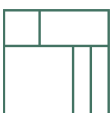


# DESIGNING WITH CARBON IN MIND





# Contents

WHAT IS CARBON?

04



THE CARBON CYCLE

06



WHY DO CARBON EMISSIONS MATTER

08



09

CARBON AND THE BUILT ENVIRONMENT



14

WHAT DOES CARBON NEUTRAL MEAN?

11

EMBODIED AND OPERATIONAL CARBON



15

HOW DO WE TALK ABOUT CARBON NEUTRAL FLOORS™?

12

WHY EMBODIED CARBON MATTERS

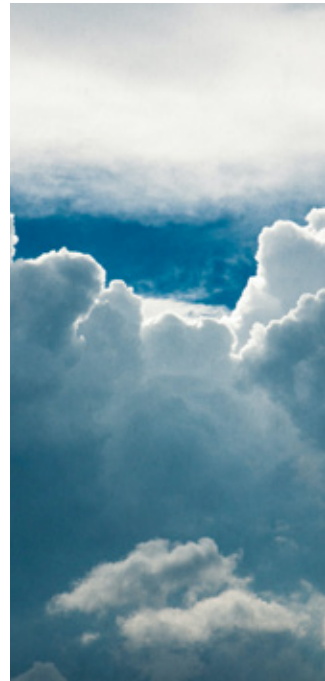


16

OUR APPROACH TO OUR PRODUCTS AND CARBON

20

WHAT MAKES A PRODUCT CARBON NEGATIVE?



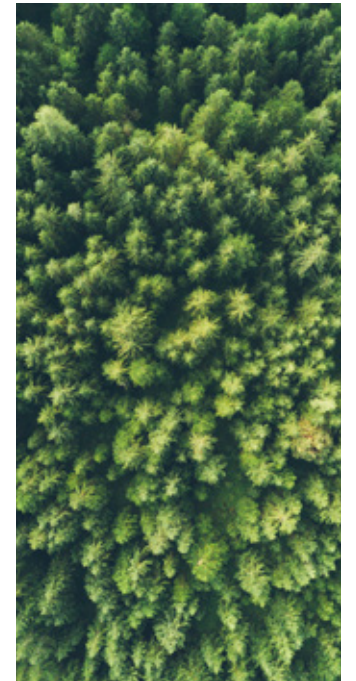
23

CQUEST™ CARBON NEGATIVE BACKINGS



24

STANDARDISING CARBON NEUTRAL TO MAKE CARBON NEGATIVE POSSIBLE



27

HOW YOU CAN DESIGN WITH CARBON IN MIND





# WHAT IS CARBON?

**Carbon is a chemical element and a universal building block for all life on earth.**

But the word 'carbon' is also used as a shorthand for carbon dioxide equivalents ( $\text{CO}_2\text{e}$ ), a measure of the emissions from various greenhouse gases based on their global warming potential (GWP), or carbon footprint.

When we refer to carbon at Interface, we focus on tackling carbon dioxide – a colorless gas produced by burning fossil fuels, such as coal, natural gas, and oil, and through breathing. Carbon dioxide is one of the most common greenhouse gases in the atmosphere.

Greenhouse gases trap heat and warm the planet. To slow the effects of global warming while preserving clean air and water, we need to develop a better understanding of carbon. Carbon is central to our sustainability mission, Climate Take Back® which aims to reverse global warming by running business in a way that creates a climate fit for life.



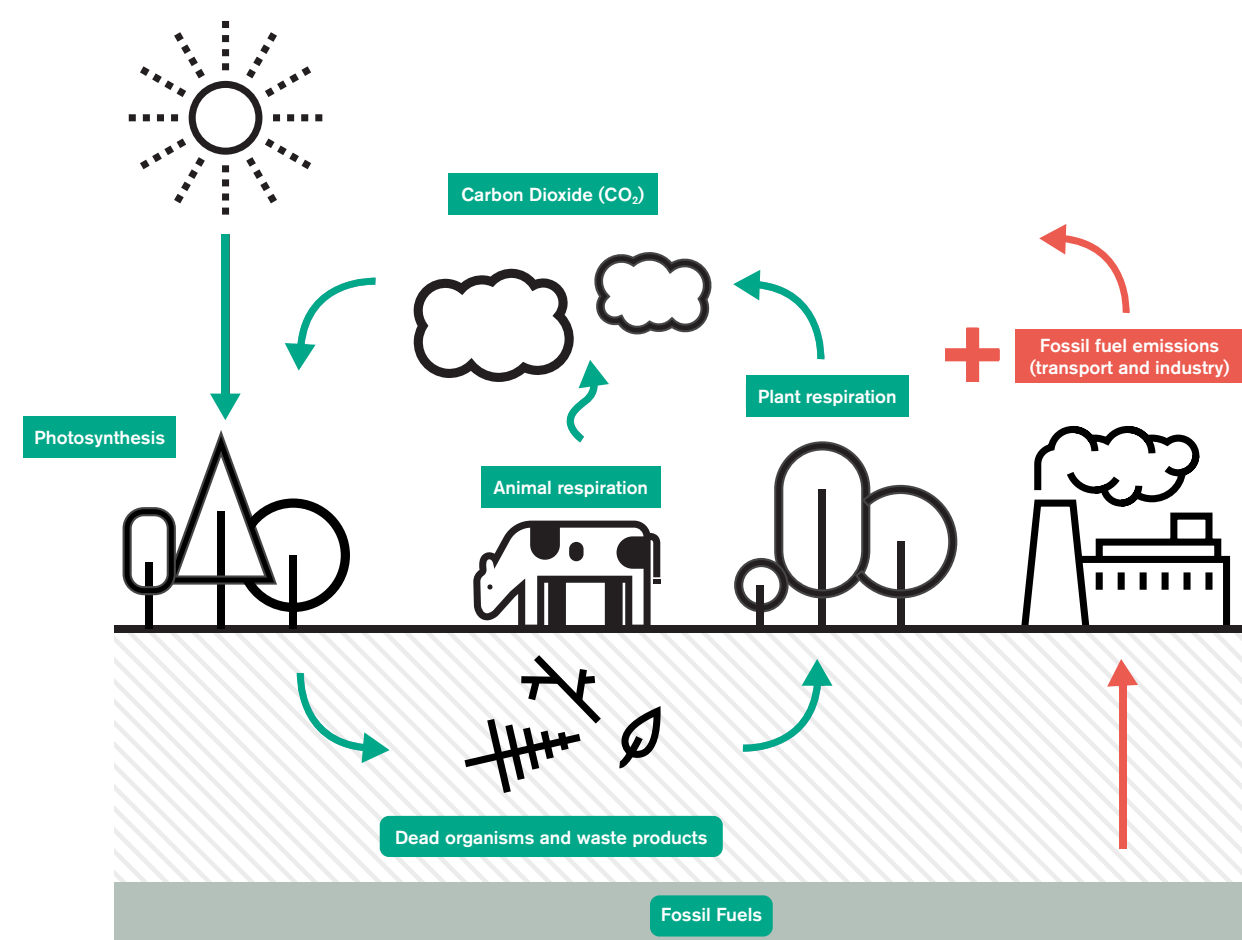


# THE CARBON CYCLE

To understand the science of global warming it is important to start with the carbon cycle.

The carbon cycle describes how carbon atoms continually travel from the atmosphere, to Earth and back again. Carbon dioxide in the atmosphere is absorbed by plants. The plants convert the carbon dioxide into oxygen and sugars, that they use to grow. Some of that carbon is eaten by animals and released through respiration. For the rest, when the plant dies, it decomposes releasing carbon dioxide back into the atmosphere, or forms fossil fuels over millions of years.

For thousands of years the carbon cycle worked in balance. However, for the last two hundred years our extensive use of fossil fuels has broken the carbon cycle and humanity has been putting too much carbon dioxide into the atmosphere. The carbon dioxide in the atmosphere acts like a blanket trapping the heat of the sun, raising the temperature and being the key cause of global warming.



# WHY DO CARBON EMISSIONS MATTER



We see the impact of a broken carbon cycle and global warming regularly reported in the news:

- Higher annual average temperatures
- More extreme weather patterns
- Ocean acidification



It is an international issue and the Paris Agreement (COP21) in 2015 saw a landmark agreement reached to combat climate change and to accelerate and intensify the actions needed for a sustainable low carbon future. Governments from around the world agreed to keeping a global temperature rise this century well below **2 degrees** Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. In recent years, we have seen a significant number of countries and the European Union pledge to reach net zero emissions by **2050** or sooner.

As a follow-up to the Paris Agreement (COP21), the Intergovernmental Panel on Climate Change (the IPCC) reported on the world's progress in 2018. Their report stated that we had until 2030 to change our ways on carbon emissions or we would pass an irreversible tipping point. That action was needed now.



## CARBON AND THE BUILT ENVIRONMENT

According to the World Green Building Council the building and construction industry is responsible for **39%** of all carbon emissions in the world.

This represents a huge challenge to the industry, but also an opportunity – as reductions made by the built environment have the potential to contribute significantly to tackling global warming and promoting a green and inclusive recovery.

For the last decade, great strides have been taken to reduce operational carbon - the emissions related to the use of a building. Many companies have pledged to reduce the energy usage of their buildings. Standards such as **LEED** and **BREEAM** have been pivotal to driving this change.

**LEED and BREEAM**

An increasing number of companies pledging to reduce the carbon footprint of their buildings.





# EMBODIED AND OPERATIONAL CARBON

## OPERATIONAL CARBON

**Operational carbon** is the carbon emitted during the in-use phase of a building. These are energy focused - associated with heating, hot water, cooling, ventilation and lighting. For our flooring products this includes cleaning and maintenance.

## EMBODIED CARBON

**Embodied carbon** is the carbon footprint related to the production of a material. For a manufacturer, this includes emissions related to the raw materials through to the manufacture of the product itself. Also known as "cradle to gate".

## WHOLE LIFE CARBON

**Whole life carbon** is the combination of embodied and operational carbon – a total of all carbon emissions resulting from materials, to construction, use of a building over its entire life including its demolition or disposal.



# WHY EMBODIED CARBON MATTERS

Although progress has been made on reducing the operational carbon, it is only in recent years that the focus has shifted to tackling embodied carbon too. Research from Architecture 2030 has highlighted that embodied carbon will be responsible for almost half of total new construction emissions between now and 2050. Whilst operational carbon emissions can be reduced over time with building energy efficiency renovations and the use of renewable energy, embodied carbon emissions are locked in place as soon as a building is built. In short, embodied carbon has been a blind spot for the built environment.

**At Interface we have been collaborating with partners on initiatives to address this:**

## materialsCAN

materialsCAN is a network of organisations that are ready to act on the smart prioritization of embodied carbon in building materials. The working group currently includes stakeholders from across the built environment including Interface, Gensler, Skanska, Kingspan, Armstrong, CertainTeed, USG, and Superior Essex. The group aims to provide those who own, lease, design, or construct spaces with education and tools to better understand the carbon footprint of their projects, specifically through measuring the embodied carbon of specified materials.

## EC3

With embodied carbon becoming an increasingly important issue for the construction industry, the next step is to ensure its measured and made comparable. Interface were a lead sponsor of the Embodied Carbon Calculator for Construction (EC3) created by Skanska, Microsoft and the University of Washington's Carbon Leadership Forum.

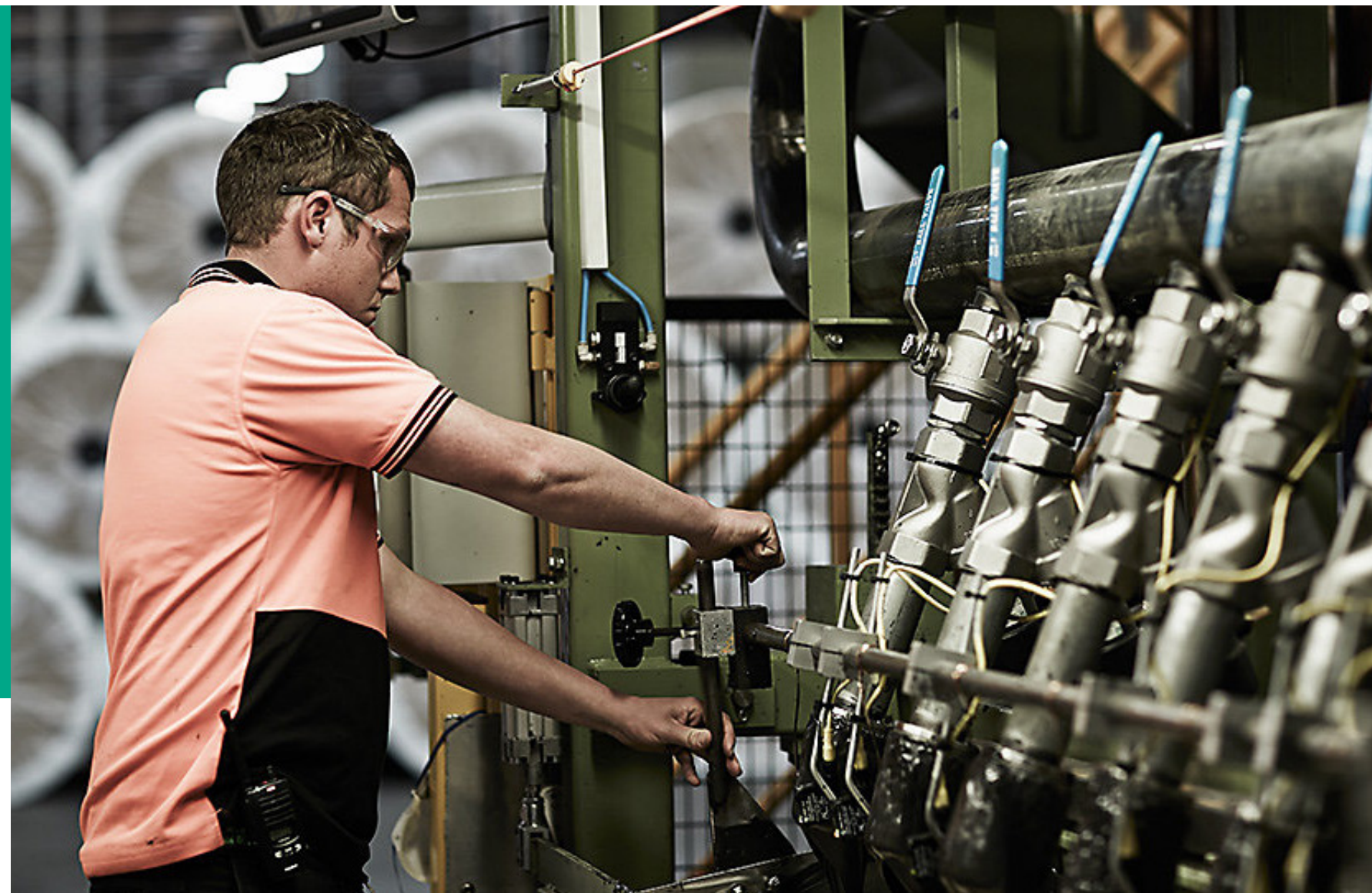
EC3 highlights low-carbon providers and products. It allows architects, designers, builders, manufacturers and auditors to search construction materials by performance, location and global warming potential in a public searchable database based on environmental product declaration (EPD) data. Ultimately, EC3 will help construction professionals efficiently quantify, report, and reduce embodied carbon.





# WHAT DOES CARBON NEUTRAL MEAN?

This is when the amount of carbon emitted in the atmosphere is equivalent to the amount of carbon removed or avoided, creating a net-zero impact. Achieving carbon neutrality is the only way manufacturers and companies can make sure they are not contributing to a warming planet.



## HOW DO WE TALK ABOUT CARBON NEUTRAL FLOORS™?

The flooring products that we sell – carpet tile, LVT and nora rubber sheets and tiles – are carbon neutral across their full product life cycle. We follow the globally recognized GHG Product Life Cycle Accounting and Reporting Standard and have our program audited annually by an independent third party.



# OUR APPROACH TO OUR PRODUCTS AND CARBON

## STEP 1

### Reduction to Carbon Neutral Floors

We know the impact our flooring has on our planet, whether carpet tiles, LVT or nora® rubber flooring. It's not just heating and cooling buildings that adds to carbon emissions, but the materials and processes used to create and maintain them. And that includes flooring products.

Reducing this 'embodied carbon' is the most urgent challenge of all. Since 1994, we've been leading our industry in reducing the carbon footprint of our products to become the lowest in the industry through their full lifecycle. And we offset the emissions we still can't avoid by purchasing carbon-offsets from projects in renewable energy, fuel switching and reforestation, to keep carbon in nature and actively removing it from the atmosphere.



# 76%

INTERFACE HAS REDUCED  
THE CARBON FOOTPRINT OF  
OUR CARPET PRODUCTS BY  
76% SINCE 1996.





## STEP 2

### Introducing carbon negative materials

However, whilst Carbon Neutral Floors enabled us to mitigate the negative impact of our products, the next step to explore was how we could have a positive impact in tackling global warming. In particular, introducing carbon negative materials, whose footprint was restorative.

Guided by materials science, we've added new thinking and innovative new materials to make backings with a much lower carbon footprint. First, we added new bio-based materials, and more recycled content to our backings. This approach uses carbon in the atmosphere as a building block, to make raw materials and products. Like trees and plants, we can 'store' carbon, separating it from the atmosphere, transforming it in a more circular way into something useful.

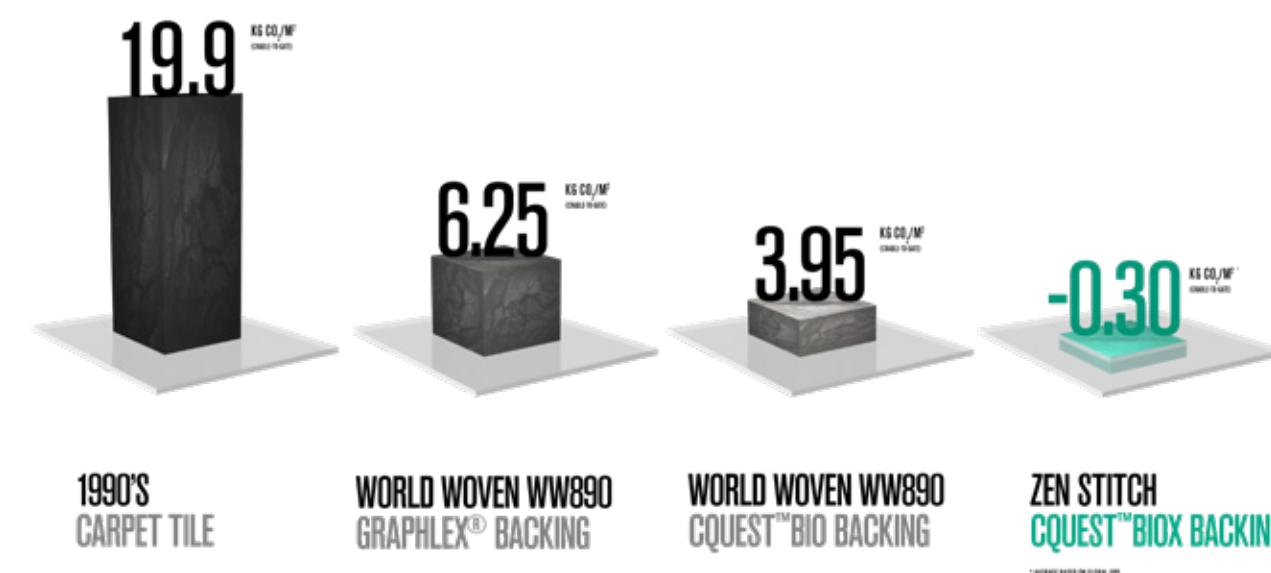
These responsibly-sourced materials use the power of nature to store carbon in a stable and durable form. When measured on a standalone basis, these materials are net carbon negative. Helping to control carbon emissions by keeping carbon stored in our products and out of the atmosphere.

By combining these materials with the use of high levels of recycled content we are able to significantly reduce the carbon footprint of our products. In addition, we are able to get closer to turning off the tap to the use of fossil-fuel derived materials, keeping these carbon intensive materials to a minimum.

CQuest™Bio backing is standard across all products manufactured in Europe. CQuestBio lowers the carbon footprint of our carpet tiles by an average of 33%. The average recycled and bio-based content of our carpet tiles with CQuestBio backing is 88%.

## STEP 3

### A carbon negative product





# WHAT MAKES A PRODUCT **CARBON** **NEGATIVE?**

When the manufacture of a product stores more carbon than it emits, the product is carbon negative. The carbon negative materials in the CQuest™BioX backing, in combination with specialty yarns and tufting processes, results in a carbon negative carpet tile.

**The finished product brings together durability, industry-leading design, and a negative carbon footprint that ultimately benefits the planet.**

## CARBON SEQUESTRATION

Carbon sequestration is a method of carbon capture and the long-term storage of atmospheric carbon dioxide. This prevents it from being released into the atmosphere and contributing to global warming. The carbon negative carpet tile is designed with materials that store carbon within the product, rather than releasing it into the atmosphere. The carpet is designed so it can be recycled into new product, which means the carbon contained in the product is reused and once again sequestered.

## CLOSED LOOP MANUFACTURING

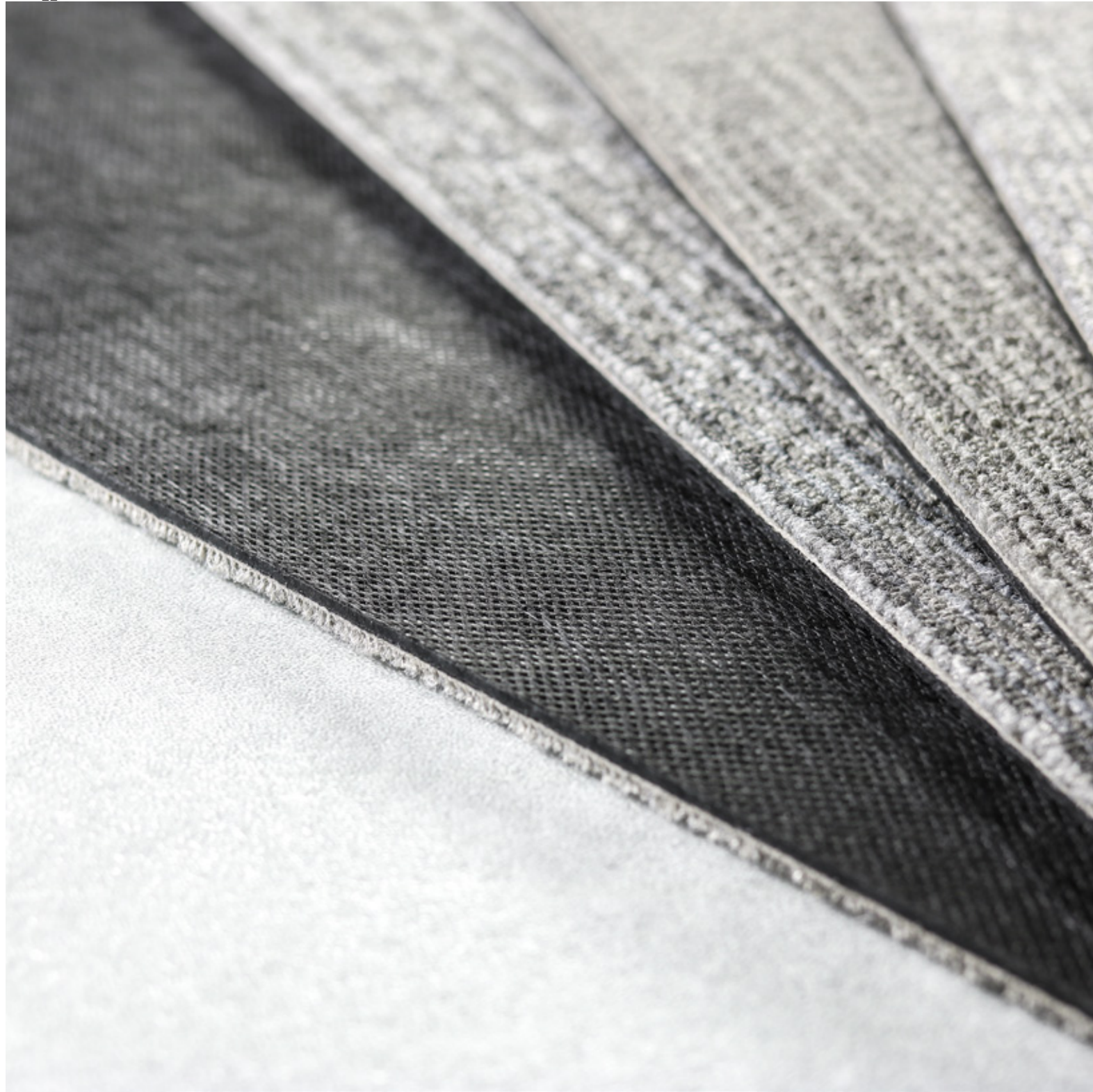
We recycle manufacturing waste and used flooring back into new flooring, closing the loop on materials. This conserves natural resources, diverts waste from the landfill, and reduces the carbon released into the atmosphere.

## CIRCULAR ECONOMY

The traditional linear economy follows a pattern of 'make, use, dispose'. The circular economy keeps resources in use for as long as possible, extracts the maximum value from products in use, then recovers and regenerates products and materials at the end of life.







# CQUEST™

**We are on a mission to lower the carbon footprint of our customers space. In order to do this, we are transforming our global backing systems with the launch of our new CQuest™ backings.**

Guided by materials science, we've added new thinking and innovative new materials to make backings with a much lower carbon footprint – away from the status quo and toward carbon negative.

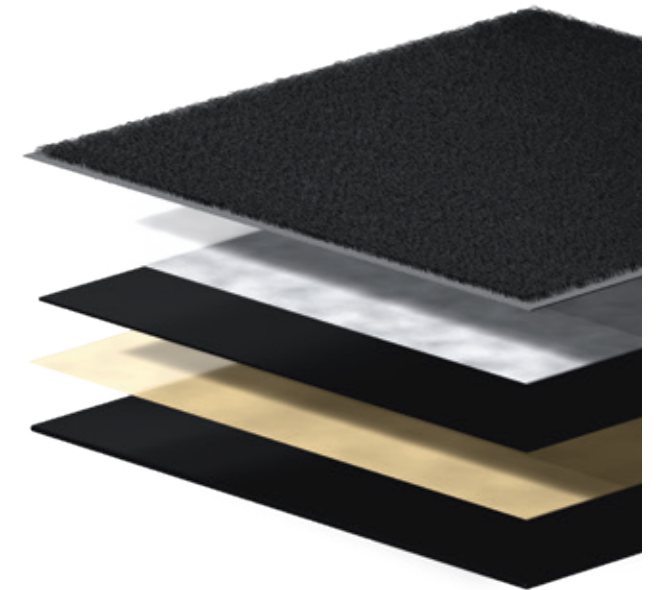
First, we added new bio-based materials, and more recycled content to our backings. Then, we measured how these materials influence the carbon footprint. These new materials, measured on a stand-alone basis, are net carbon negative reducing our carbon footprint.

## CQUEST™BIO

A non-vinyl bio-composite backing made with bio-based and recycled fillers which are net carbon negative.

## CQUEST™BIOX

Our backing that stores the most carbon. It's the same material make-up as CQuest™Bio with a higher concentration of carbon negative materials.



*CQuest™ carbon negative backings, layered with: tufted carpet into the primary backing; a pre-coat; backing compound; stabilizing glass tissue and a final backing compound.*

**Note:** Carpet tiles made with CQuest™Bio does not have a negative embodied carbon footprint, are carbon neutral throughout their full product life cycle through our Carbon Neutral Floors™ Program.



# STANDARDISING CARBON NEUTRAL TO MAKE CARBON NEGATIVE POSSIBLE

**Our path towards carbon negative and carbon-neutral products is just one part of Climate Take Back®, our mission to reverse global warming.**

The flooring products that we sell – carpet tile, LVT and rubber flooring – are carbon neutral across their full life cycle. In 2021 we launch our first carbon negative carpet tile, the most environmentally friendly product we have ever made.

For the full life cycle, embodied carbon is combined with operational carbon. Though the embodied carbon for these new products is net negative (cradle-to-gate), the total life cycle still has a carbon footprint because of operational carbon. To remedy this, we purchase carbon offsets to make our flooring carbon neutral.

Our carbon negative products will be carbon negative from cradle-to-gate. And the operational carbon will be offset through the Carbon Neutral Floors™ program. This aims to keep the entire life cycle of our products carbon neutral.







# HOW YOU CAN DESIGN WITH CARBON IN MIND

We hope that the approach we have taken has given you food for thought. But we cannot reverse global warming alone, we need your help, there are a number of steps you can take to design with carbon and the climate in mind.

## 1. Designers & Architects

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- Reuse existing products and materials
- Once decided it's needed – what is the carbon footprint of it and are there lower footprint options available?
- Optimize choices: Do we need it? Do we need as much of it?
- Specify for carbon reduction

## 2. Contractors

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- Don't be afraid to speak up and educate design firm and owners as early as possible on the impact of embodied carbon
- Consider carbon footprint alongside cost
- Smart procurement – suggest options that save emissions and don't sacrifice performance or cost
- Engage in policy discussions and opportunities
- Inform, educate, and encourage

## 3. Manufacturers

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- Obtain and utilise Life Cycle Assessments
- Target highest carbon impacts for footprint reductions
- Source renewable energy for manufacturing process, same for supply chain
- Commit to recycle carbon intensive materials
- Work with product development teams to ensure carbon footprint is a consideration for development process





Carbon Neutral Floors™

**Europe, Middle East & Africa**

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