#)

## Monitoring and reporting

At country level, the risk assessment involves all business areas. Involvement of the country Executive Committee and country CEO is required before submission to Group. The objective is to make sure that all potential areas of concern are included in the risk map, and to ensure that the risk assessment follows a forward-looking approach integrating the potential risks arising from the strategic initiatives or projects that might occur in the next three to ten years. At Group level, the country risk assessments are consolidated and adjusted, taking into consideration insights from stakeholders at Group level, allowing both local and global impacts to be considered.

We consider that any risk that impairs the achievement of our long term target is substantive. We also consider the impact on the Group's or local operation's reputation with investors, rating agencies, regulators and other external stakeholders such as NGOs or media.

Once consolidated, all assessments are summarized in our Group Risk report which is presented to the Audit Committee together with the Internal Audit Plan. Adopting an integrated risk and opportunity approach allows us to balance climate and nature risks against other material risks and opportunities, such as ones related to strategic, operational or external topics and facilitate the prioritization of the main threats.



## TASKFORCE ON NATURE-RELATED FINANCIAL DISCLOSURES (TNFD)

Holcim takes a transparent, science-driven and rigorous approach to its reporting, which includes best practices in relation to recommendations of the Taskforce on Nature-Related Financial Disclosures (TNFD). We are now expanding our nature disclosures as an early adopter of the TNFD.

- Using the tool Exploring Natural Capital Opportunities, Risks and Exposure (ENCORE), we were able to confirm that our most material nature-related impacts and dependencies (water use, land use including biodiversity, solid waste and greenhouse gas emissions) are identified in our overall ERM process and materiality assessment, and are integrated in the company strategy.

- Leveraging our annual risk assessment exercise, we identify short- to medium-term threats at local level. This enables the operations to anticipate and adapt their business strategy in order to reduce, for example freshwater withdrawal, engage with key local stakeholders and prepare for potentially more stringent regulations and new market conditions. In order to complement this bottom-up assessment, we leverage the latest technology for biodiversity and ecosystem mapping and anchor the nature risk and opportunity assessment as part of our climate resilience and adaptation program, which also includes a detailed view of the nature-related dependencies and impacts of our operations.
- We believe that our strong governance based on our Health, Safety and Sustainability Committee, coupled with our nature strategy with measurable water and biodiversity commitments, places our company in a favorable position to implement the full scope of the TNFD recommendations in 2024.

## TCFD/TNFD ADOPTION TIMELINE

Holcim's journey towards implementing and promoting Taskforce on Nature-Related Financial Disclosure (TNFD) and Taskforce on Climate-Related Financial Disclosures

### 2018

**Implementation of TCFD framework**  
Dedicated governance, strategy, risk management and metrics are specifically designed to address the climate challenge.

### 2021

**TNFD launch**  
Holcim selected to be an official task-force member of the TNFD (out of 17 corporate companies selected).

### 2023 and beyond

**Early adopter of the TNFD framework**  
Leveraging the integration of TCFD into our ERM process, we are ramping up on the implementation of TNFD recommendations. A gap analysis was performed and we started to fully embed all the elements of Nature into our ERM process, to ensure full compliance with TNFD in 2024.

### 2020

**Participation to the TCFD Preparer Forum for the Construction sector**  
Recognized as a reference in providing climate-related disclosures, our company committed to the promotion of TCFD recommendations.

### 2022

**Industry's first Climate Report**  
With our Climate Report, a first in our sector, we further strengthened our climate-related disclosures and transparency by explaining in great detail our decarbonization roadmap. In 2023, our second Climate Report received a 95.75 percent advisory vote in favor from our shareholders.



## CLIMATE AND NATURE RISKS AND OPPORTUNITIES CONTINUED

### TASK FORCE ON NATURE-RELATED FINANCIAL DISCLOSURES (TNFD) ALIGNMENT

<b>GOVERNANCE</b>	<p><b>Board oversight</b></p> <ul style="list-style-type: none"> <li>Refer to “Holcim governance approach Climate and Nature-related risks and opportunities”, page 167, “Information and control instruments of the Board of Directors,” page 169, “Long Term Incentives”, page 201, and “Risk and Control” &gt; Roles and responsibilities, page 221</li> </ul>	<p><b>Management’s role</b></p> <ul style="list-style-type: none"> <li>Refer to “Risk and Control” &gt; “Roles and Responsibilities,” page 221</li> </ul> <p><b>Organization’s engagement with local stakeholders</b></p> <ul style="list-style-type: none"> <li>Refer to “Human Rights”, page 140</li> </ul>
<b>STRATEGY</b>	<p><b>Identification of nature-related dependencies, impacts, risks and opportunities over the short, medium and long term</b></p> <ul style="list-style-type: none"> <li>Refer to “Material Priorities”, pages 222–223, “Climate and Nature Risks &amp; Opportunities”, pages 236–251</li> </ul> <p><b>Effects nature-related dependencies, impacts, risks and opportunities have on the organization</b></p> <ul style="list-style-type: none"> <li>Refer to “Our Approach”, pages 60–61, “Climate and Nature Risks &amp; Opportunities”, pages 236–251</li> </ul>	<p><b>Resilience taking into account different scenarios</b></p> <ul style="list-style-type: none"> <li>Refer to “Climate and Nature Risks &amp; Opportunities”, pages 236–251, “Scenario Analysis”, pages 252–255</li> </ul> <p><b>Location of assets and activities on direct operations, upstream and downstream that are in priority locations</b></p> <ul style="list-style-type: none"> <li>Refer to our Sustainability Performance Data Tables on pages 406–407</li> </ul>
<b>RISK AND IMPACT MANAGEMENT</b>	<p><b>Identification and prioritization of impacts, dependencies, risks &amp; opportunities in direct operations</b></p> <ul style="list-style-type: none"> <li>Refer to “Our Approach”, pages 60–61, “Material Priorities”, pages 222–223, “Climate and Nature Risks &amp; Opportunities”, pages 236–251</li> </ul> <p><b>Identification and prioritization of impacts, dependencies, risks &amp; opportunities in upstream and downstream value chain</b></p> <ul style="list-style-type: none"> <li>Refer to “Climate and Nature Risks &amp; Opportunities”, pages 236–251, “Measuring Our Value”, page 264</li> </ul>	<p><b>Managing impacts, dependencies, risks &amp; opportunities</b></p> <ul style="list-style-type: none"> <li>Refer to “Climate and Nature Risks &amp; Opportunities” section, pages 236–251</li> </ul> <p><b>Integration with overall risk management processes</b></p> <ul style="list-style-type: none"> <li>Refer to “Risk and Control” section, pages 220–255, “Information and control instruments of the Board of Directors,” page 169, “Measuring Our Value”, page 264</li> </ul>
<b>METRICS AND TARGETS</b>	<p><b>Metrics to manage risks and opportunities</b></p> <ul style="list-style-type: none"> <li>Refer to “Climate and Nature Risks &amp; Opportunities”, pages 236–251, Sustainability Performance Data Tables on pages 403–411</li> </ul> <p><b>Metrics dependencies and impacts on nature</b></p> <ul style="list-style-type: none"> <li>Refer to “Our Approach”, pages 60–61, Sustainability Performance Data Tables on pages 403–411</li> </ul>	<p><b>Targets and goals</b></p> <ul style="list-style-type: none"> <li>Refer to the “Our Approach”, pages 60–61, Sustainability Performance Data Tables on page 403</li> </ul>

### TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURES (TCFD) ALIGNMENT

<b>GOVERNANCE</b>	<p><b>Board oversight</b></p> <ul style="list-style-type: none"> <li>Refer to “Holcim governance approach for climate and nature-related risks and opportunities”, page 167, “Information and control instruments of the Board of Directors,” page 169, and “Risk and Control” section &gt; Roles and responsibilities, page 221</li> </ul>	<p><b>Management’s role</b></p> <ul style="list-style-type: none"> <li>Refer to “Risk and Control” section &gt; “Roles and Responsibilities,” page 221</li> </ul>	
<b>STRATEGY</b>	<p><b>Risks and opportunities over the short, medium and long term</b></p> <ul style="list-style-type: none"> <li>Refer to “Climate and Nature Risks &amp; Opportunity” section pages 236–251</li> </ul>	<p><b>Impact on the organization’s business, strategy and financial planning</b></p> <ul style="list-style-type: none"> <li>Refer to “Risk and Control” section, pages 220–255 and “Climate and Nature Risks &amp; Opportunity” section pages 236–251</li> </ul>	<p><b>Scenario planning</b></p> <ul style="list-style-type: none"> <li>Refer to our Climate and Nature Risk &amp; Opportunity section &gt; Scenario planning, pages 252–255</li> </ul>
<b>RISK MANAGEMENT</b>	<p><b>Climate change-related risks identification and assessment</b></p> <ul style="list-style-type: none"> <li>Refer to “Risk and Control” section, pages 220–255 and “Climate and Nature Risks &amp; Opportunity” section pages 236–251</li> </ul>	<p><b>Climate change-related risks management</b></p> <ul style="list-style-type: none"> <li>Refer to “Risk and Control” section, pages 220–255 and “Climate and Nature Risks &amp; Opportunity” section pages 236–251</li> </ul>	<p><b>Integration into overall risk management</b></p> <ul style="list-style-type: none"> <li>Refer to “Risk and Control” section, pages 220–255 and “Information and control instruments of the Board of Directors,” page 169</li> </ul>
<b>METRICS AND TARGETS</b>	<p><b>Reporting CO<sub>2</sub> metrics</b></p> <ul style="list-style-type: none"> <li>Refer to our Sustainability Performance Data Tables on pages 403–405</li> </ul>	<p><b>Details Scope 1, 2 and 3</b></p> <ul style="list-style-type: none"> <li>Refer to our Sustainability Performance Data Tables on page 405</li> </ul>	<p><b>CO<sub>2</sub> targets</b></p> <ul style="list-style-type: none"> <li>Refer to our Sustainability Performance Data Tables on page 403</li> </ul>

↩ All page references refer to the [2023 Integrated Annual Report](#)

## CLIMATE RISKS AND OPPORTUNITY SUMMARY TABLE

Our climate risk and opportunity assessment has been performed following the TCFD framework.

Climate risks and opportunities have been fully accounted for in our transformational business model that has four strategic decarbonization pillars: decarbonizing operations, decarbonizing construction, decarbonizing cities and circular construction.

We believe that the risks and opportunities presented here are the most material ones for our company, although other risks or opportunities might materialize, especially as a consequence of the evolution of policy, economic or technological landscapes.

RISKS		OPPORTUNITIES	
Policy and Legal	<b>Ineffective climate policies</b>	Resource efficiency	<b>Accelerating circularity in construction</b>
Market	<b>Slow market acceptance for low-carbon products and solutions</b>	Energy source	<b>Access to competitive decarbonized energy</b>
Technology	<b>Feasibility of new technologies (including CCUS) across all relevant geographies</b>	Products / services	<b>Decarbonizing the built environment</b>
Reputation	<b>Damaged reputation due to undocumented or unsubstantiated green claims</b>	Markets	<b>Growing demand for low-carbon and climate resilient solutions and products</b>
Physical risk	<b>Damaged assets and operations</b>		

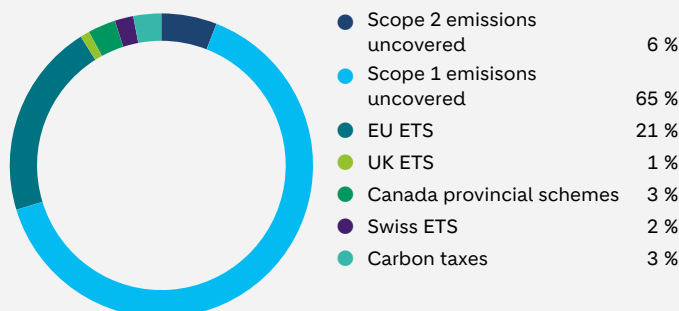


**RISK INEFFECTIVE CLIMATE POLICIES**

Description	Potential Impact	Our Response
<p>The shift to a decarbonized business model requires strong climate regulations, such as the EU ETS (complemented with the Fit for 55 package) with stable, fair and reliable CO<sub>2</sub> prices. In the long term, the attitudes towards climate change outside the EU, especially in the U.S., will be a tipping point for the achievement of our net zero commitments.</p>	<p>Even though the political and industrial agenda is firmly moving toward green growth, ineffective collective action against climate change in the long run would create a misalignment between our efforts to reach net-zero emissions and the regulatory framework, resulting in a competitive disadvantage. On the contrary, more stringent CO<sub>2</sub> regulations, and the associated set of environmental measures, would reinforce our competitive advantage as we decarbonize following our ambitious emissions targets. As the most advanced regulatory environment worldwide for the climate transition, the European Union recently adopted a Carbon Border Adjustment Mechanism (CBAM) as a central engine of the low-carbon transition. However, it will require a diligent and “watertight” implementation (effectively closing all circumvention routes) to establish the needed effective, fair and reliable level playing field on carbon costs between domestic manufacturers and importers and protect the competitiveness of the European cement players. This forms the central pillar of the low-carbon business case and is fundamental to our ability to invest on a large scale in the deployment of low-carbon technologies and products. In the U.S., although there is no regulatory framework comparable to the European ETS, the political agenda is also moving toward green growth, with recent initiatives, such as the Inflation Reduction Act in 2022, which create an overarching incentivising environment to deploy low-carbon and resource efficient technologies at scale. In the long term, we anticipate additional sets of measures in the journey to a low-carbon economy, such as the ones that set rules for explicit green claims or the communication to the financial markets. Any new regulation that creates a robust environment that encourages direct investments towards sustainable projects and helps scale up sustainable development towards the objectives of the European Green Deal represents an opportunity for our Group.</p> <p><b>Impacts on financial reporting</b></p> <p>Useful lives of assets may be affected by climate-related matters because of transitional risks such as obsolescence and legal restrictions. The change in useful lives has a direct impact on the amount of depreciation or amortization recognized each year. Management’s review of useful lives has taken into consideration the impacts of the Group’s 2030 targets. It can also lead to the impairment of operating assets that no longer comply with more stringent environmental measures. Climate-related matters may affect the level of provisions recognized, such as site restoration provision and litigation provision as a result of the levies imposed by governments for failure to meet climate-related targets or new regulations, requirements to remediate environmental damages on Holcim’s sites or due to existing obligations now being considered more likely. Some contracts may become onerous as a result of climate-related changes, which would potentially decrease the Group’s revenue or increase its operating costs.</p>	<p>Our CO<sub>2</sub> reduction roadmap follows a best-in-class approach with both our 2030 and 2050 targets (net-zero pledge) validated by the SBTi as aligned with 1.5°C.</p> <p>To accelerate green growth, Holcim is deeply transforming its business model in order to be a major player in decarbonizing building across the value chain, to reduce emissions and build smarter and better with less. Changes in regulatory frameworks worldwide are regularly monitored centrally in order to assess our exposure to new CO<sub>2</sub> pricing schemes, but also to identify opportunities and market incentives for low-carbon products or any developments that require us to accelerate or adapt the deployment of our decarbonization roadmap. Aligned with the most recent regulatory moves towards sustainable green growth such as Europe’s Green Deal and the U.S. Inflation Reduction Action, our “Strategy 2025 – Accelerating Green Growth” has put decarbonization at the heart of our industrial and commercial strategy, driving circular construction to build better with less and developing solutions to make cities greener from foundation to rooftop.</p> <p>Holcim continues to proactively and transparently engage with external stakeholders and advocate for climate policies that are aligned to the Paris Agreement 1.5°C and enables us to accelerate the deployment of low-carbon solutions in order to execute and meet the objectives of our decarbonization roadmap. With that perspective, we support globally the enhancements of the regulatory environment aiming to:</p> <ul style="list-style-type: none"> <li>• Support the business case to invest at scale in decarbonized technologies (including CCUS),</li> <li>• Incentivize market demand for decarbonized and circular solutions,</li> <li>• Facilitate access to competitive decarbonized energy,</li> <li>• Implement effective carbon pricing mechanisms and enable industry to remain competitive on the global stage.</li> </ul>

## RISK INEFFECTIVE CLIMATE POLICIES CONTINUED

### OVERVIEW OF OUR EXPOSURE TO CO<sub>2</sub> REGULATIONS



- Currently, 29 percent of our emissions are exposed to CO<sub>2</sub> regulations.
- Besides carbon pricing and taxes, other climate policies might have an influence on our decarbonization roadmap, especially those policies that allow us to maintain the competitiveness of low-carbon technology investments in the cement industry, and that set rules for the re-use of captured CO<sub>2</sub>, as well as waste management regulations.
- Europe is the most advanced region, with a mature Emissions Trading Scheme (ETS) which incentivizes carbon reduction initiatives. Coupled to other climate policies (revised building codes, EU Taxonomy), Europe offers huge opportunities for the successful implementation of our net-zero roadmap.
- The U.S. stands apart as the country is a patchwork of federal and state regulations mostly not covered by an ETS, despite certain states having one or planning to implement one. However, the current approach is based on mostly voluntary initiatives, with few federal regulations being implemented, while certain states are setting regulations and standards (building codes, public procurement, transparent communication), which might not be enough to support decarbonization efforts and investments in breakthrough technologies. Yet, the recent Inflation Reduction Act (2022), promoting investments in decarbonization projects and securing long term strategies, is likely to offer a specific path to a decarbonization model.
- Latin America is moving towards carbon regulation similar to the EU ETS, with pilots in certain countries, notably Mexico. We anticipate that the implementation of carbon pricing in Latin America will support our efforts to decarbonize.
- In the long term, the absence of more stringent and ambitious CO<sub>2</sub> regulation in Middle East, Africa or Asia may lead to future conflicts between financial performance and emission reductions, should market dynamics be insufficient to support decarbonization efforts.

## RISK SLOW MARKET ACCEPTANCE FOR LOW-CARBON PRODUCTS AND SOLUTIONS

Description	Potential Impact	Our Response
<p>Holcim's decarbonization journey entails the capacity to meet customers' product quality and decarbonization expectations. Indeed the successful launch of our global low-carbon brands ECOPact and ECOPlanet exposes the Group to new threats in case the Group is unable to build a strong credibility with its customers, document and back-up environmental claims, develop strategic partnerships or promote a marketing and product-led approach within the Group.</p>	<p>A slow market acceptance for low-carbon products and solutions could lead to revenue losses due to reduced demand and limitations to improvements in margins. While there is no viable substitute to cement on a global scale that is sustainable, affordable and local, an increased pressure to decarbonize the built environment may support a growing demand for low-carbon products and solutions, thus potentially increasing our market share in the range of low-carbon cement and sustainable solutions.</p> <p><b>Impacts on financial reporting</b> Impairment testing is performed at the cash generating unit (CGU) level and in assessing the valuation of a CGU, future cash flows have been estimated. This includes making assumptions in relation to the impact of climate-related matters on future profitability. The impact of climate-related matters could result in higher costs and reduced revenues affecting the future taxable profits on which the recognition of deferred tax assets are based. Business plans used for the recognition of deferred tax assets have been aligned with those used in the impairment process, taking into account climate-related impacts.</p>	<p>Our approach is to meet customer needs along the whole construction value chain by developing and delivering solutions that address today's major construction challenges (scarcity of resources, sustainable and resilient infrastructure, urbanization), turning sustainable growth into profitable growth.</p> <p>We offer our customers advanced sustainable solutions to best meet their needs and have already expanded our multi-billion brands delivering premium margins. We have built billion-dollar low-carbon brands from ECOPact concrete and ECOPlanet cement which are sold at a range of low-carbon levels. By 2030, Holcim will grow both brands, which offer customers at least 30 percent less CO<sub>2</sub> compared with local standard (CEM I / OPC) concrete and cement. With the help of carbon capture, we are aiming to produce eight million tons of fully decarbonized ECOPlanet cement per annum by 2030. We will also grow our low-carbon concrete from 19 percent in 2023 to above 25 percent of Group Ready-Mix Net Sales by 2025. Where possible, our solutions are independently verified through Environmental Product Declarations (EPDs), which validate the environmental profile of our product and ensure transparency.</p>



**RISK FEASIBILITY OF NEW TECHNOLOGIES (INCLUDING CCUS) ACROSS ALL RELEVANT GEOGRAPHIES**

Description	Potential Impact	Our Response
<p>The inability to deliver Carbon Capture Utilization and Storage (CCUS) projects or develop necessary technologies that meet both technical and financial expectations could prevent Holcim from achieving its decarbonization targets.</p>	<p>The successful scaling up of CCUS relies on assumptions and projections regarding external factors such as compatibility with CO<sub>2</sub> usage opportunities, climate regulations, market acceptance of low-carbon products, the existence of large transportation infrastructure and other aspects of viability and scalability. In addition, there are contingencies related to the management of the projects especially with regards to the management of technical interfaces and the relationships with stakeholders (public administrations, partners, suppliers, communities). In the long term, should CCUS be confirmed as the main technology to remove CO<sub>2</sub>, there is a risk of stranded assets where CCUS is not feasible (absence of transport infrastructure, insufficient storage capacities, insufficient renewable power or water supply, etc.) and a loss of leadership in the decarbonization journey.</p> <p>The pathway from 2030 to 2050 also integrates a large range of both new and established technologies including novel binders (calcined clay), zero-emission vehicles and low-clinker cements. For the latter, higher prices for mineral components (MIC) such as slag and fly ash challenge our CO<sub>2</sub> reduction roadmap as the integration of MIC in our cement production process is a key lever for the reduction of clinker factor and thus reduction of our CO<sub>2</sub> footprint.</p> <p><b>Impacts on financial reporting</b> Useful lives of assets may be affected by climate-related matters because of transitional risks such as technological obsolescence. It can also lead to the impairment of operating assets. Sustainability is now a key factor considered by the Group in any investment decision. The transition to lower-emission technologies will impact the allocation of future CapEx. The Group's R&amp;D expenditures are aligned with the strategy to focus on new and alternative technologies that, as a result of diverse research initiatives, may either impact CapEx or R&amp;D costs in the statement of income, depending on the success of the initiatives.</p>	<p>We investigate every opportunity, at every stage of a building's life cycle, to eliminate emissions and build smarter and better. Leveraging on proven processes and existing technologies, we are optimizing our own consumption of resources, using low-carbon energy and fuel, and reducing our water use.</p> <p>In line with our 2025 strategy, we accelerate the decarbonization of our own operations to become a net-zero company, by switching to renewable energy, developing new formulations, adopting decarbonized mobility and harnessing advanced technologies such as carbon capture, utilization and storage (CCUS). As an example, we launched in February 2023 Europe's first calcined clay low-carbon cement operation in Saint-Pierre-la-Cour, France, enabling us to deliver ECOPlanet low-carbon cement with 50 percent lower CO<sub>2</sub> footprint. We also launched ECOCycle®, a proprietary platform to drive circular construction at scale across key metropolitan areas.</p> <p>Furthermore, 2023 was a year the Group successfully demonstrated its ability to firmly accelerate its global transition to a net-zero future especially with the ramping up of CCUS projects, with six full-scale CCUS projects across Europe having been selected for grants from the European Union (EU) Innovation Fund to capture five million tons of CO<sub>2</sub> by 2030. We have a solid portfolio of CCUS projects globally. In Europe, we have additional projects in advanced stages of planning. Based on various technologies, robust partnerships and value chains, these sites are well positioned to become net-zero cement plants and drive our Group to net-zero. Holcim is a partner of choice in the CCUS ecosystem in Europe and continues to actively engage with public authorities, industry partners, customers and communities. In addition, new economic conditions could emerge in the long term (steady development of e-fuels, growing usage of captured CO<sub>2</sub> by the chemical industry) and drive a significant shift from CO<sub>2</sub> storage to CO<sub>2</sub> utilization, improving the profitability of CCUS and offering new outlooks for this business model. Holcim also continues to explore promising opportunities such as smart design, novel binders, kiln electrification and use of hydrogen.</p>

**HARNESSING PROMISING CCUS PROJECTS TO REACH NET ZERO**

While it is clear that no single solution will be scalable at all locations, as different environments present different conditions, there is a risk that we are not fully benefiting from the promising opportunities offered by the CCUS, hence our decarbonization agenda would be compromised. For that reason, we have ensured that our portfolio of projects is based on the broadest selection of mature technologies and applications (including those with proven results in other industries), offering the largest range of possible solutions in order to implement CCUS in locations taking into account the local context (existence and reliability of local infrastructure for CO<sub>2</sub> transportation or storage, industry partners, economic environment, regulatory frameworks).

The successful deployment of CCUS technology is underpinned by an effective project management in order to build strong credibility with our partners and secure public funding. Holcim is thoroughly assessing the potential impacts on the environment or the communities where we operate throughout the full value chain:

- Energy consumption: capturing CO<sub>2</sub> is an energy intensive process. Our projects are assessed according to availability of renewable energy sources.
- Water withdrawals / consumption: CCUS typically requires water for the capture process, where a large portion of the water is needed for cooling purposes, and may generate wastewater. Through the implementation of efficient closed-loops recycling systems and the shift to non-freshwater sources, the use and disposal of water will be managed carefully to minimize environmental impacts.

- Communities: we are looking at both onshore and offshore CO<sub>2</sub> storage facilities. The concerns related to the safety of storing CO<sub>2</sub> underground and potential leaks that could impact nearby communities are thoroughly assessed.
- Scope 3 emissions: depending on the application (storage or utilization) carbon capture technologies will have an impact on our Scope 3 emissions. These are evaluated project by project and accounted for in our Scope 3 modeling. The configuration and ownership of the carbon capture facility down the value chain will shape the accounting of Scope 1, 2 and 3 emissions. Holcim is monitoring the evolution of these standards and advocating for a fair and balanced approach.

The Group's long term CCUS strategy is based on a both planned and opportunistic timing of numerous CCUS projects, starting in locations where the context is the most relevant, especially in jurisdictions which are already proactively supporting the CCUS technology, or where infrastructure and geographies for transportation and storage are already present. Accelerating on the transition to a decarbonized economy, Holcim responsibly advocates for both onshore storage and re-usage of CO<sub>2</sub>. We are actively partnering with stakeholders who support the transition to a decarbonized economy, such as governments, industry bodies or equipment suppliers, to enable the development of conditions for success. Understanding the key success factors from the initial projects in Europe and North America, we will provide an environment that will facilitate the implementation of CCUS in plants where the opportunities for CCUS are currently being developed.

➔ Please refer to pages 28–29 for more details regarding our CCUS roadmap

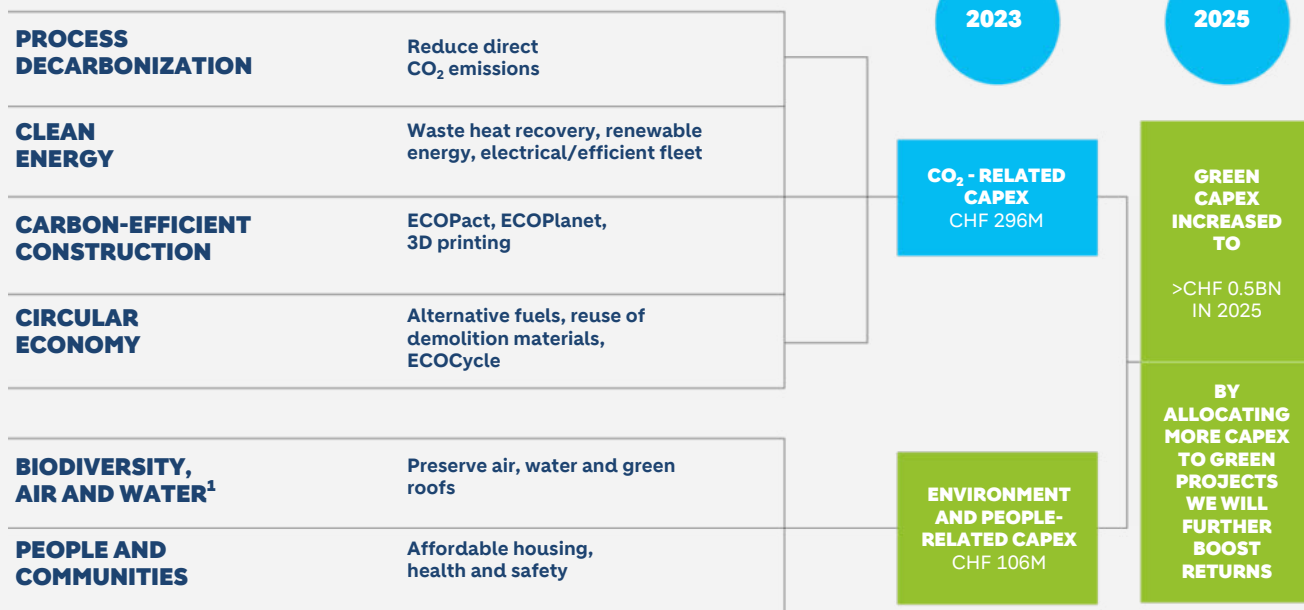
**RISK GREEN CAPEX AT HOLCIM**

At Holcim, we put sustainability at the core of our strategy to build a net-zero future. Our focus on green investments is a fundamental aspect of this strategy.

In 2023, our Green CapEx reached CHF 402 million, including investments of CHF 296 million in projects to accelerate our CO<sub>2</sub> reduction, and CHF 106 million in environment and people-related projects. We will increase our annual green CapEx to CHF 500 million by 2025. These investments will impact all our operations and geographies and will encompass existing technologies with proven returns.

We are committed to align capital expenditure plans with our long-term net-zero reduction target, which has been validated by SBTi and is aligned with the Paris Agreement’s objective of limiting global warming to 1.5°.

**GREEN CAPEX CATEGORIES**



<sup>1</sup> CHF 0.1 million for biodiversity related CapEx, CHF 12.4 million for water related CapEx

## CLIMATE AND NATURE RISKS AND OPPORTUNITIES CONTINUED

### RISK DAMAGED REPUTATION DUE TO UNDOCUMENTED OR UNSUBSTANTIATED GREEN CLAIMS

Description	Potential Impact	Our Response
<p>The Group's inability to meet its commitments (net zero pledge), if materialized, is likely to damage the Group's reputation and reduce our attractiveness to stakeholders such as customers, investors, and potential employees.</p>	<p>In light of increased public scrutiny on green claims, there is a growing reputational risk in case the Group does not achieve its climate targets, as found to have misreported its emissions, if its targets and claims are not ambitious enough, or if they are deemed incomplete, vague, ambiguous or insufficiently documented on a scientific basis. In addition, litigation on the basis of climate action failure (including misreporting of emissions) is emerging and could also exacerbate reputational damages.</p> <p><b>Impacts on financial reporting</b> Holcim has increased diversification of financing instruments with, for example, sustainability-linked bonds, which are linking our funding with our sustainability objectives. This could have an impact on the Group's financial expenses in the event the Group does not reach the targets that have been set.</p>	<p>The Group's first priority and strategy is Accelerating Green Growth as a global leader in innovative and sustainable building solutions. We continuously ensure our targets stay abreast with the latest scientific developments and the highest level of scientific rigor. For this reason, Holcim was the first company in its sector to have 2030 and 2050 net-zero targets validated by the Science Based Targets initiative (SBTi), as aligned with a 1.5°C pathway. To ensure emissions reductions are in line with our corporate targets and decarbonization roadmap, we establish plant-level climate mitigation. Furthermore, we ensure rigorous emissions accounting for both our direct and indirect CO<sub>2</sub> emissions based on the latest emissions accounting protocols.</p> <p>To reflect the credibility of our sustainability commitments to investors, Holcim ahead of a bond issuance always assesses the feasibility to offer sustainability linked bonds to its investors. More recently Holcim updated its financing framework and added the option to issue green bonds which will be associated to the bond offering.</p> <p>Our brands ECOPact and ECOPlanet becoming multi-billion CHF brands, we control that each of those products follow strict clear global brand qualification criteria whose alignment with regulatory requirements are continuously monitored.</p>

### CLEAR, TRANSPARENT CRITERIA FOR LOW-CARBON PRODUCT CLAIMS

## ECOPact ECOPlanet

In 2021 and 2022, Holcim voluntarily and proactively launched brands with low-carbon criteria supported by clear, documented and publicly available credentials. In the absence of recognized external standards at the time, Holcim initiated its own definition of low-carbon products.

In recognition of rapidly increasing regulatory regulations and in accordance with our objective to foster the emergence of internationally recognized standards of low-carbon products, Holcim is continuously updating and reinforcing the alignment of low-carbon brand definitions to external global frameworks such as the Industrial Deep Decarbonisation Initiative (IDDI) from United Nations Industrial Development Organization (UNIDO).

Transparency is key on Holcim's net zero journey, and we are committed to providing reliable environmental information so that our customers can build with low-carbon materials in a transparent, verified way. We have partnered with Climate Earth to expand Environmental Product Declarations (EPDs) worldwide, utilizing Climate Earth's EPD Generator™ digital platform. An independent verification system that validates the environmental profile of products including ECOPact and ECOPlanet, EPDs are vital to accelerate low-carbon demand and decarbonize building at scale.

### RISK DAMAGED ASSETS AND OPERATIONS

Description	Potential Impact	Our Response
<p>The physical consequences of climate change (such as increased regularity of extreme weather events and water scarcity) have the potential to disrupt our operations on both on-site and value chain transportation activities leading to higher costs and reduced production capacity (e.g. delayed planning approval, supply chain interruptions), business interruptions and even reputational damages.</p>	<p>The most critical current climate risks to our business are water related. When water levels are too high this can harm our on-site operations with potential impacts on people and our assets, such as the recent flooding in Bangladesh. Additionally, in areas where we leverage local rivers for transportation, such as the Mississippi, significant variations in river water levels, both high and low, affect our river-based supply chains and product delivery. Water is a vital resource in our traditional businesses and increased scarcity has the potential to increase the likelihood of disruptions to production. As the climate changes, extreme weather events are likely to increase and the most critical physical risks will be storms causing floods and drought with potentially higher associated insurance costs.</p> <p><b>Impacts on financial reporting</b> Physical deterioration of our production assets would result in potential impairment. The climate-related matters may affect the value of inventories as they may become obsolete as a result of a decline in selling prices or an increase in costs. The cost of inventories that are not recoverable must be written down to their net realizable value. The change in the climate may imply more regular and intense climate events that can have a significant impact on our production with business interruption, accident or damages. This may increase our insurance costs due to the higher amounts at stake or more frequent insured cases.</p>	<p>In 2023, we expanded the assessment of physical risks associated with climate change to over 100 material sites. The intent is to implement this program, on a risk basis, across the whole Holcim portfolio. Once fully implemented in all sites, the program will capture site level preparedness to current and future risks while enabling the development of mitigation programs complemented with strategic resilience plans for longer term and structural risks. At a Group level, the climate resilience and adaptation program will protect our people and the environments in which we operate, strengthen the decision-making process, mitigate financial losses due to asset damage and business interruption, and ensure adaptation to climate change based on scientific data. In the long term, portfolio changes with the development of our Solutions &amp; Products business line will contribute to a shift to a business model that offers integrated solutions and systems specifically designed to tackle climate change challenges, such as: energy efficiency, cooling effects, extending the longevity of building materials and enhanced options to generate renewable energy.</p>



**RISK DAMAGED ASSETS AND OPERATIONS** CONTINUED**CLIMATE RESILIENCE AND  
ADAPTATION PROGRAM**

Our climate resilience and adaptation program is a series of risk assessment initiatives being rolled out throughout our sites in a phased approach. Bridging short term resilience to long-term adaptation requirements, it will support our decision-making process and reinforce the Group's responses to physical risk. Leveraging the insights arising from this program, the ERM process will begin to integrate the requirements of the TNFD.

**RISK ASSESSMENT  
2022**

- Launch of the multi-functional program covering a large range of current and future natural hazards
- Assessment of 62 sites in 31 countries







**ADAPTATION  
2024 onwards**

- All sites across our business lines in scope
- Integration of the Nature-related risks of the Swiss RE tool in order to expand to Nature
- "Adaptation by design" including in CapEx projects and Due Diligences
- Investment plans to increase long-term adaptation
- Providing financial disclosure under EU Taxonomy

**RESILIENCE  
2023**

- Risk assessment of all cement plants as well as 39 Solutions & Products sites
- Reinforce business continuity procedures
- Definition of climate change adaptation action plans and evaluate needs for investments to mitigate future climate risks

## CLIMATE AND NATURE RISKS AND OPPORTUNITIES CONTINUED

RISK PHYSICAL CLIMATE-RELATED RISKS					
	<p><b>PRECIPITATION/STORM</b></p> <p>Maximum daily precipitation (in mm) for a predefined event. Also included lightning storms.</p>		<p><b>FLOOD</b></p> <p>Includes fluvial, riverine and pluvial floods. The risk score is based on changes in precipitation patterns as well as other components such as topography, catchment area and runoff.</p>		<p><b>LANDSLIDE</b></p> <p>Mass movement processes including rockfall, debris flows and mud slides.</p>
	<p><b>WILDFIRE</b></p> <p>Likelihood of wildfire based on current land susceptibility to fire and projected hot and dry weather.</p>		<p><b>DROUGHT</b></p> <p>Water stress locations based on the Standardized Precipitation Index (SPI) in combination with the number of heat wave days.</p>		<p><b>HEAT</b></p> <p>Combination of atmospheric water capacity, change in extreme temperature, and increase in number of dry days.</p>

● Acute ● Chronic

Temperature Change	IPCC Scenario	2025	2023	2050
1.5–2°C	SSP1-2.6	✓	✓	✓
2–3°C	SSP2-4.5	✓	✓	✓
3–5°C	SSP5-8.5	✓	✓	✓

Shared Socioeconomic Pathways (SSP1-2.6, SSP2-4.5, SSP5-8.5), temperature change by 2100 Intergovernmental Panel on Climate Change

The climate resilience and adaptation program assessed the potential impact of climate hazards at site level and along our supply chains. The study has been carried out based on physical climate risk insights that rely on the latest climate science from IPCC.

Ten risk scores were used to assess the development of climate risks under three different future scenarios (SSP1-2.6, SSP2-4.5, and SSP5-8.5) based on the Intergovernmental Panel on Climate Change's Sixth Assessment Report. The scenarios consider greenhouse gas concentration trajectories in the atmosphere that relate to a 1.5°C–2°C, 2°C–3°C and >4°C increase in the global average surface temperature by 2100 respectively. For each location, changes to acute physical climate hazards such as flood, wind, precipitation and chronic hazards such as heat and drought were assessed for each scenario and the years 2025, 2030, and 2050.

**RISK CONSOLIDATED OVERVIEW OF OUR PORTFOLIO****IMPACTS ON OUR ASSETS**

Considering Holcim' locations to be mostly extraction and processing of raw materials, the perils that can mostly impact business operations are heatwaves, flooding, drought, and extreme precipitation. For SSP1-2.6, the risk of heatwaves will only increase in the equatorial and tropical regions, however under SSP5-8.5 it increases notably everywhere in the future. Despite this, it is expected that most buildings (and machinery operated by people) will be air-conditioned, which mitigates the risk of heat waves causing business interruptions or reduced efficiency. Droughts are expected to increase close to the Mediterranean Sea and Mexico, so water scarcity will increase. Extreme precipitation will increase for about one third of the locations with SSP1-2.6 and for about half of the locations for SSP5-8.5. Climate models indicate that the flood risk will increase moderately by the end of the century for locations already affected by flooding.

**IMPACTS ON OUR SUPPLY CHAIN**

Disruption of supply chains by extreme weather events can pose a significant threat to Holcim's business operations. As a building materials company, Holcim is exposed to high and low water levels and flooding events that can impede planned transportation schedules, since transportation routes may be blocked, or employees may not be able to work as they cope with the flood. This results in business interruptions and additional costs that have already been experienced in many locations where we operate.



RISK PHYSICAL RISK CONTINUED



**AT THE CROSSROAD BETWEEN NATURE AND CLIMATE: WATER RISK**

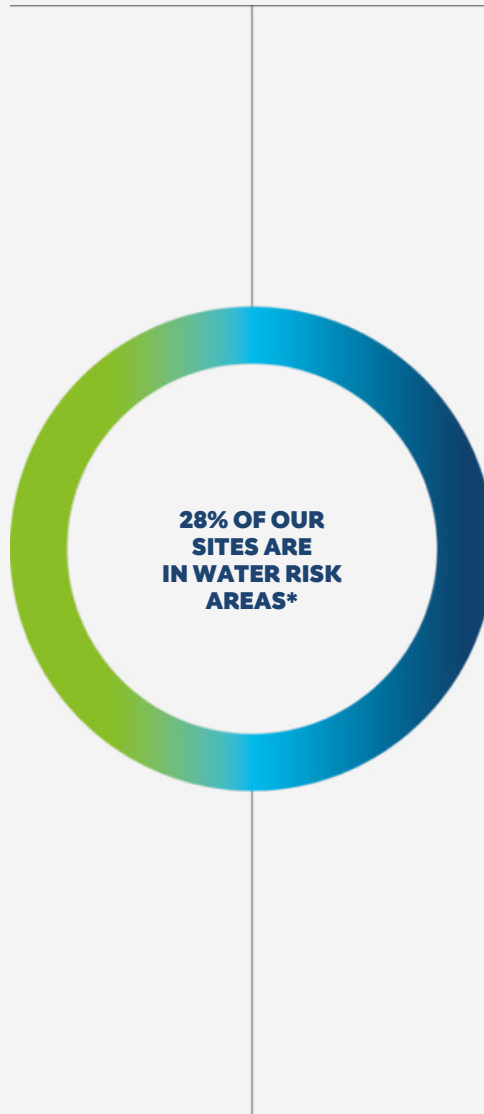
At Holcim, we have developed a range of solutions to respond to water risk, which are adaptable based on local market conditions and water profiles.

**POLICY AND LEGAL**

More stringent regulations on water usage lead to a risk of exceeding freshwater quotas, coupled with increasing community expectations. In the Philippines, this led to a proactive program to reduce freshwater withdrawals by 69 percent since 2018. The compliance of water discharge is ensured by the implementation of Holcim’s Nature Policy, Water Directive and Water Management Standard.

**REPUTATION**

High freshwater withdrawal in areas of water risk could trigger potential negative impacts to our reputation. Reducing freshwater withdrawal is a key part of our strategy. As an example, in Greece, we reduced our freshwater withdrawal by replacing it with waste water from a local drinks company. In Australia, we replaced freshwater withdrawal with rainwater which we harvest and store on our sites when we face extreme rainfall events.



**OPERATIONAL DISRUPTIONS**

In certain areas, our operations can be susceptible to both too much or too little freshwater. In Egypt, we addressed the risk of higher costs or business interruption due to increased water scarcity by commissioning a desalination facility. Conversely, in 2022 and 2023, due to an increased risk of flooding in Bangladesh that would affect the entire economic and social ecosystem, we have taken proactive resilience measures to protect our people and assets as well as enable efficient business continuation.

**SUPPLY CHAIN DISRUPTIONS**

Operating in certain areas may lead us to face adverse supply chain conditions, such as impaired transportation and logistics, especially on fluvial routes during very low (such as the Rhine affecting operations in Germany) or very high (Mississippi) water levels. In the U.S., we’ve implemented a comprehensive response plan which consists of changing the means of transportation and production sourcing, utilizing temporary seasonal floating storage and short-term rail track.

\* Per the World Resources Institute (WRI) Aqueduct tool, “water risk” embraces a large range of risks such as scarcity, flooding, access to drinking water, reputation, etc. Quality of water discharged is also part of our risk-based approach and is fully addressed by our internal policies.

**RISK BUSINESS CASE ON THE PHYSICAL RISK**

<b>APAXCO PLANT,</b> Mexico	<p>The current risk of heat stress is very high. The risk of lightning, drought and heat wave are high, followed by moderate risk of extreme precipitation, earthquake, and windstorm. Additionally, the (fresh)water availability is very low. The climate is modelled to become warmer (by 2080 up to +3.6°C) and dryer (summer and winter precipitation decrease by 2080 up to -23 percent and -77 percent, respectively). Droughts, heat waves, heat stress, and wildfires are expected to increase in the future. The strongest increase is expected for the warmer climate scenarios (SSP2-4.5 and SSP5-8.5).</p>
<b>RICHMOND PLANT,</b> Canada	<p>The current potential loss driving perils are fluvial flood and earthquake with both at high risk. In addition, there is also a very high risk of extreme precipitation, and moderate risk of drought and heat wave. The future climate risk scores indicate that extreme precipitation will increase between 9 and 14 percent by 2080 compared to the present for all climate scenarios. However, the increase of river flooding will be moderate. Heat waves and droughts are also expected to increase especially with SSP5-8.5.</p>
<b>EL SOKHNA,</b> Egypt	<p>The potential loss driving peril is earthquake but in this case with moderate risk. The present exposure to heat stress is very high, and the (fresh)water availability is very low. For the future, it is expected that the risk of wildfire, drought, heat waves and heat stress will increase. Again, there are differences in the future risk between the different climate scenarios with SSP5-8.5 being most impactful.</p>
<b>VOLOS PLANT,</b> Greece	<p>The current potential loss driving peril is earthquake with high risk. Additionally, there is moderate lightening and extreme precipitation risk. Heat stress is rated as a very high risk. The (fresh)water availability is low. The future climate risk scores indicate that heat stress and heat wave will increase especially with the middle of the road (SSP2-4.5) and the warmest climate scenario (SSP5-8.5). For example, heat wave days per year are currently two and will develop by 2050 with SSP2-4.5 to 46 and with SSP5-8.5 to 68. In addition, droughts and wildfires are expected to increase for this location, even if the present risk of both is rated as very low and low, respectively.</p>

## CLIMATE AND NATURE RISKS AND OPPORTUNITIES CONTINUED

### OPPORTUNITY ACCELERATING CIRCULARITY IN CONSTRUCTION

#### Description

Together with reducing our CO<sub>2</sub> footprint, the circular economy represents an important lever to design a business model that offers sustainable financial returns with reduced costs. In addition, preserving natural resources considerably reduces our dependence to mineral resources and preserves our long term growth.

#### Our Response

Circularity is one of our key strategic pillars, making circularity a driver of profitable growth. Circular construction to build new from old is made possible at scale through recycling construction demolition materials (CDM) into new building solutions. We are driving circular construction with solutions to reduce, reuse and recycle materials. We are scaling up Holcim's proprietary ECOCycle technology platform to produce recycled construction aggregates and cement paste to be used to replace limestone in cement manufacturing, therefore helping to decarbonize.

This commitment to circularity extends to our portfolio of roofing solutions. As an example, a standard Malarkey residential roof upcycles at least 3,000 plastic bags into new shingles. Duro-Last roofing solutions also recycle manufacturing waste and roofs at the end of their life through its Recycle Your Roof program.

→ Please refer to pages 38–41 in order to learn how we build new from old and how we embed circularity in our core business model.

### OPPORTUNITY ACCESS TO COMPETITIVE DECARBONIZED ENERGY

#### Description

Shifting to decarbonized sources of energy is at the core of the Group's transformation towards a resilient, circular and sustainable business.

In the medium to long term, our operations decarbonize their energy usage while mitigating continuous pressures on prices and risks to energy security and supply. Access to competitive decarbonized energy will benefit our business encompassing resilience, self-sufficiency, stable energy prices and contribution to our net-zero roadmap.

In the longer term, it is likely that the consumption of electricity will increase with the deployment of new technology for carbon capture and the electrification of industrial processes (ie. kiln electrification), which makes the development of renewable energy sourcing all the more strategic and beneficial for the Group.

#### Our Response

We work continuously to increase the portion of decarbonized energy in our operations with reliable, competitive and decarbonized power. All opportunities are investigated and addressed in order to achieve cost competitiveness as well as sustainable performance.

Our Group is applying a wide range of strategies which differ depending on the local context:

- Increase consumption of decarbonized power from long term power purchase agreements (PPA) produced by either onsite or offsite assets
- Bi-lateral green power contracts directly with producers of decarbonized power to reduce dependency on market movements and have a more decarbonized footprint.
- Investment in renewable power projects and waste heat recovery systems using available space in our plants and quarries.

→ Refer to pages 16–21 in order to learn more how we adopt a tailored, local approach to decarbonize our electricity.

### OPPORTUNITY DECARBONIZING THE BUILT ENVIRONMENT

#### Description

Buoyed by long term trends, climate change will create new needs and new challenges for the construction sector as a whole: need for resilient infrastructure, transformation into a circular economy due to scarcity of resources, growing cities requiring sustainable solutions such as energy efficiency.

Addressing these challenges and decarbonizing building requires the activation of several levers for which the construction and building material industry is a partner of choice. For Holcim, building represents a unique opportunity to contribute to the transition to a low-carbon and circular global economy, while accelerating the transition to highly energy-efficient cities.

#### Our Response

We are decarbonizing building across its lifecycle to build a net-zero future that works for people and the planet. To do so, our large range of solutions help cities curb greenhouse gas emissions with our building solutions that enable a lower carbon footprint, higher energy efficiency and reduced material use. Our Solutions and Products business line offers solutions that help decarbonize cities with a range of roofing, insulation and retrofitting solutions both for new builds and existing building stock. As an example, our insulation systems offer advanced energy efficiency benefits enabling Passive House buildings, such as the Winthrop Center in Boston, U.S.. This includes Holcim's Elevate ISOGARD boards that provide thermal insulation up to 40 percent above competitive products in the market making buildings more energy-efficient and cost-effective in use.

Holcim is raising awareness among mayors and urban planners to evolve building norms and standards and specify smart and sustainable building solutions in public procurement. Our solution Dynamax high performance concrete is an example of how we seize those kinds of opportunities by deploying new building technologies to use minimum material for maximum strength. Useable space is optimized while superior rigidity enables to build longer-lasting buildings.

Developers and end-users are increasingly setting their own rigorous net-zero targets. Holcim supports them by raising awareness of the role that construction materials can play in decarbonizing building, and the need to specify sustainable solutions in procurement, as well as evolving building norms and standards.



**OPPORTUNITY INCREASING DEMAND FOR LOW-CARBON BUILDING SOLUTIONS****Description**

As the economy shifts to a decarbonized paradigm, endorsed by norms and regulations, and supported by a large number of stakeholders and customers, the market demand for low-carbon products will increase. Should Holcim's decarbonization keep pace with the market, it will offer a unique opportunity to deliver profitable growth and the business case for further decarbonization.

**Our Response**

We accelerate the decarbonization of our operations together with the development of a complete offer aimed at meeting customers' product quality and decarbonization expectations. With the strength of global brands such as ECOPact and ECOPlanet, our Group is prepared to seize the evolution of the market and increased demand for low-carbon products. As a global leader in innovative and sustainable building solutions, we engage with a large range of stakeholders and partners to influence norms and regulations and contribute to decarbonize construction, hence fostering a green demand and prepare our Group to capture over-proportional green growth. We closely monitor climate policies and incentives (such as the Buy Clean Initiative in the U.S.) and take advantage of our broad global customer base to target decarbonization first movers and those likely to move in the medium/long term.

## SCENARIO ANALYSIS

Holcim has developed two distinct and plausible climate change scenarios, including one adhering to the Paris Agreement, to test the resilience of the organization's strategy in light of different climate change futures.

In line with the Task Force on Climate-related Financial Disclosures (TCFD) recommendations, Holcim has continued to develop distinct and plausible climate change scenarios to test the resilience of the organization's strategy in light of different climate change futures. Two scenarios have been considered to present Holcim's assessment on climate-related transitional and physical risks. A "Paris Agreement-aligned" scenario (aligned with 1.5°C) and an "Ineffective Collective Action Against Climate Change" scenario (aligned with 3 – 5°C).

The Paris Agreement-aligned scenario is favorable for Holcim, its shareholders and the global community. New market conditions will support growing demand for low-carbon products and solutions, increasing our market share in low-carbon cement and concrete as well as solutions to reduce the emissions of the built environment. Holcim's sustainability leadership brings strategic resilience to the Group, and Holcim is well positioned to build on its net-zero journey and help create a net-zero future that works for people and the planet.

A lower pace of transformation will lead to an "Ineffective Collective Action Against Climate Change" scenario, as the construction value chain continues to be fragmented and stimuli are not yet in place to decarbonize at the pace and scale required. While this is not Holcim's strategic direction, the Group will adapt to cover the market needs while continuing to drive circular and low-carbon construction and invest in less carbon-intensive production technologies.

In all cases, Holcim is well positioned for the future, with its leadership in Ready-mix concrete and the expansion of its Solutions & Products segment. Concrete is versatile, affordable, insulating and infinitely recyclable. In addition, it is resilient, durable, fire and earthquake resistant, protecting our cities and infrastructure from natural disasters. For all these reasons, concrete is a must for climate change adaptation and currently there is no viable substitute at scale.

Simultaneously, Solutions & Products' technologies and innovations deliver sustainable and energy-efficient solutions for the built environment. These will be a must in the coming decades, regardless of the climate change scenario.

This chapter aims to summarize the outcome of Holcim's climate-related scenario analysis. Holcim will continue to develop its climate scenarios analysis to understand emerging opportunities and mitigate potential risks associated with climate change.

Holcim considers the impact of each climate change scenario on our ambition to become a net-zero company by 2050 and a leader in sustainable and innovative construction materials and solutions, thus delivering profitable growth in a low-carbon economy. Depending on the particular risk or opportunity, this assessment leverages both quantitative and qualitative assessments. These scenarios do not constitute definitive outcomes for Holcim. This scenario analysis exercise relies on assumptions that may or may not eventuate, and scenarios may be impacted by additional factors to the assumptions disclosed.

## PARIS AGREEMENT-ALIGNED SCENARIO

In the Paris Agreement-aligned scenario, Governments and industries are aligned to make carbon neutrality possible. The cement industry is making significant efforts toward net-zero development and innovation, while climate change mitigation and adaptation have a growing importance. Carbon capture, utilization and storage technologies are developing at a pace consistent with the industry's transition to net zero. Demand for low-carbon and material-efficient solutions, solutions that reduce the emissions of the built environment, and those that mitigate the impacts of climate change, are accelerating. Physical impacts of climate change are manageable without significant business or societal disruption. Holcim's sustainability leadership brings strategic resilience to the company. Holcim is well positioned to build on its net-zero journey and build a net-zero future that works for people and the planet.

## INEFFECTIVE COLLECTIVE ACTION AGAINST CLIMATE CHANGE SCENARIO

Ineffective collective action against climate change creates a misalignment between our efforts to reach net-zero emissions and the applicable regulations, resulting in a competitive disadvantage that a zero-carbon strategy imposes on our company to other companies and sectors. Limited benefits would be drawn from the development of low-carbon and material and energy-efficient solutions. Physical impacts of climate change are severe including water stress and extreme weather events. Holcim develops a strong response strategy to protect its assets and adapt to new market demand features.

	PARIS AGREEMENT-ALIGNED SCENARIO	INEFFECTIVE COLLECTIVE ACTION AGAINST CLIMATE CHANGE
<b>Temperature range by 2100</b>	1.5°C	3°C – 5°C
<b>Reference Scenarios</b>	IEA net-zero Emissions Scenario (NZE) Source: IEA World Energy Outlook 2023, IEA Net Zero by 2050 (2021, updated in IEA World Energy Outlook 2022)	IEA Stated Policies Scenario (STEPS) Source: IEA World Energy Outlook 2023  IEA Reference Technology Scenario (RTS) Source: IEA Technology Roadmap - Low-Carbon Transition in the Cement Industry (2019)
<b>Carbon Emissions Pathway, IPCC 6th Assessment Report</b> Used for Physical Risk assessment	Carbon Emissions Pathway: SSP1-2.6	Carbon Emissions Pathway: SSP5-8.5
<b>Cement Demand</b>	Trend following NZE: Growth until 2030 in emerging markets. From 2030–2050 demand decreases due to smart design	Trend following RTS until 2030: Growth until 2030 in emerging markets. Marginal growth after 2030
<b>CO<sub>2</sub> price (USD/T CO<sub>2</sub>)</b>	NZE: Advanced economies with net zero pledges: 2030: 140, 2050: 250 Selected emerging markets with net zero pledges: 2030: 90, 2050: 200 Selected emerging markets: 2030: 25, 2050: 180 Other emerging markets: 2030: 15, 2050: 55	STEPS: EU: 2030: 120; 2050: 135 Canada: 2030: 130; 2050: 155 Other selected markets: 2030: 13-42, 2050: 29-89



# SCENARIO ANALYSIS CONTINUED

## SCENARIO IMPACTS

		<span style="color: red;">●</span> Risk to be watched continuously by Holcim and risk governance to be adjusted accordingly to limit negative business impact. <span style="color: green;">●</span> Opportunity improving the conditions to deliver our strategy and having a positive business impact.			
		PARIS AGREEMENT-ALIGNED SCENARIO		INEFFECTIVE COLLECTIVE ACTION	
		RISKS	OPPORTUNITIES	RISKS	OPPORTUNITIES
1. POLICY AND LEGAL					
1.1 CO <sub>2</sub> prices and other climate policies	2030				
	2050				
2. MARKET					
2.1 Access to mineral components	2030				
	2050				
2.2 Cost of fossil fuels/energy	2030				
	2050				
2.3 Circular construction (recycling materials, smart design and driving repair and renovation)	2030				
	2050				
2.4 Demand for low-carbon building materials	2030				
	2050				
3. TECHNOLOGY					
3.1 Decarbonization of supply chain (energy and transportation)	2030				
	2050				
3.2 Deployment of breakthrough technologies at a large scale	2030				
	2050				
4. REPUTATION					
4.1 Impact on Group's stakeholders	2030				
	2050				
5. PHYSICAL					
5.1 Chronic – higher average temperatures and sea level rise	2030				
	2050				
5.2 Acute – extreme events (flooding and heat)	2030				
	2050				

## PARIS AGREEMENT-ALIGNED SCENARIO

## INEFFECTIVE COLLECTIVE ACTION AGAINST CLIMATE CHANGE SCENARIO

**1. POLICY AND LEGAL**

Consistent with our net-zero strategy, reliable and stable carbon prices in all regions facilitates long-term investment decisions in low-carbon technologies and encourages significant changes across the building material and construction value chain. It will also support the collective effort to create a CO<sub>2</sub> transportation and storage network at a large scale in line with the needs of other industries.

A limited number of CO<sub>2</sub> pricing schemes hampers the deployment of breakthrough technologies at the pace needed, making it more challenging for Holcim to deliver on its net-zero target. Also, with fragmented decarbonization efforts in the construction value chain, it is more difficult to benefit from the competitive advantage coming from a low-carbon footprint.

**2. MARKET**

While decarbonization of the construction value chain progresses, focus is on reducing operational emissions in the built environment, and circular construction is progressively endorsed by norms and regulations globally. This results in a higher demand of low-carbon and circular building materials and of our Solutions & Products segment. Simultaneously, as the steel and energy industry decarbonize, the availability of supplementary materials such as fly ash or slag decreases. Holcim mitigates this risk by securing sources of limestone, construction demolition materials or byproducts from other industries but also by investing in calcined clay facilities and developing novel cements with new binders. By the progressive transition to decarbonized energy sources, Holcim's dependency on fossil fuel decreases.

As there are few regulatory incentives to use low-carbon products and to recycle, there is a limited increase in the sales of our low-carbon cement and concrete. The demand of our circular materials and our products and solutions will be driven by urbanization, the need to protect natural resources, and increased fossil fuel prices. By 2030, while the average clinker factor reduces moderately, the availability and costs of mineral components will remain virtually unchanged compared to today's levels. By 2050, the price of these materials timidly increases as some decarbonization of industries is underway leading to a limited negative impact. On the other hand, with the slower transition to decarbonized energy sources, the demand for fossil fuels remains strong.

**3. TECHNOLOGY**

Holcim will benefit from the overall decarbonization efforts in society due to a) the earlier readiness and affordability of breakthrough technologies, such as kiln electrification, hydrogen and most importantly CCUS; and b) efforts in our own value chain / suppliers, which will reduce our Scope 3 emissions. Additionally, we will expect the production of supplementary cementitious materials like calcined clay to mature.

Significant additional efforts will be needed from Holcim to reach its Scope 1 targets as governments are slow in implementing the necessary policies to scale up breakthrough technologies such as kiln electrification, hydrogen and CCUS and the network and infrastructure around it. Scope 3 targets are challenged as suppliers do not decarbonize at the necessary pace.

**4. REPUTATION**

In the short term, Holcim's cement production segment remains in the spotlight as a CO<sub>2</sub> intensive business, bringing reputational risks. However, as the net-zero roadmap is delivered and Holcim is seen as a keen contributor to mitigate climate change, its reputation, trust and credibility grows and the strategy is aligned with the expectations of the stakeholders.

The slow pace in required regulatory incentives will bring additional challenges to Holcim's decarbonization journey, increasing progressively the respective reputational risks.

**5. PHYSICAL**

Extreme precipitation and flooding impacting sites and supply chains in affected areas will require further protective measures and mitigation plans. Today, 30 percent of our sites are located in areas with medium to extremely high water stress, which explains why appropriate governance and management in water consumption, recycling and treatment are already required today.

Extreme weather events like extreme precipitation, flooding, drought and excessive heat days will increase significantly in frequency and intensity. In the long term, these may be significantly more intense and make protection measures at existing locations insufficient. This could have severe financial impacts on sites and supply chains and could potentially jeopardize the economic viability of some of our operations. Further risks, such as wildfire and windstorms, will increase and become significant threats. An opportunity is present with the development of our Solutions & Products business line which offers integrated solutions and systems specifically designed to tackle climate change challenges by increasing energy efficiency, providing cooling effects, extending the longevity of building materials and enhancing options to generate renewable energy.



# PERFORMANCE DATA TABLES



Part of Amazon's global headquarters, the Seattle Spheres, built with ECOPlanet, are home to more than 40,000 plants from the cloud forest regions of over 30 countries



## PERFORMANCE AGAINST TARGETS

### Unit key

Mt – million tons	Mm <sup>3</sup> – million cubic meters	kgCO <sub>2</sub> /t – kilograms of carbon dioxide per ton	# – number	g/t – grams per ton
M GJ – million gigajoules	CHF – Swiss Francs	L/t – liters per ton	ha – hectares	mg/t – milligrams per ton
MJ – million joules	NR – Not reported	L/m <sup>3</sup> – liters per cubic	CHFm – million Swiss francs	LTI – Lost Time Injuries
MJ/t – million joules per ton	% – percentage		ton – metric ton	

	Unit	Base Year	Baseline	Target	Target Year	Current Performance	Achieved to Date
Specific CO <sub>2</sub> emissions - Net (Scope 1) - Cement only	kgCO <sub>2</sub> /t	2018	590	420	2030	545	-7.6 %
Specific CO <sub>2</sub> emissions - Gross (Scope 1) - Cement only	kgCO <sub>2</sub> /t	2018	623	-23.30 %	2030	587	-5.8 %
CO <sub>2</sub> emissions - electricity (Scope 2) - Cement only	kgCO <sub>2</sub> /t	2018	46	-65.00 %	2030	36	-22.7 %
CO <sub>2</sub> indirect emissions from purchased fuels (Scope 3)	kgCO <sub>2</sub> /t purchased fuels	2020	286	-20.00 %	2030	283	-1.1 %
CO <sub>2</sub> indirect emissions from purchased clinker and cement (Scope 3)	kgCO <sub>2</sub> /t per ton CLC	2020	710	-25.10 %	2030	702	-1.2 %
CO <sub>2</sub> indirect emissions from downstream transportation (Scope 3)	kgCO <sub>2</sub> /t per ton transported	2020	10.8	-24.30 %	2030	8.6	-20.2 %
Cement Specific freshwater withdrawal	L/t	2018	377	-33.00 %	2030	298	-21.0 %
Aggregates Specific freshwater withdrawal	L/t	2018	225	-20.00 %	2030	192	-14.6 %
Ready-Mix Specific freshwater withdrawal	L/m <sup>3</sup>	2018	212	-15.00 %	2030	206	-3.0 %
Waste derived resources - all segments	Mt	2018	n/a	TBC	2030	36.3	
Construction demolition materials (CDM)	Mt	2020	6.6	12	2030	8.5	1.9
Circularity ratio - Cement (waste used / production volumes)	%	2020	22	30	2030	21.6	-0.4
Recycling ratio - all segments (waste used / sales volumes)	%	2020	8.5	17	2030	7.2	-1.3
High ESG impact suppliers qualified (% spend)	%	2017	n/a	100 %	2022	93	
Specific dust emissions	g/t	2018	121	75	2030	64.1	-56.9
Specific NOx emissions	g/t	2016	1,513	1,100	2030	1,188.6	-324.5
Specific SO <sub>2</sub> emissions	g/t	2016	357	230	2030	229.7	-127.3
Cumulative contribution to create positive social impact	CHFm	2021	n/a	350	2030	90.8	26 %

## PERFORMANCE DATA TABLES

### ENVIRONMENT

#### ENERGY<sup>1</sup>

	Unit	2021	2022	2023
Energy consumption total	M GJ	437	431	420
Thermal energy consumption	M GJ	384	376	367
Thermal energy consumption fossil fuels – coal	M GJ	87	71	54
Thermal energy consumption fossil fuels – petcoke	M GJ	79	78	79
Thermal energy consumption fossil fuels – oil	M GJ	30	29	29
Thermal energy consumption fossil fuels – gas	M GJ	90	94	98
Thermal energy consumption fossil fuels – other traditional fossil fuels	M GJ	8	8	7
Thermal energy mix of clinker production – alternative fuels (ex biomass)	M GJ	58	61	62
Thermal energy mix of clinker production – biomass	M GJ	32	34	38
Electrical energy consumption	M GJ	54	55	52
Electrical energy – own generation – renewable	M GJ	1	1	1
Electrical energy – renewable PPAs	M GJ	2	3	3
Electrical energy – other renewable (grid)	M GJ	8	10	10
Electrical energy (non-renewable)	M GJ	42	41	38

<sup>1</sup> 2021 data is restated as per 2023 Consolidation

## ENVIRONMENT

**ABSOLUTE GHG EMISSIONS<sup>1</sup>**

	Unit	2021	2022	2023
Absolute Scope 1 emissions – gross	Mt	81	78	75
Absolute Scope 2 emissions (market-based)	Mt	5	5	5
Absolute Scope 3 emissions – total	Mt	53	47	47
Absolute S3 emissions – Cat 1 – Purchased goods & services	Mt	9.1	9.0	8.3
Absolute S3 emissions – Cat 2 – Capital goods	Mt	0.1	0.1	0.2
Absolute S3 emissions – Cat 3 – Fuel and Energy	Mt	5.8	5.5	5.3
Absolute S3 emissions – Cat 4 – Upstream transportation & distribution	Mt	4.6	4.7	4.4
Absolute S3 emissions – Cat 5 – Waste generated in own operations	Mt	0.2	0.1	0.1
Absolute S3 emissions – Cat 6 – Business travel	Mt	0.0	0.0	0.0
Absolute S3 emissions – Cat 7 – Employee commuting	Mt	0.1	0.1	0.1
Absolute S3 emissions – Cat 8 – Upstream leased assets	Mt	0.1	0.1	0.1
Absolute S3 emissions – Cat 9 – Downstream Transportation & distribution	Mt	2.6	2.6	2.2
Absolute S3 emissions – Cat 10 – Processing of sold products	Mt	2.3	1.5	1.9
Absolute S3 emissions – Cat 11 – Use of sold products	Mt	0.0	0.0	0.0
Absolute S3 emissions – Cat 12 – End of life treatment of sold products	Mt	1.0	1.0	1.4
Absolute S3 emissions – Cat 13 – Downstream leased assets	Mt	0.0	0.0	0.0
Absolute S3 emissions – Cat 14 – Franchises	Mt	0.1	0.0	0.0
Absolute S3 emissions – Cat 15 – Investments	Mt	27.0	22.5	23.1
Absolute emissions (Scope 1, 2 & 3)	Mt	139	131	127

**ABSOLUTE SCOPE 1 EMISSIONS BY SOURCE<sup>1</sup>**

	Unit	2021	2022	2023
CO <sub>2</sub> emissions – Gross (Scope 1)	Mt	81	78	75
CO <sub>2</sub> emissions from raw materials	Mt	52	51	49
CO <sub>2</sub> emissions from fossil fuels	Mt	24	22	21
CO <sub>2</sub> emissions from alternative fuels (non-biomass)	Mt	5	5	5
CO <sub>2</sub> emissions from alternative fuels (biomass)	Mt	4	3	4

**ABSOLUTE SCOPE 1 EMISSIONS BY REGION<sup>1</sup>**

	Unit	2021	2022	2023
CO <sub>2</sub> emissions – Gross (Scope 1) – Asia Middle East & Africa	Mt	31	29	28
CO <sub>2</sub> emissions – Gross (Scope 1) – Europe	Mt	23	22	20
CO <sub>2</sub> emissions – Gross (Scope 1) – LATAM	Mt	11	11	11
CO <sub>2</sub> emissions – Gross (Scope 1) – North America	Mt	16	16	16

**SPECIFIC SCOPE 3 EMISSIONS<sup>1</sup>**

	Unit	2021	2022	2023
CO <sub>2</sub> indirect emissions from purchased fuels	kgCO <sub>2</sub> /t purchased fuels	314	285	283
CO <sub>2</sub> indirect emissions from purchased clinker and cement	kgCO <sub>2</sub> /t CLC	706	709	702
CO <sub>2</sub> indirect emissions from downstream transportation	kgCO <sub>2</sub> /t transported	10	10	9

**ENERGY & GHG (GCCA KPIS) – CEMENT PLANTS ONLY**

	Unit	2021	2022	2023
Specific CO <sub>2</sub> emissions – Net (Scope 1) <sup>2</sup> – as reported	kgCO <sub>2</sub> /t	553	562	545
Specific CO <sub>2</sub> emissions – Net (Scope 1) – 2023 Consolidation	kgCO <sub>2</sub> /t	572	562	545
Specific CO <sub>2</sub> emissions – Gross (Scope 1) <sup>3</sup> – as reported	kgCO <sub>2</sub> /t	581	602	587
Specific CO <sub>2</sub> emissions – Gross (Scope 1) – 2023 Consolidation	kgCO <sub>2</sub> /t	609	602	587
Specific CO <sub>2</sub> emissions – Electricity (Scope 2) – market based – as reported	kgCO <sub>2</sub> /t	34	37	36
Specific CO <sub>2</sub> emissions – Electricity (Scope 2) – market based – 2023 Consolidation	kgCO <sub>2</sub> /t	39	37	36
Specific heat consumption of clinker production – as reported	MJ/t	3,520	3,654	3,664
Specific heat consumption of clinker production – 2023 Consolidation	MJ/t	3,640	3,654	3,664
Thermal Substitution Rate (TSR): alternative fuels plus biomass – as reported	%	21	28	30
Thermal Substitution Rate (TSR): alternative fuels plus biomass – 2023 Consolidation	%	26	28	30
Thermal Substitution Rate (TSR): biomass – as reported	%	8	10	11
Thermal Substitution Rate (TSR): biomass – 2023 Consolidation	%	9	10	11

<sup>1</sup> 2021 data is restated as per 2023 Consolidation.

<sup>2</sup> Reported as kg/t cementitious material. See note 10 for the definition of cementitious material.

<sup>3</sup> Gross CO<sub>2</sub> emissions are the total emissions resulting from the calcination of limestone and the emissions resulting from the burning of fossil-based fuels and pre-treated waste-derived fuels. Compared with gross CO<sub>2</sub> emissions, net CO<sub>2</sub> emissions do not include CO<sub>2</sub> from alternative fuels.





**About this document**

Holcim's 2023 Climate Report is fully integrated in the [2023 Integrated Annual Report](#), based on Holcim's commitment to transparency and environmental responsibility.

## ABOUT HOLCIM

Holcim is a global leader in innovative and sustainable building solutions with net sales of CHF 27.0 billion in 2023. Driven by our purpose to build progress for people and the planet, our 63,448 employees are on a mission to decarbonize building, while improving living standards for all. We empower our customers across all regions to build better with less, with a broad range of low-carbon and circular solutions, from ECOPact and ECOPlanet to our circular technology platform ECOCycle®. Through innovative systems, from Elevate roofing to PRB insulation, Holcim makes buildings more sustainable in use, driving energy efficiency and green retrofitting. With sustainability at the core of our strategy, we are on the way to becoming a net-zero company with 1.5°C targets validated by SBTi.

More information is available on [holcim.com](https://www.holcim.com)

## INTEGRATED REPORTING

This Climate Report is also integrated within Holcim's [2023 Integrated Annual Report](#), which shows how we manage the company sustainably, as well as the financial and non-financial value we created in 2023.



For TCFD-guided disclosures see page 66.



DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

In 2022, the SBTi validated Holcim's 2030 targets as aligned with a 1.5°C scenario.

## PHOTO CREDITS

Cover: ONLY FRANCE / Alamy  
Inside Cover: David Küenzi, Studio NAARO, Philippe Piraux  
Page 1: Jack Parsons  
Page 4–5: David Küenzi  
Page 18: Sonder Quest  
Page 34: Roman Keller  
Page 35: Massachusetts Institute of Technology  
Page 35, 41: Block Research Group  
Page 36: OFB Projektentwicklung / KSP Jürgen Engel Architekten  
Page 36: Atelier WOA  
Page 37: Kurt Hörbst  
Page 37, 56: 14Trees  
Page 38–39: Studio NAARO  
Page 43: Lamda Development  
Page 44: Julien Champolion / polaRYSE  
Page 45: Georgia Schofield / polaRYSE  
Page 46–47: Philippe Piraux  
Page 63: The Wub

## IMPRINT

Concept/Design:  
Brunswick Group Advisory Ltd,  
London/U.K.  
[brunswickgroup.com](https://www.brunswickgroup.com)  
Design/Realization:  
Created with Workiva platform  
Linkgroup AG, Zurich/CH  
[linkgroup.ch](https://www.linkgroup.ch)

**Holcim Ltd**  
Grafenauweg 10  
6300 Zug  
Switzerland

**[holcim.com](https://www.holcim.com)**