THE FUTURE OF SUSTAINABLE CONSTRUCTION Building NextGen Cities



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magine the city of the future, with stateof-the-art buildings, infrastructure and industry built sustainably with people's social and economic wellbeing top of mind. A city full of greenery and biodiversity – to ensure quality of life and resilience and harmony with nature.

The good news? All of this is possible now, as forward-thinking cities pioneer transformative solutions to the challenges of our century.

With our vision to be the leading partner for sustainable construction, Holcim sees five opportunities to build the NextGen cities of the future, enabled by our sustainable building solutions, and building progress for people and the planet.

5 CORE OPPORTUNITIES

FOR NEXTGEN CITIES

- #1 SUSTAINABLE BUILDING
- #2 SCALING CIRCULAR CONSTRUCTION
- #3 INCREASING ENERGY EFFICIENCY
- **#4** NATURE-POSITIVE AND RESILIENT CITIES
- #5 SMART DESIGN AND DIGITAL

Let's partner across the building value chain to shape the future of construction together!

Cover picture: CityLife in Milan, Italy. Built with Holcim inside.



THE FUTURE OF SUSTAINABLE CONSTRUCTION

BY MILJAN GUTOVIC, CEO HOLCIM

apid urbanization driven by population growth is among the powerful megatrends transforming how we build. The world is adding a city the size of Madrid every single week - and will do so for decades to come. To meet this demand sustainably, a collaborative, systems-thinking approach to construction is needed.

As the leading partner for sustainable construction, Holcim is driving change. We engage with key decision makers across the building value chain including public authorities and urban planners, architects and engineers, developers and contractors. Our like-minded partners come to us for our comprehensive product offering and end-to-end building systems.

Together, we are creating the sustainable, resilient cities of tomorrow.

Our EPD-certified ECOPlanet cement and ECOPact concrete enable green building standards like LEED and BREEAM, and are already being used to build sustainable cities. From 2030, we will offer more than 8 million tons of near-zero cement per year.

The shared opportunity to build sustainably is still in its early stages. Take circular construction, where Holcim can already make concrete that is 100% recyclable, using our ECOCycle circular technology. Not only does this save on primary materials, it also promotes efficient and circular use of resources with locally used materials made for easy use and recycling. This is why we are opening recycling centers in the metropolitan areas where we operate to build cities from cities.

Energy-efficient repair and refurbishment is also essential to reshape our cities. Buildings in use account for 70% of the construction sector's CO₂ emissions - generated from heating, cooling and power - and some 80% of buildings will still exist in 2050. Supported by new regulations and incentives, we can prolong their lifespans while significantly improving energy efficiency.

Significant benefits include enhanced thermal and sound insulation enabling better quality of life. Holcim also supports cities worldwide with innovative retrofitting and renovation solutions. These range from energy-efficient insulation from Airium and high-performance roofing from ZinCo through to PRB External Thermal Insulation Composite Systems (ETICS).



Miljan Gutovic, CEO Holcim

As cities grow, they are doing so differently. We are seeing a significant rise in prefabrication and modular construction, where offsite production enhances onsite productivity. The result is greater construction efficiency, with cost reductions alongside enhanced quality. One great example is the precast concrete solutions Holcim offers for the most ambitious infrastructure projects.

In the face of climate change, Holcim has sustainable, resilient solutions to withstand extreme weather and mitigate environmental impacts. These include green roofing systems by ZinCo that reduce the urban heat island effect while bringing nature into cities, Hydromedia water-permeable concrete to reduce flooding risk and recharge groundwater, and Basalton concrete blocks for long-lasting coastal protection.

Finally, digital automation and smart design is superseding traditional construction methods. Applications of Artificial Intelligence, such as Building Information Modelling (BIM), are revolutionizing urban planning. At the same time, the Internet of Things and digital twins are making building safer and more efficient, with improved cost management and reliability, while Holcim+ provides AI-enabled ordering and delivery.

At Holcim, we're committed to partnering across the value chain to advance the future of sustainable construction with our high-value, end-to-end Building Materials and Building Solutions – from foundations and flooring to walling to roofing.

I hope these pages will inspire you. Let's build the NextGen cities of the future together!





#1
SUSTAINABLE
BUILDING

o build the sustainable, resilient cities of tomorrow, forward-looking city leaders are transforming how they construct our urban environments – significantly reducing the carbon "embodied" in the materials used, from extraction to manufacturing and construction.

Cities are increasingly using sustainable building solutions that deliver 100% performance with a lower carbon footprint, and that use fewer primary materials. For example, Holcim's ECOPact low-carbon concrete reduces embodied carbon emissions by at least 30% compared to standard concrete without offsets.

Solutions such as ECOPact are also backed by Environmental Product Declarations (EPDs), which independently verify claims on everything from the construction phase to use and end-of-life scenarios to meet the ambitious sustainability goals of city-shaping projects.

Holcim can even provide digital, on-demand EPDs within minutes for any existing and future concrete mixes, for any project, at any stage. This third-party verified data allows us to work with customers from tender through to design and construction, to optimize mixes and report on sustainability performance.

At the same time, cities can explore the latest solutions for sustainable construction to help meet their climate neutrality goals. At Holcim, we constantly innovate to develop low-carbon or near-zero carbon building solutions, and will be able to offer over 8 million tons of near-zero cement each year by 2030.

UNLOCKING ZERO BY REINVENTING CONCRETE

At Holcim we are innovating in concrete – a vital urban building block due to its strength, durability and versatility – to make it net zero and enable sustainable construction at scale across the world, from Zurich to Dubai and Mexico City to Melbourne.

We offer the world's broadest ranges of low-carbon concrete with ECOPact and low-carbon cement with ECOPlanet, enabling our customers to achieve the most advanced sustainability certifications from LEED and BREEAM to WELL.

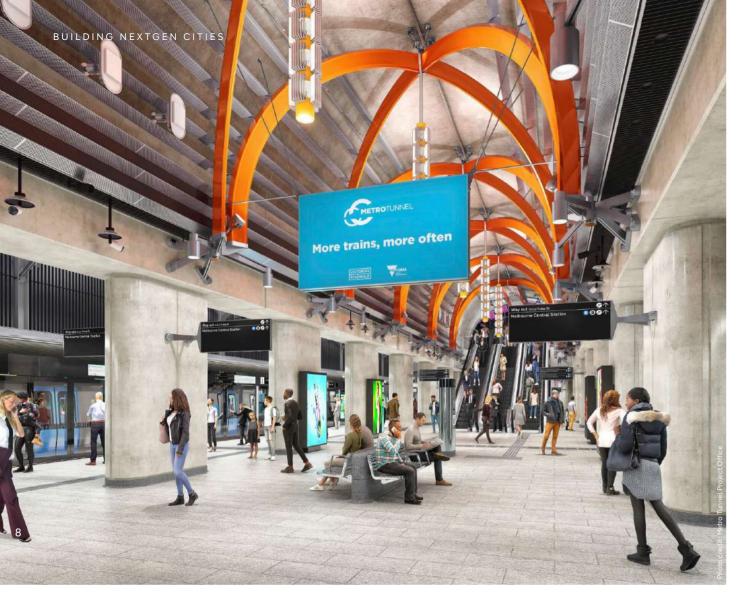
ECOPLANET

FAST FACT

ECOPact concrete delivers 100% performance offering at least 30% lower CO₂ emissions compared to standard concrete using CEM 1. It significantly reduces embodied carbon emissions in NextGen cities.

SQUARE, St. Gallen, Switzerland.

Built with ECOPact and ECOPlanet inside.



MELBOURNE METRO TUNNEL

MELBOURNE, AUSTRALIA

Melbourne's Metro Tunnel is a transformational city project that involves building a new line and five new stations. Built using over 600,000 m³ of Holcim's low-carbon concrete in the project's first five years, it will create room for 500,000 more passengers a week, and support the city's goal to be zero carbon by 2040.

Read more:





BIOCHAR TECHNOLOGY

VENICE, ITALY

During the 2025 Architecture Biennale in Venice, Holcim partnered with ELEMENTAL to present the world's first application of a new biochar technology that turns buildings into carbon sinks. Biochar, a charcoal-like material that sequesters carbon, was used to create a special net-zero* concrete for a resilient housing prototype. We are running pilots using this technology in different countries, to help our customers meet their sustainability ambitions, with no compromise in performance.

Read more:



* Scope of concrete production phases (A1-A3 cradle to gate) in Life Cycle Assessment. Assumes average transportation distance of 300km for cement and filler & 100km for aggregates.



"Holcim's new decarbonization technology allows us to address the scale and speed of the housing crisis' demand, without putting a strain on the environment."

Alejandro Aravena, Founder, ELEMENTAL





BUILDING NEXTGEN



s populations grow and people move to urban areas, the world is building the equivalent of Madrid every week. To construct the buildings, infrastructure and industry that we all need in a way that works for people and the planet, cities across the world have an opportunity to accelerate circular construction.

Circular construction reimagines how urban spaces are designed, built and decommissioned. At its core, it keeps materials in use for as long as possible and designs for disassembly at city level - integrating resource efficiency across the lifecycle of a project, which can then be reused or recycled.

Holcim has set a target of recycling over 20 million tons of construction demolition materials (CDM) by 2030. In key metropolitan areas worldwide, we are working with cities to accelerate circular construction and upcycle CDM into sustainable building solutions using our ECOCycle circular technology.

CIRCULAR BUILDING SOLUTIONS

At Holcim, we are scaling circular construction to build cities from cities and reduce use of primary materials. ECOCycle, our proprietary circular technology, recycles CDM into new building solutions:

- → All products with ECOCycle inside - cement, concrete or aggregates contain from 10% to 100% recycled construction demolition materials.
- ECOCycle also enables the upcycling of decarbonized cement paste from construction demolition materials into new, low-carbon materials.

ECCCYCLE

THE **BOTTOM** LINE

Through urban mining we can transform waste into valuable resources and build cities from cities. Circular construction is an opportunity we can seize. For example, some countries in the European Union do not recycle over 90% of construction demolition materials.







RECYGÉNIE

PARIS, FRANCE

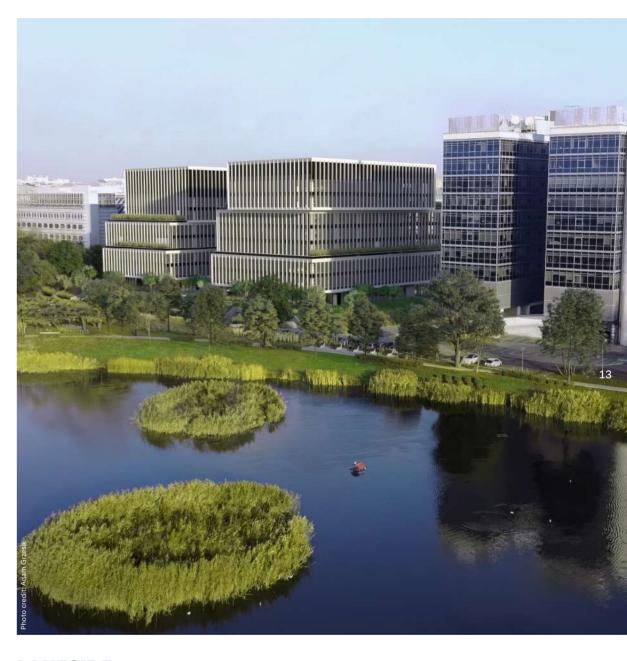
Recygénie housing complex in Paris, France with ECOCycle, is the world's first building built using fully recycled concrete. 6,000 tons of primary materials were saved, and the project won the 2023 Reuters Responsible Business Award for Circular Transition.

Read more:



"We chose Holcim because they were the only ones who considered the possibility of a 100% recycled building. They developed a solution that would allow us to develop a real estate project using fully recycled concrete."

Noémie Bernard, Director of Planning and Architecture, Segens



LAKESIDE

WARSAW, POLAND

The Lakeside office complex in Warsaw, Poland, was built using ECOPact low-carbon concrete. This contains cement that uses recycled mineral insulation wool recovered from construction demolition materials as a limestone substitute.



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#3 INCREASING ENERGY EFFICIENCY

nergy used to power, heat and cool buildings is responsible for up to 80% of CO₂ emissions in cities. By designing and retrofitting buildings with thermal insulation and advanced roofing systems to improve energy efficiency, there is a unique opportunity to speed up the transition to NextGen cities of the future.

With 80% of current buildings and infrastructure still expected to be in use by 2050, the market for energy-efficient repair and refurbishment is thriving. Cities can offer incentives and regulation to further encourage it and extend the lifespan of existing structures for as long as possible.

Here too, Holcim stands ready to support the cities of the future, with energy-efficient solutions for new projects and existing buildings that reduce energy consumption throughout the building lifecycle.

KEY TAKEAWAY

The market for energy-efficient repair and refurbishment is worth EUR 250 billion per annum in the European Union alone.

LES TRÈFLES

ANDERLECHT, BELGIUM

Les Trèfles school in Anderlecht, Belgium, is built following the passive house approach, a model for sustainable design and superior energy performance. Elevate's UltraPly™ TPO roofing system provides maximum energy efficiency and provides a durable foundation for a 7000 m² green roof.

Read more:



AL WASL TOWER DUBAI, UAE Dubai's Al Wasl Tower is being built using Airium, our innovative mineral insulating foam that will improve the building's energy efficiency and simplify construction systems and processes.

ADVANCED ROOFING AND INSULATION SYSTEMS

With the leading brands Elevate and ZinCo, Holcim provides a wide range of energy-efficient high-performance and green roofing systems – both for new buildings and repair and refurbishment.

→ The single-ply roofing membranes such as Elevate's EPDM and TPO provide long-lasting waterproofing, enable green and solar roofs, and offer advanced energy-efficiency benefits that help buildings meet passive house standards.



→ Green roofs remove heat from air, and by acting as insulation, reduce a building's cooling and heating needs. ZinCo's green roofing systems – standard green roofs, roof gardens, retention green roofs and green roofs with solar – enhance cities' resilience and people's wellbeing.



→ Made of up to 95% air, Airium is an extremely lightweight mineral-based insulating foam. For both new builds and green retrofits, it is 100% recyclable, fire resistant and durable, and can be used in roofs, walls, floors and terraces, as well as inside concrete blocks.

AIRIUM

→ PRB External Thermal Insulation Composite Systems (ETICS) are multilayer insulation solutions applied to a building's exterior surfaces that improve energy efficiency and reduce heat loss by 20-30%. Green roofs remove heat from the air, and can reduce surface temperatures by 30-40% compared to conventional roofs. By acting as insulation, they can reduce a building's cooling and heating needs, as well as bring nature into cities and allow biodiversity to thrive, while providing stormwater management.

With the Elevate and ZinCo brands, Holcim provides a wide range of energy-efficient, high-performance and green roofing systems. These support cities' resilience and sustainability aspirations, and suit both new buildings and renovation and refurbishment projects.

5 REASONS GREEN ROOFS RULE

- 1 REDUCE THE URBAN HEAT ISLAND EFFECT
- 2. DRAMATIC COOLING
 AND ENERGY SAVINGS
 FOR BUILDINGS
- 3 ENHANCE URBAN BIODIVERSITY
- 4 EFFECTIVE STORMWATER MANAGEMENT
- 5. IMPROVE AIR QUALITY AND CARBON SEQUESTRATION







NATURE-POSITIVE AND RESILIENT CITIES Rising sea levels, flooding, extreme temperatures. Our climate is changing and it is essential that our homes, schools and other vital infrastructure are resilient enough to cope. At the same time, bringing nature into cities helps ensure biodiversity and improve wellbeing.

Serving as a major carbon sink, the land and oceans absorb more than half of all greenhouse gas emissions. Nature helps keep our cities cooler during heat waves, and serves as a natural storm water management system during periods of heavy rainfall.

Holcim's building solutions can help cities become more sustainable and resilient. By combining advanced materials with nature-positive solutions – including green roofs, permeable concrete that absorbs rainfall and shore protection systems – they equip cities to better withstand climate impacts and improve people's quality of life, now and in generations to come.

BUILDING WATER-WISE CITIES

Floods are the most destructive of natural disasters, damaging property, critical public infrastructure and displacing people. Holcim offers a wide range of innovative solutions to avoid flooding and improve cities' water management capabilities:

Hydromedia permeable concrete rapidly absorbs rainwater off streets, parking surfaces, driveways and walkways – reducing flooding risk. It enables ultra-rapid evacuation of water directly into the soil, producing a natural aquifer recharge or allowing the water to be recycled.

HYDROMEDIA

Holcim's precast stormwater management solutions include drainage, detention, treatment, harvesting and reuse systems, such as Humes' HumeFilter Universal Pollutant Trap (UPT).



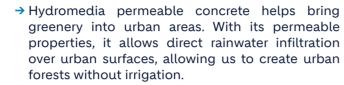
Elevate's EPDM lining solutions, such as GeoSmart and PondEasy, are designed for water storage and usage.



CREATING COOL, GREEN CITIES

Green spaces in cities provide numerous benefits including improved air quality, a reduced heat island effect, improved mental and physical health and more biodiversity. Holcim's range of innovative solutions are helping cities create green spaces to make them more liveable.

→ Green or vegetative roofs help control temperatures and combat the urban heat island effect. ZinCo is a global leader in advanced green roofing systems with many spectacular projects worldwide. Elevate EPDM and TPO roofing membranes offer a reliable and durable foundation for green roof applications.



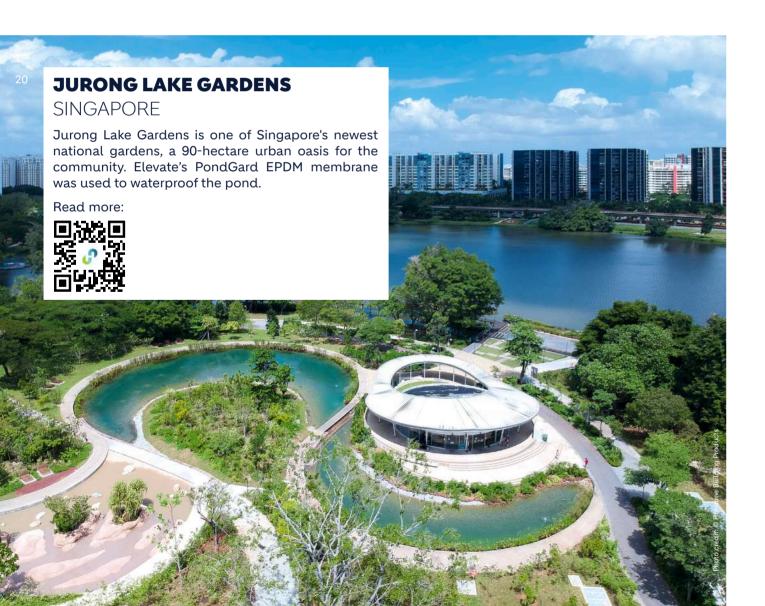
HYDROMEDIA

→ Artevia decorative concrete has a highly reflective coloring, to increase the albedo quality of the surface and reduce the heat island effect.

ARTEVIA









FOSTERING BIODIVERSITY WITH GREEN ROOFS

Birds use green roofs as a stopover habitat during migration and a foraging habitat during the breeding season, helping to mitigate the loss of habitat due to increasing urbanization. They also provide a good forage source for bees and other important pollinators.

→ ZinCo and Elevate green roofing systems can host complex ecosystems with trees, plants and irrigation.

"The Casa d'en Xifré building's value has increased, it is sound and thermally insulated, it stores water, reduces pollution, promotes urban agriculture and social interaction."

Sergio Carratalá, Founder, MataAlta Design Studio, on use of ZinCo and Elevate roofing systems







BUILDING NEXTGEN CITIES

NATURE-POSITIVE AND RESILIENT CITIES



REDUCING AIR POLLUTION TO BREATHE EASY

Due to their high population density, industry and transport – cities suffer the most from air pollution, which impacts health and the environment.

Holcim has an innovative new draining and depolluting concrete that can help transform urban landscapes.

→ Hydromedia with air-enhancing technology contains special additives to remove pollutants from the air, such as nitrogen oxides.

HYDROMEDIA

RESTORING MARINE ECOSYSTEMS: A NEW WAVE

Marine habitats have suffered damage due to climate change and pollution.

→ Our CO₂-reduced Xstone blocks with bioactive concrete are being used to build marine and coastal ecosystems, including artificial reefs, for colonization by marine flora and fauna. 3D printing also contributes to building these reefs faster and more efficiently.

Holcim donated and installed a 24 m² artificial reef to the city of Kiel, which included 3D-printed elements as well as 400 low-carbon, bioactive concrete Xstone blocks, several of which also contain biochar and are net-zero*, to revitalize a former marine munition dumpsite.

"Such innovative projects demonstrate how sustainable coastal protection and nature conservation can go hand in hand. This is an important step for the preservation of our marine habitats."

Alke Voss, Kiel's Environmental Officer

* Scope of concrete production phases (A1-A3 cradle to gate) in Life Cycle Assessment. Assumes average transportation distance of 175km for cement and filler & 165km for aggregates.

A BLUEPRINT FOR COASTAL RESILIENCE

By 2025, 410 million people in coastal communities could be at risk of coastal flooding and rising sea-levels. Holcim offers resilient solutions for the coastal engineering, river protection and infrastructure construction segments.

- → Our Basalton shore protection system for coast and revetment areas provides stabilization and erosion control.
- → Xbloc is a coastal breakwater armor system using Holcim low-carbon concrete solutions such as ECOPact, which also incorporates recycled construction demolition materials.

ECOPACT





Artificial reef donation, Kiel, Germany

Read more:





Basalton Quattroblock revetment, Nieuwekerk, The Netherlands





#5
SMART
BLECIAND

DESIGNAND DIGITAL dvancing digital automation and smart design will be vital as we build the cities of the future. An urban planning revolution has just begun, with artificial intelligence and Building Information Modeling (BIM) allowing us to use generative design to plan more sustainable, optimized urban landscapes.

At the same time, smart design allows for more accurate planning and optimized resource use, unlocking significant CO₂ and material savings using technologies ranging from 3D printing and carbon prestressed concrete (CPC) to modular construction.

Cities around the world can benefit from these innovative technologies – which are making sustainable construction more accessible and effective than ever before – for buildings, infrastructure and industry.

TAKE CONTROL WITH EASE



HOLCIM+ is an intuitive, AI-powered platform dedicated to cement, aggregates and asphalt. Empowering our customers to take control, it makes it easier than ever before to manage orders, deliveries and projects with transparency and efficiency at every step.



Read more:



DID YOU KNOW?

3D concrete printing and smart design brings sustainability benefits too, allowing us to reduce material use by up to 50%, reducing the need for primary resources and lowering a building or structure's carbon footprint. In addition, 3D concrete printing provides flexibility to adapt the space to specific needs and reduces construction times by 35-40%.

EMPOWERING SMART DESIGN TO BUILD BETTER WITH LESS

We make this possible with proprietary technologies ranging from our 3D concrete printing ink TectorPrint, to the ultimate performance concrete, DYNAMax.

- 3D printing can reduce material use by up to 50%, with no compromise in terms of performance, while significantly lowering a building or structure's carbon footprint. With our TectorPrint mortar, we can unlock freedom of design and form, and achieve time, cost and material savings, as well as sustainability benefits.
- DYNAMax high-performance concrete delivers high strength, outstanding durability and superior rigidity to optimize usable space and build longer-lasting buildings. For example, at the Cosmopolitan Skyline Tower in Tijuana, Mexico.
- Carbon pre-stressed concrete (CPC) slabs are thin, light precast plates made of high-strength concrete reinforced with prestressed carbon fibers, which have the same load-bearing capacity as standard concrete slabs. They use up to 80% less material with up to 75% lower CO₂ emissions, and are circular by design.
- Using our digital concrete services for projects including The Ellinikon in Athens, Greece, Holcim can deliver structures that are built faster, last longer and are more sustainable.
 - ✓ SMARTCast speeds up the construction process with sensors installed in concrete to measure its temperature and assess its strength in real time.
 - ✓ Using a digital simulation to measure concrete flowability, SMARTFlow reduces cost as well as delays, and supports sustainability by removing the need for real-size trials.
 - ✓ SMART herm simulates concrete's temperature development to reduce cost, mitigate risk and optimize its thermal profile.

DYN\MAX



3D-PRINTED OFFICE

TORRES DE LA ALAMEDA, SPAIN

In 2024, we worked with A3D Building to build Spain's first 3D-printed office building at our Torres de la Alameda site. Using 3D concrete printing with our TectorPrint mortar unlocked freedom of design and form, and achieved time, cost and material savings, as well as sustainability benefits.

Read more:





"The 3D-printed office here in Torres de la Alameda is a great example of how companies like Holcim are pioneers and leaders in the transformation that both the building sector and society must undergo."

José María García, Deputy Minister of Housing of the Community of Madrid

GRÜZE INNOVATION LAB

WINTERTHUR, SWITZERLAND

Working with the Swiss city of Winterthur, Holcim pioneered the use of carbon prestressed concrete (CPC) to build the award-winning Grüze Innovation Lab. This 120-m² pavilion opened in 2024, and serves as an information center, event location and workshop for sustainable construction.

Read more:









WE ARE BUILDING ICONS
ACROSS THE WORLD THAT
SHOWCASE OUR SUSTAINABLE,
CIRCULAR, ENERGY EFFICIENT,
RESILIENT AND SMART BUILDING
SOLUTIONS – FROM END TO END.

EXPLORE THIS SELECTION OF ICONS WITH HOLCIM INSIDE.

Etihad Museum in Dubai, United Arab Emirates. Built with Holcim Roofing Systems.







WOOD WHARF

LONDON, UK

In London's historic Canary Wharf, Wood Wharf is a mixed-use development that is revitalizing the neighborhood as a dynamic place to live, work, learn and play. An icon of circular construction, Wood Wharf is one of the UK's first projects to use Holcim's ECOPact low-carbon concrete with 20% CDM inside recycled from nearby North Quay - supporting London's ambition to be a global leader in circularity.





THE ELLINIKON

ATHENS, GREECE

Built to last with Holcim inside, The Ellinikon is a modern, green city of 6.2 million m² that is rising up in Athens. 90% of the structures currently being built use Holcim's sustainable building solutions - from ECOPlanet cement to ECOPact, DYNAMax and Hydromedia concretes and ZinCo green roofs.

Discover more:





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SQUARE

ST. GALLEN, SWITZERLAND

Designed by renowned architect Sou Fujimoto, SQUARE at the University of St. Gallen is a landmark in sustainable design. Holcim's special ECOPact+low-carbon concrete mixes were used for the building's ceilings, while the walls used local recycled aggregates as well as ECOPlanet Susteno cement with 20% construction demolition materials inside.

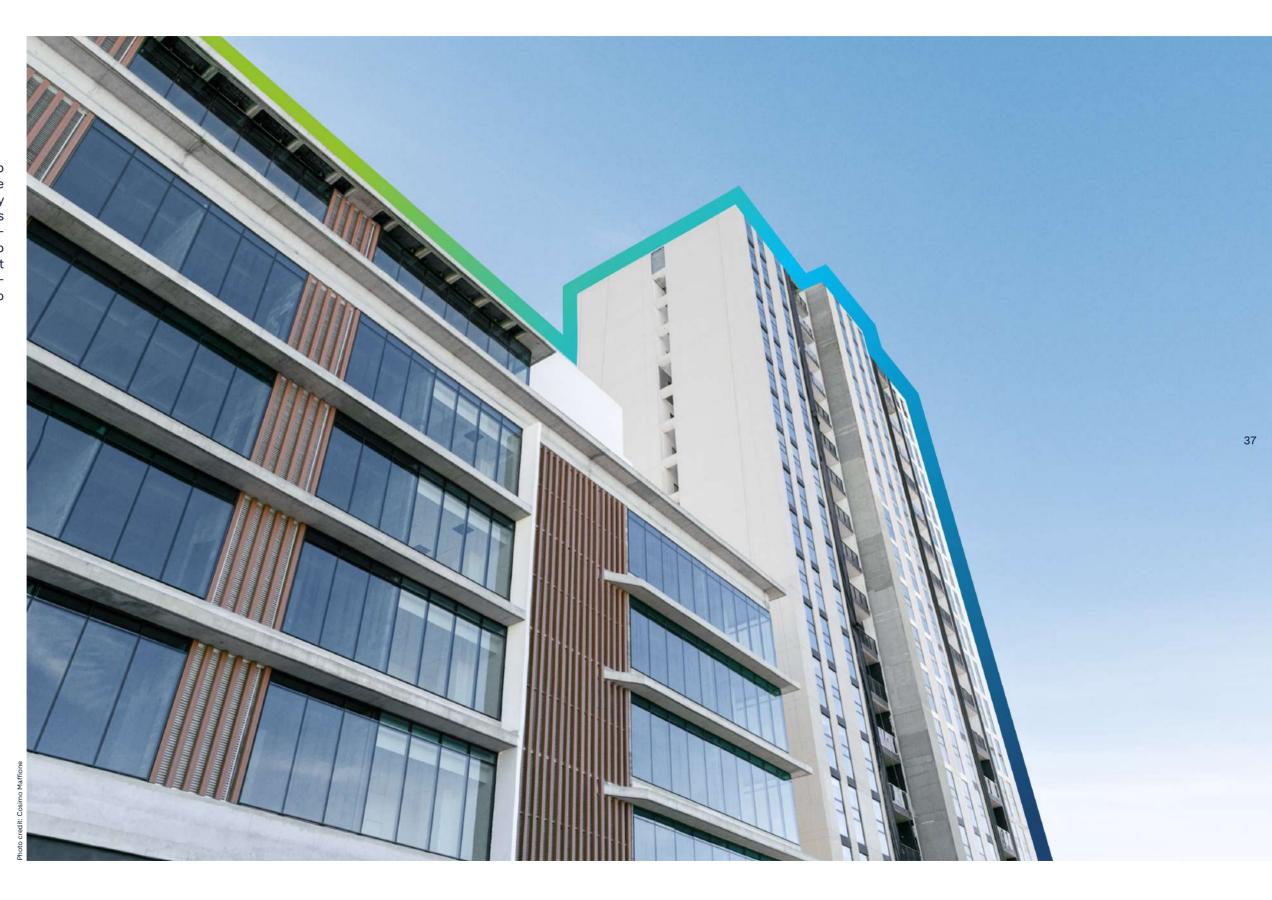




MORANTA TOWERSALTILLO, MEXICO

Saltillo near Monterrey is a growing hub for high-tech industries, from aerospace to automotive and more. Moranta Tower by Grupo DAGS is the centerpiece of the city's iconic new Distrito Karena mixed-use development. This takes smart sustainability to new heights as Mexico's first full ECOPact building, and our SMARTCast digital concrete services technology was also used to optimize the mix design.







LA CONFLUENCENAMUR, BELGIUM

In the Belgian city of Namur, La Confluence has revitalized the district of Le Grognon. The center includes an esplanade, pedestrian bridge and lush green spaces, plus a visitor center and restaurant. The project was realized using Holcim's high-value Building Solutions – which include Elevate's RubberGard EPDM roofing for outstanding waterproofing, and an intensive green roof from ZinCo.





EUROPEAN PATENT OFFICE

VIENNA, AUSTRIA

Standing close to Vienna's iconic Belvedere Palace in the city's historic center, the European Patent Office (EPO) building has been renovated using Holcim's integrated end-to-end solutions. ECOPact low-carbon concrete with ECOCycle inside was used to reduce construction emissions and drive circular construction, while Elevate ISOGARD insulation contributes to the building's energy efficiency.





ABOUT HOLCIM

Holcim is the leading partner for sustainable construction with net sales of CHF 16.2 billion¹ in 2024, creating value across the built environment from infrastructure and industry to buildings.

Headquartered in Zug, Switzerland, Holcim has more than 48,000 employees in 45 attractive markets – across Europe, Latin America and Asia, Middle East & Africa.

Holcim offers high-value end-toend Building Materials and Building Solutions, from foundations and flooring to roofing and walling – powered by premium brands including ECOPlanet, ECOPact, and ECOCycle.

