

Advancing Net Zero Status Report 2020



ADVANCING
NET ZERO



WORLD
GREEN
BUILDING
COUNCIL

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Foreword

Cristina Gamboa, CEO, World Green Building Council

For this year's World Green Building Week, we ask businesses and governments to #ActOnClimate.

As health and wellbeing concerns dominate our headlines, we must acknowledge the role that buildings play in our sense of place and happiness. But we must also consider the major contribution they make to global carbon emissions.

The catastrophe of the COVID-19 pandemic has devastated lives and economies around the world. It also temporarily brought cleaner air in cities and caused global carbon emissions to decline. But this is just part of the story. The decline in emissions will be minuscule in comparison to the total reduction necessary to meet the Paris Agreement targets.

Our report outlines the latest in industry action towards achieving our vision of a more sustainable built environment for everyone, everywhere.

But to achieve our targets, we must #BuildBackBetter as an industry.

We must embrace visionary regulation to embed net zero strategies and concepts within a green economic recovery. This includes performance-based metrics, deep renovation improvements to existing buildings, clean energy infrastructure and nature-based solutions.

Mina Hasman, Associate, Skidmore, Owings & Merrill LLP

WorldGBC's Advancing Net Zero project is empowering the built environment sector and its constituents to catalyse global leadership towards a regenerative future. The long-term vision and direction it defines with its roadmap builds clarity in the steps the industry must take, and gives confidence that the far-reaching Net Zero goal is achievable.

We aim to lead by example with the work we deliver, and to inspire others to accelerate change with the advocacy we intend to amplify at a global scale. Our collective action is what will make the difference – we, therefore, hope you will join us in this journey.



The industry is primed to deliver these solutions at scale, and business and governments have a unique opportunity to take bolder climate leadership. Regulation is the key enabler in unlocking this potential.

I am excited to see what the next year brings for the Advancing Net Zero project, as it builds on its strategy to both promote leadership through impact reporting from the Commitment and introducing a new whole life carbon pathway; and supporting the sharing of educational resources on net zero buildings through an ANZ Academy.

As we advance towards COP26, taking place in November 2021, it has never been more important to embrace these opportunities.

Bianca Wong, Head of Sustainability, Kingspan Group PLC

We welcome the latest ANZ Status Report by the World Green Building Council. The programme continues to build the momentum and gain the traction needed to progress our collective goal of a decarbonised built environment by 2050. We are proud to be a signatory of the Commitment; we aim to play a leading role in the Net Zero transition through our own ambitious internal efforts and by providing innovative solutions to market. We must work collectively to drive this work forward at pace.



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About WorldGBC

The World Green Building Council (WorldGBC) is a global network leading the transformation of the built environment to make it healthier and sustainable.

Collectively, with our Green Building Councils (GBCs) in around 70 countries, we drive action to deliver on the ambition of the Paris Agreement and UN Global Goals for Sustainable Development. Through a systems change approach, working across sectors, we are aiming to transform the building and construction industry towards a net zero carbon and sustainable built environment.

We are committed to green buildings for everyone, everywhere to build a better future.

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Leading GBC action

The building and construction sector remains a critical element in the race to keep carbon emissions below dangerous levels for our planet.

Buildings consume 36% of energy produced, and are responsible for 39% of global carbon emissions, making it the largest contributing sector to climate change.

This must stop.

WorldGBC's global Advancing Net Zero project works with GBCs from across the world to advance net zero carbon buildings through six impact pathways: collaborate, advocate, rate, communicate, educate, innovate, and invest. WorldGBC represents the network to accelerate climate action as part of its new 2020-2022 strategy.

Through the inspiring actions of Green Building Councils, businesses, governments and non-profit organisations from around the world, the sector is demonstrating that it can be a major solution to the problem. The technical solutions exist and are being applied to projects around the world.

Commitments are being made towards net zero portfolios, with actions being taken and progress tracked.

Using a whole life approach, the project is empowering GBCs to identify the workstreams and initiatives that would be most effective in their markets to address both operational and embodied carbon emissions. This ensures a flexible approach that can be tailored to solutions across different climates, cultures, and technical feasibility. This in turn increases understanding and momentum towards net zero buildings that are better for the planet, for people, and for resilient economies.

"Bringing embodied carbon upfront"



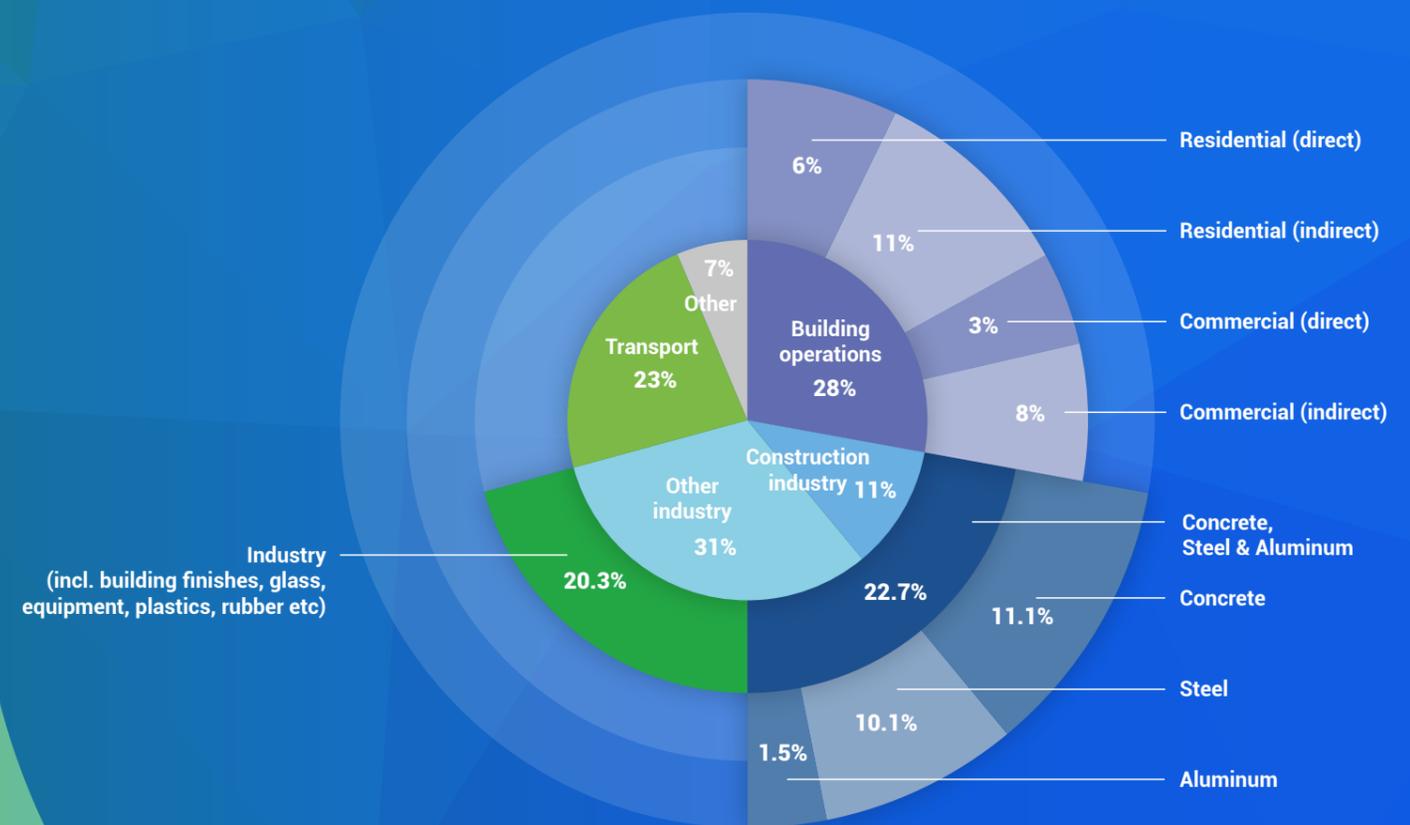
Breakdown of emissions

The energy required to heat, cool and power the world's buildings – residential and non-residential – is 28%. This includes both direct and in-direct emissions, meaning that strategies towards achieving net zero operational carbon must address both on-site fuel combustion such as gas boilers and diesel generators, and the emissions from purchased electricity. Both of these factors can be reduced more effectively if consumption is also reduced through energy efficiency measures.

The remaining 11% of emissions associated with the sector come from the materials and construction processes. The most carbon intensive materials are concrete, steel and aluminium, but they are not just used for buildings. These materials sectors on their own are responsible for a combined total of 22.7% of emissions.

If the building and construction sector were to drastically shift demand towards low carbon options for these materials, this would require a transformation in the manufacturing processes of the supply chain. This would affect the total emissions for those materials streams and have an enormous impact on emissions mostly attributed to other sectors through these three materials alone.

The total potential impact, therefore, of the buildings and construction sector, is far greater than the 39% it is directly responsible for.



Data from the Global Status Report 2019 (Global Alliance of Buildings and Construction and International Energy Agency) and Architecture 2030

Definitions

The sustainable building and construction industry has seen a remarkable shift towards net zero concepts, but the terminology can vary. Depending on the context, market conditions and awareness, and availability of solutions, the appropriate target for a project might change.

The general trend is a move towards performance-based metrics and ensuring that building projects are accountable for the resources they use – materials, energy, water and more.

The distinction between these terms often lie in the combination of measures being adopted.

Energy efficiency remains an important concept across the industry as it ensures that energy is not wasted and is used efficiently to maintain comfort levels. This is particularly relevant in summer or winter when there is a sharp contrast with temperatures outside, or in high-energy intensive buildings.

The baseline for terminology will be determined by local code or regulation requirements. Depending on the stringency of these codes, there are likely to be passive (i.e. building layout, building fabric) and active (i.e. heating and cooling systems, lighting etc.) measures that can be implemented to bring down the predicted energy consumption.



This reduced demand can then be met by a combination of measures:

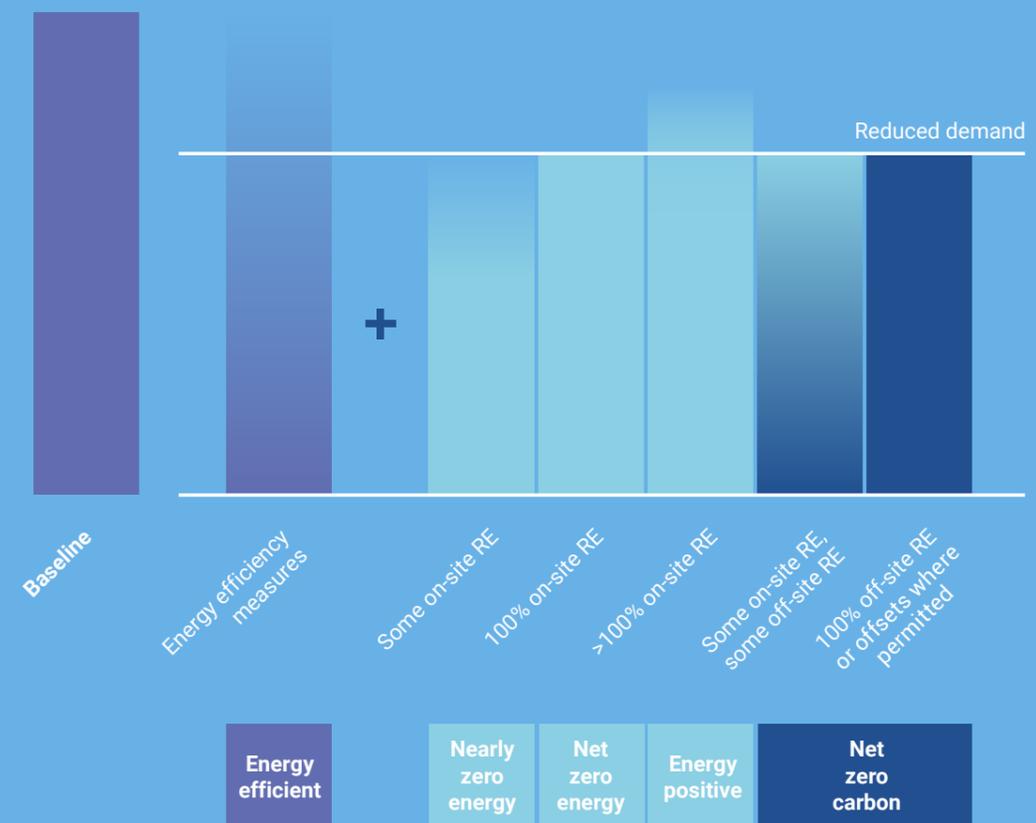
Nearly zero energy the annual energy demand is partially met through on-site renewable energy sources, but may still require connection to a fossil-fuel fed grid

Net zero energy the entire annual energy demand is met through on-site renewable energy sources, such as solar panels

Energy positive the amount of energy produced on-site exceeds the annual demand, and could be exported to the grid or surrounding buildings

Net zero carbon the annual energy demand is met through a combination of on-site renewable energy and/or off-site renewable energy; where there are remaining emissions, these may be met through the use of offsets, depending on local guidance

In addition to addressing operational carbon, WorldGBC advocates for the effective reduction of embodied carbon from materials and construction throughout a building's lifecycle through a whole lifecycle approach. See more information on [page 16](#).



Whole Life Carbon Vision

2050

New buildings, infrastructure and renovations will have **net zero embodied carbon**, and all buildings, including existing buildings, must be **net zero operational carbon**

Net Zero Operational Carbon

Definition

A net zero carbon building is highly energy efficient with all remaining energy from onsite and/or offsite renewable sources

Guiding Principles

- 1. Measure and disclose carbon**
Carbon is the ultimate metric to track, and buildings must achieve an annual operational net zero carbon emissions balance based on metered data
- 2. Reduce energy demand**
Prioritise energy efficiency to ensure that buildings are performing as efficiently as possible, and not wasting energy
- 3. Generate balance from renewables**
Supply remaining demand from renewable energy sources, preferably on-site followed by off-site, or from offsets
- 4. Improve verification and rigour**
Over time, progress to include embodied carbon and other impact areas such as zero water and zero waste

Net Zero Carbon Buildings Commitment

All buildings within direct control to operate at net zero carbon by 2030



2030

New buildings, infrastructure and renovations will have at least **40% less embodied carbon** with significant **upfront carbon** reduction, and all new buildings must be **net zero operational carbon**

Net Zero Embodied Carbon

Definition

A net zero embodied carbon building (new or renovated) or infrastructure asset is highly resource efficient with **upfront carbon** minimised to the greatest extent possible and all remaining embodied carbon reduced or, as a last resort, offset in order to achieve net zero across the lifecycle

Guiding Principles

- 1. Prevent**
Avoid embodied carbon from the outset by considering alternative strategies to deliver the desired function
- 2. Reduce and optimise**
Evaluate each design choice in terms of the upfront carbon reductions and as part of a whole lifecycle approach
- 3. Plan for the future**
Take steps to avoid future embodied carbon during and at end of life
- 4. Offset**
As a last resort, offset residual embodied carbon emissions within the project or organisational boundary where possible or if necessary through verified offset schemes

Net Zero Operational Carbon

Net Zero Embodied Carbon

Around the world in ANZ



[View all GBC snapshots](#)

Net Zero Carbon Buildings Commitment

WorldGBC's **Net Zero Carbon Buildings Commitment** [↗](#) (the Commitment) challenges companies, cities, states and regions to reach net zero operating emissions in their global portfolios by 2030, and to advocate for all buildings to operate at net zero by 2050.

The Commitment is outcome focused and action oriented, providing best practice guidance to develop globally ambitious yet locally relevant, flexible and universally viable solutions to reduce energy demand and reduce carbon emissions from buildings at scale.

Each signatory completes an action plan through the joining process, thereby indicating their intention to act on their commitment to:

- deliver genuine change;
- verify building performance using, for example, green building certification schemes;
- and report on progress towards decarbonisation goals.

As true industry leaders, signatories will utilise their business activities and supply chains to increase the support for and development of net zero carbon buildings, demonstrating the role they can play in reducing emissions from both their carbon footprint and handprint.

Cities that have committed to enact regulation for net zero buildings through the **C40 Net Zero Carbon Buildings Declaration** [↗](#) are already reporting **progress towards their goals** [↗](#).

2020 is the first year signatories will report progress, to demonstrate the impact already being taken to decarbonise their portfolios. A new collaboration with GRESB will ensure that the Commitment is recognised in the GRESB Real Estate Assessment, and ensure a streamlined reporting process.

Whilst the Commitment is currently focused on Scope 1 and 2 energy related emissions, a whole life carbon pathway is under development to recognise how stakeholders across the value chain can also drive down embodied carbon emissions.

New and existing signatories to the Net Zero Carbon Buildings Commitment celebrated at an awards ceremony in Brussels in December 2019.



Advancing Net Zero Status Report 2020

Leaders that have signed the Commitment pledge to:

COMMIT



to an advanced trajectory for all new and existing buildings within direct control of the organisation to operate at net zero carbon by 2030; regulate and/or advocate for all buildings to operate at net zero by 2050

DISCLOSE



and assess annual asset and portfolio energy demand and carbon emissions

ACT



to reduce emissions by developing and implementing a decarbonisation roadmap outlining key actions and milestones towards energy efficiency and renewable energy

VERIFY



enhanced energy performance, reduced carbon emissions and progress towards net zero carbon assets and portfolio

ADVOCATE



for wider emissions reduction by acting as a catalyst through core organisation activities for further action within respective supply chains

For businesses, the Commitment is one of three pathways available to join EP100, an initiative by The Climate Group in partnership with Alliance to Save Energy. It brings together energy-smart companies committed to using energy more productively, to lower greenhouse gas emissions (GHGs) and accelerate a clean economy.

[Find out more](#) [↗](#)

EP 100 | °C

Bringing Embodied Carbon Upfront

Long considered the “blindspot” of the building and construction sector, WorldGBC’s report *Bringing Embodied Carbon Upfront (2019)* demystified embodied carbon, the significant impact on global carbon emissions, and the urgent and time-critical need to address them.

The report set out a vision for a whole lifecycle approach to full decarbonisation of the buildings and construction sector – addressing both operational carbon and emissions from materials and construction, with an emphasis on upfront carbon.

It included the definition of embodied carbon as it occurs throughout the building’s lifecycle, best practice principles to reduce emissions, and the actions and milestones that must be taken by all stakeholders across the value chain.

This ambitious vision cannot be achieved by one part of the supply chain alone. It relies on a combination of clear, demand-side signals, policy roadmaps, financial investment and supply chain solutions to create industry confidence to facilitate the systemic change needed.

Endorsed by nearly 90 organisations including policymakers, financial institutions, think tanks, developers and manufacturers, it continues to be acclaimed by industry groups and has stimulated action across the sector to overcome the current market barriers.

[Find out more](#) →

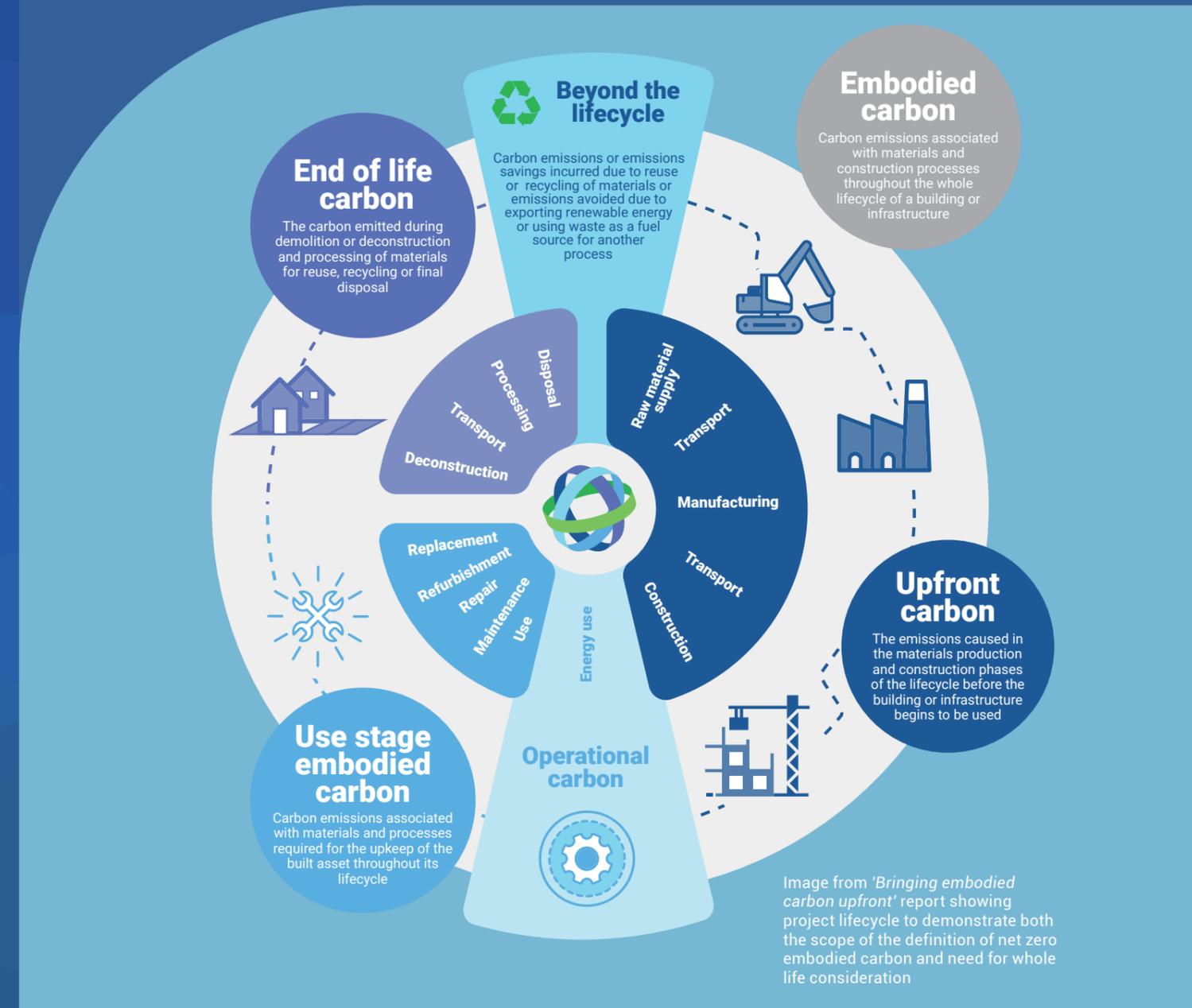


Image from 'Bringing embodied carbon upfront' report showing project lifecycle to demonstrate both the scope of the definition of net zero embodied carbon and need for whole life consideration



The report was launched at an exclusive, invite-only event at the Empire State Building in New York City, during Climate Week NYC 2019. We were honoured to welcome as our keynote speaker Krista Mikkonen, Minister for the Environment and Climate Change, Finland.

Ms Mikkonen appealed to the construction sector to accelerate its transition to low-carbon methods, and outlined Finland's progressive approach to tackling embodied emissions from buildings and construction, which includes making the carbon footprint of buildings part of building regulations by 2025.

[Read the full keynote speech](#) →

Promising and notable recent developments from industry in line with our vision include:

In January 2020, Microsoft, one of the companies that endorsed the embodied carbon report, made the unprecedented announcement that they will not only be carbon negative by 2030, but by 2050, they will remove from the environment all the carbon the company has emitted either directly or by electrical consumption since it was founded in 1975. This will include an aggressive programme to cut both direct emissions and across the entire supply and value chain, and to make carbon reduction an explicit aspect of procurement processes.

[read more](#) 

London Energy Transformation Initiative, a network of over 1,000 built environment professionals in the UK, produced the Embodied Carbon Primer to support project teams to design buildings that deliver ambitious embodied carbon reductions. It provides easy-to-follow best practice and toolkits for reducing embodied carbon in buildings and can also aid planners to be aware of how planning recommendations on materials, massing and treatment of sites may affect embodied carbon.

[read more](#) 

The Planning Institute of Australia declared a climate emergency in February 2020. Referencing the report in their statement, it has adopted a target that "By 2050, new buildings, infrastructure and renovations will have net zero embodied carbon, and all buildings, including existing buildings, must be net zero operational carbon".

[read more](#) 

Announced in March 2020, the European Commission's EU Green Deal has incorporated recommendations advocated by WorldGBC and essential to achieve a sustainable built environment as part of the Circular Economy Action Plan, including setting requirements for whole life carbon, and integrating these into green public procurement and sustainable finance policy.

[read more](#) 

In May 2020, Cembureau, the European Cement Association, published its new Carbon Neutrality Roadmap, setting out its ambition to reach net zero emissions by 2050. Through reducing CO2 emissions at each stage of the value chain – clinker, cement, concrete, construction and (re)carbonation – the roadmap sets the role of technology and making political and technical recommendations to support this objective.

[read more](#) 

To overcome data accessibility challenges, Bionova have launched in May 2020 One Click LCA Planetary, in partnership with several organisations including 11 GBCs. The free embodied carbon cloud software will allow comparison of different material options for design using local Environmental Product Declarations (EPDs), and allow requests for EPDs from manufacturers with a cost-efficient option to calculate them. All calculation data gathered will support the creation of local embodied carbon baselines and benchmarks for different building typologies.

[read more](#) 

These initiatives send strong signals for the direction of travel in taking responsibility and accountability for the emissions that our sector is responsible for. The ripple effect will be felt as more organisations continue this trend, enabling collaboration and innovation, and bringing solutions to market faster. This, in essence, is the Theory of Change as set out in our report, already in action.

Collaboration

Establishing roadmaps to form a common vision

Communication

Raising awareness and building capacity

Education

Addressing foundational gaps in skills, data and benchmarks

Innovation

Creating new business models, new technologies and circular patterns

Regulation

Mandating reductions in embodied carbon that are aligned with 1.5°C compliant decarbonisation pathways

Accelerate

Harness the power of voluntary, financial, policy and regulatory market forces



Advancing Net Zero in numbers

May 2020



27

Green Building Councils participating in the Advancing Net Zero project, actively working to advance net zero carbon buildings

17

Green Building Councils with adopted or adapted certification schemes and programmes launched

418

Buildings certified net zero through GBC schemes

95

Net Zero Carbon Buildings Commitment signatories (full list on [page 33](#))

Regional ANZ projects

WorldGBC is the world's largest green building network for local, regional and global impact. We build on the strength of our network of GBCs and their members, and coordinate collaboration for enhanced impact through regional and global projects towards common goals and outputs that are transferable across geographical boundaries.

Together, we go further, faster, towards a decarbonised built environment.

Europe: BUILD UPON²

Phase two of our BUILD UPON project, funded by the EU's Horizon 2020 programme, will play a key role in tackling one of Europe's biggest climate challenges: the renovation of its existing building stock. The project will develop a universal framework to effectively measure the environmental, social and economic impact of deep building renovation in cities.

[Find out more](#) →



Asia Pacific: ANZ in APN

In order to identify the best approaches to achieving net zero buildings in the Asia Pacific region, a series of workshops supported by We Mean Business and the Ramboll Foundation have been held in China, India and Hong Kong, along with a webinar series across the region. This included exploring responses to the climatic and geographical challenges of the region to embrace low operational and embodied carbon strategies in buildings.



Americas: Cities Climate Action

A ground-breaking city engagement initiative, supported by P4G and the Building Efficiency Accelerator, is building a bridge towards net zero carbon in Latin America and ensuring millions of people benefit from better buildings. It involves 23 cities and states from 10 different countries and brings together GBCs, industry and NGOs to accelerate technical solutions to net zero.



MENA & Africa: ANZ workshops

Continuing a series of events that started in 2018 for promoting the urgency and achievability of net zero carbon buildings, two dedicated events supported by Majid Al Futtaim were held in Kenya and Egypt to bring together local stakeholders to share experiences and solutions for the regions, support economic growth and stimulate the supply of green buildings.



[View the full list of our regional networks](#) →

Case Studies



NUS SDE4, a five-storey, net zero-energy building (NZEB) in the Singapore, certified to DGNB Climate Positive from the German Sustainable Building Council

"An integral aspect of net zero-energy consumption is that conventional approaches to air conditioning have to be challenged."

[view online](#) ↗



The Phenix, a net zero refurbishment project in Montreal, Canada, has achieved Zero Carbon Standard – Performance from Canada Green Building Council, and also exhibits extensive features that enhance human health

"For Lemay, the decision to retrofit the Phenix instead of designing and constructing a new building was significant as it resulted in a much lower carbon footprint than that of a new build – a reduction of more than 86%."

[view online](#) ↗



The Sohrabji Godrej Green Business Centre in Hyderabad, a retrofit project rated Net-Zero Energy Platinum by the Indian Green Building Council

"The centre exemplifies sustainable performance through the thoughtful integration of passive and active measures."

[view online](#) ↗



Discovery Elementary School, in Arlington, Virginia, US, is the first school to achieve the US Green Building Council's LEED Zero Energy certification, and is now net positive.

"The kids can see the building energy dashboard and ask questions like, 'Why did we generate more energy today than we did yesterday?'"

[view online](#) ↗

Visit the [WorldGBC Case Study Library](#) for more examples of verified net zero buildings.

GBC action timeline

July 2019

UKGBC publish 'Guide to Scope 3 Reporting in Commercial Real Estate'

September 2019

NZGBC launch 'A Zero Carbon Road Map for Aotearoa's Buildings' and carboNZero certification

Sets out the steps needed to get all buildings zero carbon by 2050 and all new buildings zero carbon by 2030, from building owners, tenants, developers, and government.

[Find out more at nzgbc.org](https://www.nzgbc.org)

UKGBC launch Climate Commitment Platform

An online tool designed to profile the headline commitments and carbon targets of built environment organisations, and a Climate Leadership Model to assist companies in setting climate commitments to ensure they are consistent with best practice.

[Find out more at ukgbc.org](https://www.ukgbc.org)

October 2019

Philippines GBC launch BERDE Net Zero

Green Building Council of Australia, along with the Property Council of Australia, launch 'Every Building Counts – A practical plan for emissions reduction in the built environment'

Outlining policy recommendations for all levels of government in Australia to drive emission reductions, including targets and building codes – including mandatory disclosure and a trajectory of increases to minimum standards of energy efficiency, broader adoption of building certification, financial and planning incentives, demonstration projects, and education and training.

[Find out more at everybuildingcounts.com.au](https://www.everybuildingcounts.com.au)

November 2019

USGBC announce LEED Positive

A vision statement and development roadmap that will lay the foundation for a future of LEED, transitioning from strategies that reduce harm to encouraging buildings to become a vehicle for environmental restoration and repair.

[Find out more at usgbc.org](https://www.usgbc.org)

GBC Indonesia soft launch of Greenship Net Zero

December 2019

European Leaders' Summit

City and business leaders came together to workshop strategies to bring net zero solutions to scale in cities.

January 2020

Irish GBC include Zero Carbon in Home Performance Index

March 2020

Canada GBC launch Zero Carbon Building Standard 2.0

DGNB release Climate Positive: Now! Report

Showing how every building can make a contribution to climate protection and providing assistance in the form of pragmatic and practical implementation.

[Find out more at dgnb.de](https://www.dgnb.de)

April 2020

Norwegian GBC release 'Think twice before demolishing' booklet

Addressing common myths that contribute to the demolition of buildings by thinking about old buildings in new ways.

[Find out more at byggalliansen.no](https://byggalliansen.no)

Canada GBC release 'Accelerating to Zero: Upskilling for Engineers, Architects, and Renewable Energy Specialists' report

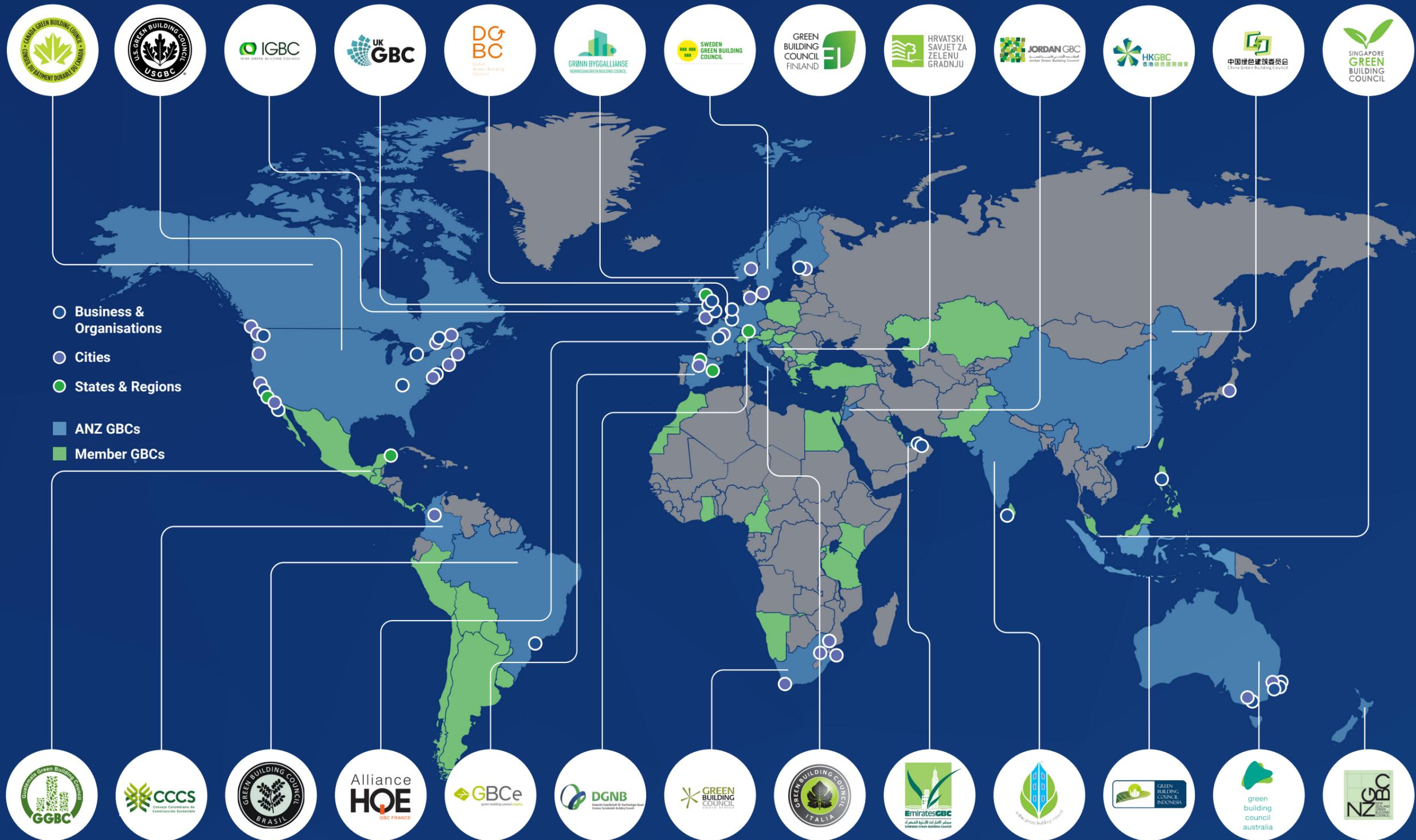
Identifies opportunities for upskilling around the competencies needed to enable the building sector to deliver net zero buildings.

[Find out more at cagbc.org](https://www.cagbc.org)

May 2020

GBC Australia release strategy for Green Star Homes for healthy, resilient, and net zero energy homes

World Map



1

Responsible investment

Net zero buildings mitigate risk and ensure assets are resilient against future climate scenarios.

In addition to having lower operational and maintenance costs and increased asset value and desirability, net zero buildings provide an opportunity to prepare for future regulations as governments respond to their obligations under the Paris Agreement. By planning for performance monitoring, disclosure and upgrading, investors and owners are increasingly looking to 'Paris proof' their assets for increased demand in environmentally conscious buildings operations and healthy, sustainable spaces that meet environmental, social and governance compliance.

Data from the Climate Bonds Initiative ☞ states that global green bond and green loan issuance reached an adjusted US \$257.7 billion in 2019, marking a new global record. This is a 51% increase on the previous year and was primarily driven by the wider European market.

The United Nations-convened Net Zero Asset Owner Alliance ☞ is an international group of institutional investors delivering on a bold commitment to transition their investment portfolios to net zero greenhouse gas emissions by 2050, representing more than US \$4 trillion in assets under management.

Green mortgages supporting the mass market financing of energy efficient renovation of existing homes are also

increasing in uptake, to help address the significant challenge of incentivising upgrade of private ownership properties, and provide financial and non-financial benefits.

The EU taxonomy is a tool to help investors understand whether an economic activity is environmentally sustainable and to navigate the transition to a low-carbon economy. Setting a common language between investors, issuers, project promoters and policy makers, it helps investors assess whether investments are meeting robust environmental standards and are consistent with high-level policy commitments such as the Paris Agreement on Climate Change. The recent Taxonomy report ☞ specifically references our vision for total decarbonisation of the sector. Moreover, WorldGBC called for the taxonomy to adopt a lifecycle approach ☞ to give a clear signal to the financial sector that Paris-proof means net zero whole life carbon. The report proposes timeline for updating the criteria to include embodied carbon that is aligned to our report, *Bringing Embodied Carbon Upfront*.

And institutional investors are already supporting low embodied carbon solutions, such as the largest investment in the construction of wooden buildings in Finland ☞ by Keva, a Commitment signatory.

These initiatives are leveraging the key role the investor community can play in catalysing decarbonisation of the global economy and investing in climate resilience.

Recognising the impact of climate change on your organisation

Early climate disclosure focused on the question "What is the impact of your organisation on climate change?" The introduction of Task Force on Climate-related Financial Disclosures (TCFD) reporting requirements flips this question on its head, to ask "What will be the impact of climate change on your organisation?"

This switch of emphasis requires investors to consider both near and long term impacts and requires sophisticated modelling techniques that collates both physical and transition risk appraisals. To fully appreciate the risks and the opportunities that can come from full TCFD assessment and disclosure requires expertise from an interdisciplinary team that has not hitherto collaborated before. Now the knowledge and skills of scientists and engineers need to work alongside risk and financial modelling experts.

Investors who are PRI signatories and who already respond to the annual GRESB survey will be aware that there is an increasing expectation not only account for climate change as an optional sustainability metric but fully align with the principles of TCFD; which means embedding climate risks into all governance aspects of the organisation. This is no longer an optional approach and is not a small undertaking. It requires traditional organisational structures and hierarchies to be re-imagined to reflect the wide skill sets and knowledge needed to understand future impacts, and then implement new requirements from investments and organisational behavioural change.

Although the TCFD guidance rightly focuses on identifying and managing risk, in order to galvanise the need for action it is important to also recognise the substantial opportunities to be identified by the same governance review processes by identifying

innovation opportunities from adoption of new technologies and new business operating models. For those who wish to prosper in a low carbon world it is imperative that both risks and opportunities are managed in a balanced way.

What is clear from experiences within the real estate sector to date is that the relationship between investor/ landlord and tenant and the wider community stakeholders needs to change, into a more collaborative one in nature rather than one of simply contractual duties. Something that is crucial to managing assets, for the benefit of people and the planet, is the acquisition of timely and good quality utility data, as without it is difficult to identify and plan improvements for carbon reduction. For many investors who report to GRESB each year, obtaining good data for Scope 1, 2 and 3 emissions continues to be challenge. Technological and relationship solutions need to be identified to rectify this basic barrier to enable behaviour change.

A second challenge for both real estate and infrastructure sector investors is how to address embodied carbon over the life of an asset. Many investors are becoming more comfortable with the requirements for measuring operational carbon but are far less clear on how to define and manage embodied carbon. Although assessments such as BREEAM and LEED have promoted whole life carbon appraisals for many years, and there are well proven standards to use to make the assessments, such appraisals are not routinely undertaken.

In the coming decade embodied carbon will become the largest share of an asset's overall carbon impact. Is it therefore essential to recognise that embodied carbon debt accrues immediately and will determine the timescale and scale of building retrofits and choices of materials used.

In some cases institutionally accepted designs and engineering solutions will need to be challenged.

Author: Matthew Brundle, Director, EVORA Global



List of signatories to WorldGBC's Net Zero Carbon Buildings Commitment

May 2020

Businesses & Organisations

Adventist Education Southern Brazilian Union - Curitiba, Brazil
 AESG - Dubai, UAE
 AMP Capital Wholesale Office Fund - Sydney, Australia
 Armstrong Fluid Technology - Toronto, Canada
 Arthaland - Manila, Philippines
 Assura - Warrington, UK
 Atelier Ten - Sydney, Australia
 Avison Young UK - Birmingham, UK
 Bennetts Associates - London, UK
 Berkeley Group - London, UK
 Bionova - Helsinki, Finland
 Brandix - Colombo, Sri Lanka
 Bruntwood - Manchester, UK
 BuroHappold Engineering - Bath, UK
 Carbon Credentials - London, UK
 Citycon - Espoo, Finland
 Cbus Property - Melbourne, Australia
 Commonwealth Bank of Australia - Sydney, Australia
 Cundall - Newcastle, UK
 Deerns - The Hague, Netherlands
 Dexus - Sydney, Australia
 EcoReal - Helsinki, Finland
 EVORA Global - London, UK
 ExCool - Bromsgrove, UK
 FORE Partnership - London, UK
 Foster + Partners - London, UK
 Frasers Property Australia - Sydney, Australia
 Goldman Sachs - New York, New York
 GPT Wholesale Office Fund - Sydney, Australia
 Grimshaw - London, UK
 Grosvenor - London, UK
 Hudson Pacific Properties - Los Angeles, California
 Integral Group - Oakland, California

Joseph Homes - London, UK
 JLL UK - London, UK
 Keva - Helsinki, Finland
 Kilroy Realty Corporation - Los Angeles, California
 Kingspan - Dublin, Ireland
 Lemay - Montreal, Canada
 Lendlease Australian Prime Property Fund (APPF) Commercial - Sydney, Australia
 Lendlease Australian Prime Property Fund (APPF) Industrial - Sydney, Australia
 Lendlease International Towers Sydney Trust - Sydney, Australia
 Lendlease One International Towers Sydney Trust - Sydney, Australia
 Local Government Super - Sydney, Australia
 Majid Al Futtaim - Dubai, UAE
 Max Fordham - London, UK
 Monash University - Melbourne, Australia
 Multiplex - London, UK
 Natural Resource Defense Council - New York, New York
 Newsec Finland - Helsinki, Finland
 Nightingale Housing - Melbourne, Australia
 Petinelli - Curitiba, Brazil
 Salesforce - San Francisco, California
 Shaw Contract - Dalton, Georgia
 Signify - Amsterdam, Netherlands
 Stockland - Sydney, Australia
 Surbana Jurong - Singapore
 Sydney Opera House Trust - Sydney, Australia
 Varma - Helsinki, Finland
 Wereldhave - Amsterdam, Netherlands
 YLVA - Helsinki, Finland

Cities

Copenhagen, Denmark
 Cape Town, Durban, Johannesburg & Tshwane, South Africa
 Heidelberg, Germany
 Helsinki, Finland
 London, UK
 Los Angeles, New York City, Newburyport, Portland, San Francisco, San Jose, Santa Monica, Seattle & Washington DC, United States
 Medellín, Colombia
 Melbourne & Sydney, Australia
 Montreal, Toronto & Vancouver, Canada
 Oslo, Norway
 Paris, France
 Stockholm, Sweden
 Tokyo, Japan
 Vallalodid, Spain

States & Regions

Baden-Württemberg, Germany
 California, USA
 Yucatan, Mexico
 Navarra & Catalonia, Spain
 Scotland, United Kingdom

Each organisation has developed an action plan detailing their strategy to achieving their targets. [View the Commitment signatory profiles](#)

2

Data and digitisation

Data is pivotal to high performance net zero buildings and essential to unlock the opportunities to reduce energy consumption and carbon emissions.

Sophisticated building modelling software, toolkits and product declarations radically improve transparency and communicate the impact of design decisions often with real-time feedback. This can facilitate a more streamlined approach to building design and optimise system and material selection. Forecasting future climate scenarios ensures that buildings are not just designed for today's world, and scanning technology enables quicker modelling of existing buildings for renovation.

And when a building is occupied, smart meters and building management systems can help ensure it is performing optimally, with sensors for real-time tracking and automation of control systems. The data allows prioritisation

of investment in intervention measures to improve performance.

The increased accessibility and accuracy of these tools is closing the "performance gap" – the gap between building performance and theoretical design predictions. This is particularly essential for net zero buildings to ensure a net zero carbon balance.

Advances in monitoring technology, building-integrated modelling, solutions modularisation, and off-site construction are also reducing waste through more accurate specifications and controlled environments, and maximising opportunities for circular economy.

These concepts ensure that buildings are responsive to changing conditions - adjusting energy generation, export and procurement patterns to ensure that net zero performance is sustained over the building's lifetime.

Optimising building performance

Building back stronger – lighting the way through a post pandemic recovery

The COVID-19 pandemic has upended economies around the world, promoting governments to pass massive economic stimulus and recovery plans to mitigate economic damage and speed recovery. Not surprisingly, building renovation plays a vital role in these efforts.

Five years after the Paris Climate Agreement, it is indeed high time to fix the ambition level and it could well be that this pandemic triggers a much needed sense of urgency to speed up action to reach carbon neutrality by 2050 at the very latest. And we know how to get there. By increasing annual energy efficiency improvement rates to 3%, doubling infrastructure (mostly building) renovation rates to 3%, and combining that with a 3% increase in the use of renewables per year we would be well on the way.

Key to achieving these climate goals are meaningful programs that turn talk into action. As the world leader in lighting, we strongly back first class initiatives of our partners, such as the Climate Group's EV100 and RE100 initiative, to which we have been a long-standing member, or the World Green Building Council's Net Zero Carbon Building Commitment that we signed as one of the first three signatories in 2018. In all these efforts, lighting plays an important part as it offers instant double-digit savings of up to 80% and it is one of the least invasive energy efficiency measures.

Equally important to global partnerships, is leading by example. It makes me proud to be part of a company that walks the talk and turns commitments into real projects. In 2015, we launched our

sustainability program, and in 2020, just five years down the road, we are approaching our goal and will be the first global lighting company to becoming 100% carbon neutral in all our operations worldwide later this year.

As part of our sustainability program, we are monitoring the energy mix to look at energy efficiency measures, renewable energy and transportation. Our Net Zero Carbon Buildings Commitment is an integral part of our global commitment. We have established a baseline for our building stock based on the data we monitor for energy consumption and carbon footprint per building and we track progress on energy saving and emissions reduction. As such, we have developed a multi-year plan to equip all over 300+ office building stock with state-of-the-art LED installations. A large number has already been converted to LED, and out of the remaining 40 buildings, 15 are in varying stages of progress since the project kick off in 2019.

As a result, in 2019 we managed to save 20% in energy consumption in our office buildings, showrooms and warehouses and increased our renewable electricity from 89% to 94% and achieved 54% reduction of carbon footprint and we switched our company fleet to 100% electric or hybrid vehicles.

The COVID-19 pandemic has been a stark reminder how vulnerable we are as a global community. But a crisis is also an opportunity. We now have a chance to build back better and finally tackle those imminent actions that are needed for a more resilient planet.

Author: Barbara Kreissler, Director of Professional Lighting, Global Public and Government Affairs, Signify

Did you ever think you could wear a building?

Data and digitisation ultimately prompt circularity in the construction sector.

Kingspan is committed to promoting an envelope-first approach and supporting the industry's development of innovative solutions towards decarbonisation. This will require systemic change in the way products are manufactured, specified, and transported and the way buildings are designed, built, maintained/operated, and ultimately deconstructed. In turn, it will provide a platform for increased circularity in the built environment, embedding value in materials, facilitating refurbishment, reuse, and better recycling.

In conjunction with providing high performance building envelopes that save more energy and therefore carbon, Kingspan announced *Planet Passionate* , its major 10-year global sustainability programme, at the end of 2019. The strategy – comprising of 12 ambitious targets, focusing on four key areas: Energy, Carbon, Circularity and Water – will make significant advances in the sustainability of Kingspan business operations and products. The strategy also falls in line with the UN Sustainable Development Goals and Science Based Targets.

Providing reliable, accurate data, direct from the manufacturer to feed construction projects and interacting at much earlier stages in the build process – when project outcomes are set – assists in optimising material specification. This can also help to identify future scenarios when a building is repurposed or decommissioned, thus coinciding with generating a more sustainable, circular built environment. Kingspan aspires to lead in capturing, organising and managing building data - ultimately creating accurate and relevant data which matches clients' real-world assets.

Building information models or modelling (BIM) has been around since the 1980s but with ever-increasing advancements in computational power and cloud storage, it is becoming the backbone for driving productivity, efficiency and traceability. This allows the building design and construction sectors to align their processes, leveraging these technological advancements in Computer Aided Design (CAD)

for increased collaboration and communication, project visualisation, enhanced specification, cost-estimation, simulation, improved clash-detection and a host of other benefits.

Within the built environment, BIM models can graduate to become working real-time models of the building: Digital Twins (DTs). An accurate BIM model keeps a 3D and real-time representation of all the materials and components of the structure, giving Facility Managers continuous foresight of when equipment will need replacing or servicing, thus creating greater efficiency in building management.

DTs are enhanced with various types of sensors or connected to the building management system (BMS) creating live working models of actual buildings. Sensors most commonly measure temperature, energy usage, movement, and light levels. DTs offer Facility Managers the opportunity to measure and tailor energy-in-use, noting and fixing any anomalies such as patches of high CO2 or low temperatures, increasing efficiency and reducing carbon emissions.

Data and DTs also contribute to the circular economy because for the first time, those dismantling, refurbishing or improving properties will know exactly what has been installed and how, thereby maximising material recovery. They will make refurbishment a predictable operation rather than an expensive game of roulette and turn demolition sites into places of resource rather than waste.

This process provides the opportunity for every material and component within a building to maintain value, enabling the circular use of materials. A 'Reuse, Recreate' design challenge, created and sponsored by the Kingspan Water & Energy division, offered students of NCAD (National College of Art and Design) in Dublin, the opportunity to design an object using pellets from reclaimed Kingspan Oil Tanks, showcasing the opportunity of circularity in plastic use. The winning student - Emily Jennings - utilised the reclaimed plastic pellets to craft dramatic statement jewellery, a far cry from the oil tank the material was 6-months earlier.

Data and digitisation are true enablers of sustainability in the built environment. The availability of accurate, reliable data on building components and performance strengthens sustainable building design, maintenance and deconstruction, facilitating the transition to a circular economy in the built environment. Such an economy will notably reduce the pollution in our environment caused by the extraction of materials, demonstrating there is far more value and opportunity in buildings than we could have imagined.

Photography Credit: Eric Cheung

Jewellery designed & created by Emily Jennings

Author: Bianca Wong, Global Head of Sustainability, Kingspan

Optimising materials specification, circularity, and streamlining construction

Feature

Our member GBCs take action



Anna Braune, Director Research and Development, DGNB

Climate Positive: Now! – DGNB's approach on advancing net-zero

Climate action has been a central concern of the DGNB German Sustainable Building Council since its foundation. With the awareness that the existing laws will not sufficiently resolve the problem, the only way currently left is voluntary proactivity. The DGNB has been working in this area since 2007, by advocating the planning, construction and operation of buildings which will make an active contribution to climate protection.

In order to bring about the necessary, systematic transformation of our decisions and actions on a broad scale, the DGNB has initiated a large number of activities relating to consistent climate action. They all show: the time for waiting is long gone! We can and must finally start discussing climate action not just in theory, but take it seriously and tackle it pragmatically.

One example is the publication, *Climate Positive: Now!* [↗](#), which is intended to encourage and educate. Far too much is taken out of context and discussed in abstract terms at events and in the media today. The DGNB wants to counter this with knowledge and clearly structured recommendations for action.

The content of the brochure is based on DGNB's "Framework for carbon neutral buildings and sites", which aims to make the decarbonisation of existing buildings feasible by 2050. One important message in it is that you first need to know where you currently stand before you can make a meaningful decision on which operational or constructional measures are the right ones to guide your building towards carbon neutrality.

The current version of the framework from March 2020 is based on an initial version published in 2018, the methodology of which has been evaluated in

numerous projects. In the Framework, the DGNB has compiled its definition of carbon neutrality and the corresponding explanations of procedures and strategies. The aim of the document is to create clarity on the market and to educate all players involved in the planning, construction, operation and management of real estate with regard to effective optimisation approaches for reducing greenhouse gas emissions.

Specifically, the framework describes comprehensive, practically applicable rules for accounting for the CO₂ emissions of buildings and sites. Based on the definitions formulated there for carbon neutrality in the operation and construction of buildings, the Framework provides the basis for developing building-specific climate action strategies. The basis for this is provided by individual Climate Action Plans, as presented in the Framework. In just a few steps, it is shown how each building comes to its concrete action plan, which is the most economical way to achieve carbon neutrality by the year 2050 at the latest. The Framework also provides support for the concrete implementation and evaluation of the measures derived from the strategy and defines the framework for corresponding CO₂ reporting.

One tool that helps to make the path to carbon neutrality feasible is the *DGNB Certification System for Buildings in Use*. Whether for individual buildings or entire portfolios and as a transformation and management tool, it provides practical assistance in developing a sustainable and future-proofed real estate strategy. This enables more climate action and less risk of bad investments. Buildings that are already operating carbon-neutrally receive the DGNB Climate Positive award in addition to the DGNB certificate. This recognises the positive contribution that these buildings already make to achieving climate action goals.

[More information](#) [↗](#)





Felipe Faria, CEO,
Green Building Council Brazil

Big challenges require aggressive goals: in Brazil, Paraná State confirms its first step to transform 212 of its public buildings into NZEBs

GBC Brazil currently has 52 buildings registered for its Net Zero Energy certification. Those projects vary in size and use, including low-rise commercial buildings, residential projects (with off-site generation), homes, public and private schools, universities, cultural centres, distribution centres and industries. Despite this diversity, these projects have things in common:

- investments in energy simulations;
- experienced project teams to find the financial feasibility for a NZEB;
- high energy efficiency;
- excellency in energy management during operations;
- and on-site renewable energy generation that covers the entire consumption for a 12-month period.

Considering its good atmosphere and expectations regarding the Net Zero Energy discussion and GBC Brazil's credibility, the State Government of Paraná signed an MOU to create a Net Zero Energy Public Building Program, which will become part of the Government's Strategic Plan. The MOU was signed by GBC Brazil, the Secretary of Urban Development and Public Works, the public company responsible for assisting and enforcing municipal projects financed by the State (Paranacidade), and the Development Bank of the State (Agência Fomento Paraná).

The MOU will grant financial resources to retrofit 212 existing public buildings into NZEBs, all to be GBC Zero Energy certified. As a counterpart, GBC Brazil, supported by its member company Petinelli Engineering, donated the energy efficiency and renewable energy generation projects that will go on bid by the end of 2020. Petinelli is leading the execution of net zero energy buildings in the country.

More than 20 engineers spent four months visiting and auditing those buildings, including over 111,000 pieces of equipment. The energy efficiency strategies will reduce energy use by 52% in lighting systems and 33% in air conditioning. The majority of those buildings are public schools, but the City of Balsa Nova included more: the City Hall and Chamber of Deputy buildings; a Health Unit; public parks and public sport venues; the municipality landfill installation; and all public lighting systems (off-site generation).

Net Zero Energy Building transformation per City (on-site generation):

- City of Maringá, 35 public schools that uses 1,869,78 MW/h
- City of Paranavaí, 28 public schools that uses 0,867,16 MW/h
- City of Cascavel, 41 public schools that uses 1,503,46 MW/h
- City of Foz do Iguaçu, 31 public schools that uses 2,403,83 MW/h

City of São José dos Pinhais, 37 public schools that uses 0,972,12 MW/h

City of Fazenda Rio Grande, 33 public schools that uses 0,794,47 MW/h

City of Balsa Nova, 29 buildings that uses 0,284,08 MW/h

Net Zero Energy Public Lighting (off-site generation):

City of Balsa Nova, 2,111 lights and equipment that uses 1,401,30 MW/h

Considering the high quality of the energy efficiency projects and the financial arrangements and conditions provided by the State, the payback for each Municipality will be three years, with a positive cash flow since the contract's first year.

We expect these buildings to start operating with net zero energy in 2021 and the GBC Zero Energy certification will be concluded in 2022.

More than 100,000 students will be educated in a net zero energy building.

Advancing net zero in Canada means accelerating the adoption of aggressive carbon reduction strategies in new and existing buildings today. The Canada Green Building Council (CaGBC) has taken a leadership role, having developed a Zero Carbon Building (ZCB) Program that provides standards, education, and research to support the country's climate goals.

In 2017, CaGBC launched a made-in-Canada solution with the *Zero Carbon Building Standard* which helps direct design, guide retrofits, and verify that building operations are zero carbon. By the end of 2019, ten certifications were achieved, including *Mohawk College's The Joyce Centre for Partnership and Innovation* – the first to achieve certification for both design and operations. Momentum is building in 2020, with several dual certifications and more exciting projects on the horizon.

In March 2020, the Standard was updated based on discussions with industry stakeholders and learnings from dozens of real-world projects, including schools, multi-unit residential, commercial and industrial buildings. ZCB Standard v2 was designed to accelerate the adoption of zero carbon building practices by providing the industry with a zero carbon approach that works for almost any type of new or existing building.

ZCB Standard v2 balances the rigour needed to eliminate carbon with the flexibility to get more buildings to zero, faster. Updates focused on reducing and offsetting emissions for the building's entire life-cycle, including embodied carbon and refrigerants, and better ensuring the prudent use of Canada's clean energy resources through more stringent energy efficiency requirements. At the same time, the Standard provides more options for different design strategies and recognizes more options for carbon reductions.

We believe there is no time to waste or reason to wait on the road to zero. CaGBC's report *Making the*

Case for Building to Zero proves that zero carbon buildings are technically feasible, financially viable, and represent the best opportunity for cost-effective emissions reductions today. But getting Canada's built environment to zero by 2050 requires concerted effort and the support of government and industry.

Recently, CaGBC conducted a study to better understand the gaps in low-carbon knowledge and skills among Canada's building professionals. Entitled *Accelerating to Zero: Upskilling for Engineers, Architects and Renewable Energy Specialists*, the study follows a similar report looking at the skills gaps for construction trades. Both studies demonstrate that the building industry has work to do to ensure Canada can deliver zero carbon buildings at scale and they provide key considerations for governments and providers of education and training.

Investing in a low-carbon workforce will help meet the rising demand for zero carbon buildings – but it could also pave the way for a green economic recovery as Canada reopens after the COVID-19 shutdown. Green building is already a significant contributor to Canada's economy. Over 460,000 Canadians currently work in green building. In 2018, green building activity contributed approximately \$48 billion towards Canada's GDP – an increase of 50 per cent in just four years. With financial investment, the green building industry could get Canadians back to work and help reignite the economy.

CaGBC has called on the federal government to think green when it comes to recovery spending, and our zero carbon ambitions are front and center. CaGBC outlined its recommendations in *Ready, set, grow: How the green building industry can reignite Canada's economy*. Those recommendations include betting big on zero carbon, training the workforce, and removing barriers to fund low-carbon retrofits now. We believe that the economic recovery this health crisis has precipitated could be the tipping point we need to transition Canada towards zero carbon – an idea whose time has truly come.



Fin Macdonald, Manager,
Zero Carbon Building Program



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3

Empowering the design community

Decisions made early in the design process can determine a building's performance for its entire lifetime. Therefore, the design community have a critical role in ensuring that buildings are fit for purpose, resilient and provide the shelter and space needed without compromising the earth's resources.

From refurbishing and repurposing of existing buildings, using circular economy principles and designing integrated strategies to achieve net zero performance, building projects must be driven using carbon emissions as a performance metric as significant to the process as cost and time.

Architects and engineers from around the world are taking accountability for their

role in delivering net zero buildings through initiatives such as Architects Declare, Engineers Declare, 2030 Challenge, Better Buildings Partnership and others.

To build on these declarations, the London Energy Transformation Initiative (LETI) has developed a *Climate Emergency Design Guide* [↗](#) outlining the requirements of new buildings to ensure climate change targets are met - to help define 'good' and to set clear and achievable targets.

The climate emergency declarations signal that there is industry willingness. The thought leadership from initiatives like the climate emergency design guide demonstrate that design solutions exist. Now is the time to bring these into standard practice.

The role of the architect

The transition to Net Zero Carbon requires concerted actions from business leaders, governments and NGOs, supported by architectural practitioners, who also have a key role to play.

The role of the architect has naturally evolved due to the recent, industry-wide transformation underpinned by the global environmental challenges. Architects have gradually transitioned from having a tactical and executional role to a more proactive, resilient and visionary one.

The foundations of this new role include:

Embracing the power of collective action

Scale and time are the defining challenges for the net zero carbon agenda.

Effective collaboration is essential—not merely to bring different disciplines together, but to actively cross-pollinate expertise in order to arrive at new insights and solutions. Together, we must also hold ourselves accountable for the outcomes.

Delivering for the long term

Built environments we create can outlast a few generations.

Choosing low carbon materials and construction techniques, optimising resource management, designing for deconstruction, consistently tracking performance, closing feedback loops, and communicating with all the project stakeholders should form the basis of our design approach and advocacy.

Being accountable for the outcome

The actual performance must align with the predicted - otherwise, we forfeit.

Establishing performance benchmarks at design stage, and staying engaged with end-users throughout commissioning and post-occupancy evaluation, enables the net zero target to go from a design stage aspiration to a real-life measure - as seen in the example of [The Kathleen Grimm School, New York City's](#) [↗](#) first net-zero-energy school.

Understanding where the trade-offs lie

Achieving Net Zero Carbon is hard, and it won't happen overnight.

Architects not only need to visualise what this goal looks like, but they also need to better understand associated challenges. By doing so, they can employ their creativity and ingenuity to identify trade-offs between alternatives, and help the entire project team make better decisions by utilising more efficient and resilient design solutions.

Decisions we take today will define our impact in the decades ahead. We must, therefore, make the leap today – not only in the built environments we design and deliver, but also in the way we articulate the architect's role within the global industry and across sectors. Our advocacy should extend to inform policies and transform the global market.

Architects can be the standard-bearers in the fight for the future of our planet – but we must be bold enough to demand meaningful change, and inventive enough to make it a reality.

Author: Mina Hasman, Associate, Skidmore, Owings & Merrill LLP



Shaping attitudes towards net zero buildings

What counts as “leaving your mark” as a building designer is changing. Nowadays, architects, contractors, consultants and clients are looking at the bigger picture. What are these buildings really adding to the world? In this more critical age, the answer is CO₂.

This is why AESG has launched their Pathway to Net Zero – an application being applied free of charge to all design projects to provide insights into how clients can achieve better buildings.

We have signed WorldGBC's Net Zero Carbon Buildings Commitment because we really believe “it is our duty of care as designers towards people, towards the planet, to contribute towards net zero targets.” To ensure our projects are pushing the boundaries and that we are encouraging our clients to do the same, to drive forward people's understanding of net zero, and its ever-growing importance.

This tool enables us to do just that. It has been designed to provide design and engineering guidelines for how a new development could pursue a net zero carbon ambition – looking at embodied carbon as well as the operational carbon of the building.

Every stage of the design process offers opportunities to reduce energy consumption and emissions. At pre-concept design stage we are looking at how local climatic conditions influences passive design options, then how active systems can efficiently meet comfort needs, and how renewable energy can provide the balance.

Net zero it is quite a new concept within most markets and is not currently adopted as the industry

norm. That creates a lot of uncertainty which translates as risk, inhibiting people's desire to target net zero aspirations.

But through taking a whole life approach to developments, exploring new technologies, and not just approaching things as we have always done, net zero concepts are increasingly being embedded into our work.

In order to apply the new and latest technology, they need to have an affordable price range. Solar photovoltaic panels used to be considered expensive, but as demand increased the manufacturing practices became more efficient, and so the technology is now really affordable and is being installed on nearly all of our projects across the Middle East.

These trends, and with more leadership being demonstrated by businesses and cities setting ambitious targets and action plans, suggest net zero is becoming more and more commonplace.

A collaborative and coordinated effort from the whole industry is needed to achieve these high-reaching targets. Every part of the project team needs to be pushing in the same direction.

AESG is prepared to fight the good fight and is further arming itself and others with knowledge to help stimulate smarter ways of working, conducting research and looking into the wider issues that need to be considered. A recent report on urban resilience looked at the impact climate change is going to have on cities and how they should develop to be resilient to changes that are coming.

Because everyone must adapt to this new reality and prepare for a net zero economy.

Author: Phillipa Grant, Director, AESG





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We invite you to join us

WorldGBC invites everyone in the real estate sector, whether an investor, developer, owner, manufacturer, architect, designer or consultant, and representatives of national government, states and cities, to work with our global network, powered by our Green Building Councils, us and our partners to ensure that all our buildings, everywhere, are net zero carbon before 2050. These actions will ensure sustained change towards achieving the targets set out in this report long beyond 2050, in order to realise the full impact.

World Green Building Week (WGBW) 2020 is calling on businesses and governments to #ActOnClimate, with a collective call to action from the building and construction industry for bolder and more ambitious regulation to drastically reduce building-related emissions.

Contact your [local GBC](#) or WorldGBC to join us on this important journey.

ACT!ON

NET ZERO BUILDINGS

FOR COMMUNITIES

FOR THE PLANET

FOR ECONOMIES



#ActOnClimate
#WGBW2020

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21-25
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2020