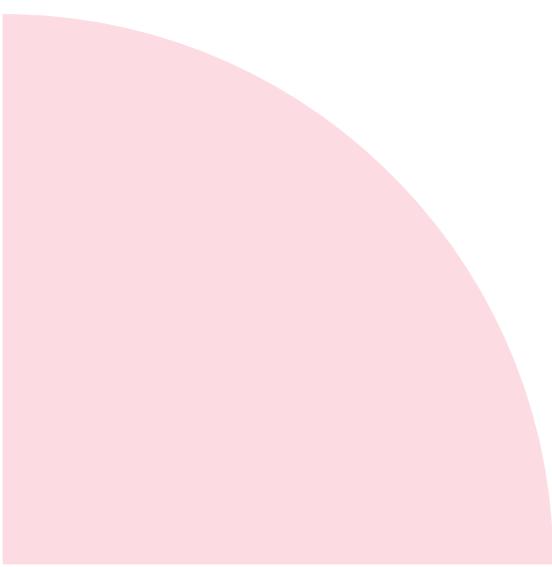




5 Reasons for Interior Designers and Architects to Use Sustainable Materials



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Introduction

BUILDING A BETTER FUTURE

A new eco-conscious mindset is emerging, which demands a new way of creating by architects and designers.

The circular economy is a radical departure from the current 'take, make, waste' model. It's a system that revives natural ecosystems, creates value for people and gives businesses a competitive edge.

Green design is fundamental to our evolution toward a circular economy. A circular economy is the foundation of a sustainable society – one which minimizes the use of virgin resources, does not pollute our environment, protects human health, is regenerative where we have done prior damage, and brings us back to a more reasonable and sustainable use of our finite resources.

This is one of the most important and exciting design challenges of our time.

“Sustainable design shouldn't be seen as just a technical fix, a matter of paying the right consultant enough money to make sure the building ticks enough boxes, or of buying the most magical available piece of cooling technology. It should rather be integrated into the art of architecture. The ideal is that it should help buildings be all round better, longer-lasting, more pleasurable, more beautiful...”⁴

—The Guardian

To make a real impact and move green design forward, we must look at the way we design the built environment.

Did you know that buildings generate nearly 40% of annual global CO2 emissions? More emissions are forecasted as global building supply is expected to double by 2060 to accommodate unprecedented urban growth.¹

We can be part of the solution.

According to Lance Hosey, FAIA, LEED Fellow and Design Resilience director for Gensler, studies show that designers and architects can impact up to 90 percent of a project's eventual impact based on the earliest design decisions.²

Can we challenge ourselves to create structures that balance beauty, functionality, wellness and care for our environment?

We believe we can.

It is our responsibility to build a better future. We must strive to preserve the integrity of our planet for future generations.

It's not only the right thing to do, it's the smart thing to do.

A meta-analysis by the University of Oxford finds that 88 percent of reviewed studies show companies with robust sustainability practices demonstrate better operational performance; and 80 percent of reviewed studies showed that prudent sustainability practices have a positive influence on investment performance.³

In this eBook we provide a compelling overview of how your firm can benefit from implementing sustainability practices in your projects, without compromising aesthetics and/or economic feasibility.

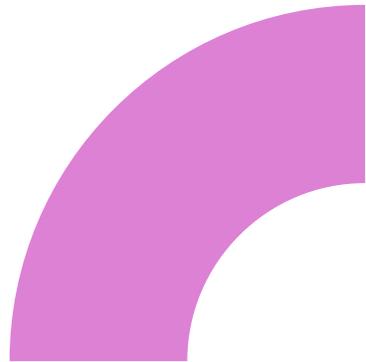
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The Green Building Challenge

There is a legacy of misconceptions we need to address, and a re-education we need to undertake if we are going to move the industry forward.

CHANGING MINDSETS

First, we need to adjust our mindsets.

For too long, we have held on to outdated notions that sustainable materials are too expensive, it is too time-consuming to do the research, it is too difficult to get the certifications, the materials are not creative enough, not flexible or durable enough, and that our clients simply 'aren't tree huggers'.

The reality is that advances in technology and focus on sustainable design have helped address each one of these issues, and the green building sector is growing.

The number of LEED-certified projects in the United States rose from 296 certifications in 2006 to over 67,200 in 2018.⁵

BREEAM has issued 600,695 sustainability certificates across 92 countries worldwide.⁶

AESTHETICS

Can sustainable projects be beautiful and economical?

When selecting materials architects and interior designers (and consumers) are usually more aware of aesthetic and cost considerations than what a material contains or where it comes from.

Originally, the concept of sustainability promised to broaden contemporary design by adding ethics to aesthetics, but many designers feel ethics has taken center stage. Because standards of sustainable design appeared to emphasize ethics over aesthetics, many designers and critics have complained that it lacks inspiration.

But the green design market is changing, and sustainable materials are gaining importance. The popularity of sustainable materials has grown in the last decade.

As the green agenda becomes more popular, designers are realizing that sustainable design doesn't mean limited design.

A well styled space is the result of new products blended with well-curated, old, and reused/ recycled pieces. With the development of new technologies and manufacturing processes, there is no need to sacrifice aesthetics for sustainability or vice versa.

For example, floors made from bamboo are produced with minimal environmental impact and can be just as durable and aesthetically pleasing as wood floors. Floors covered by carpet made from ECONYL[®] regenerated nylon fibers have the same performance as virgin nylon carpet and can support any type of creative designs.

Design is absolutely critical to sustainability. If we don't design things that people love, they will be discarded, further exacerbating our waste problem. However, if we create beautiful projects that move and inspire us, they will be treasured and preserved.

COST

One of the most common misconceptions about green building is that it's too expensive.

In a 2008 survey of over 700 construction professionals, 80 percent cited "higher first costs" as the biggest obstacle to green building.⁷

In reality, green building can actually cost less than conventional construction.

This is especially true if we look at the life-cycle cost of a building and consider all costs generated by the construction, operations, and maintenance over its expected useful life. Higher initial costs are often offset by a decrease in long-term life cycle costs.

A great example is the San Francisco Federal Building, which opened in 2007. By relying more on natural light and outdoor fresh air, the project saved \$11 million in mechanical cooling with a total construction cost that is 13.5 percent below the market average.⁸

A majority of green buildings analyzed in the book *Greening Our Built World* are between 0–4 percent more expensive than conventional non-green buildings. Some of the greenest buildings have been built for between 0–2 percent variance of the cost of a regular project.⁹



Five Key Reasons for Integrating Sustainable Materials

I. CLIMATE CHANGE

The impacts of global climate change that scientists predicted are occurring now: loss of sea ice, accelerated sea level rise and longer, more intense heat waves.

According to NASA, in many regions, warming has already surpassed 1.5 degrees Celsius above pre-industrial levels. More than one-fifth of all humans live in regions that have already seen warming greater than 1.5 degrees Celsius in at least one season.

It doesn't seem like a lot, but small changes in temperature can create significant changes to our environment. (See figures 1-4 on page 8.)

Buildings are responsible for one-third of the world's greenhouse gas emissions, so green building and design represents a critical part of the solution to help mitigate emissions, stemming the negative impacts of climate change.

Using sustainable materials offers several environmental benefits: reduced energy use, lower greenhouse gas emissions, protection of natural resources, water-use reduction, improvement of air quality, and waste reduction.

When evaluating materials, interior designers and architects should adopt a life-cycle perspective that considers all of the environmental impacts generated by every phase of the production, use, and disposal of materials. This allows us to take into account both direct impacts (e.g., quality and quantity of energy consumption, process efficiencies, emissions) and indirect impact for producing raw materials.

The Aquafil Group, producer of ECONYL[®] nylon and the author of this eBook, is a great example of a company taking action to effectively reduce their carbon footprint.

ECONYL[®], an Aquafil flagship product, is a nylon that comes from waste material instead of oil. As well as developing a new reverse logistics system to recover waste all over the world, Aquafil is also trying to improve their recycling process to produce ECONYL[®] regenerated nylon with less and less impact.

CARBON FOOTPRINT 2011-2018 TREND TO PRODUCE 1KG OF ECONYL[®] YARN

Information coming from the EPD of the nylon textile yarn ECONYL[®] S-P-00278



Figure 1

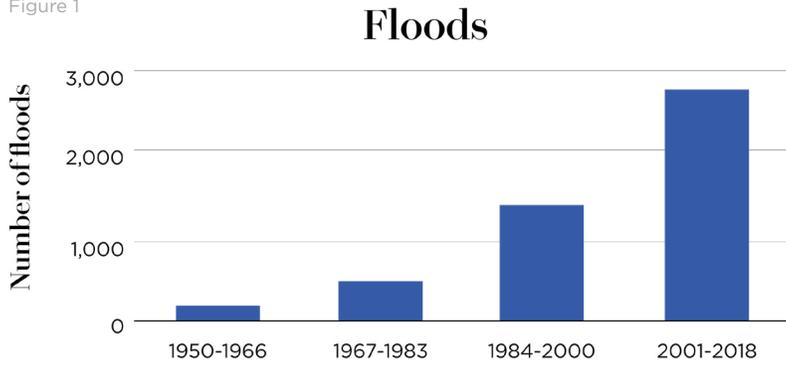


Figure 2

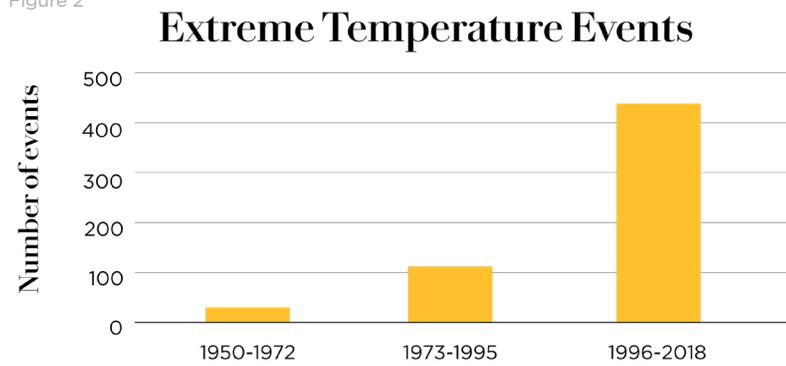


Figure 3

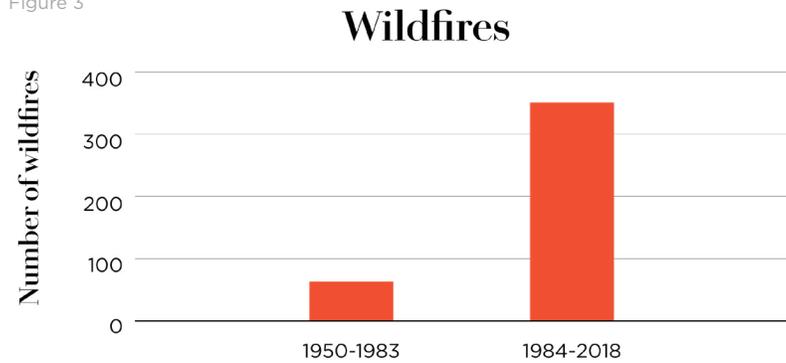
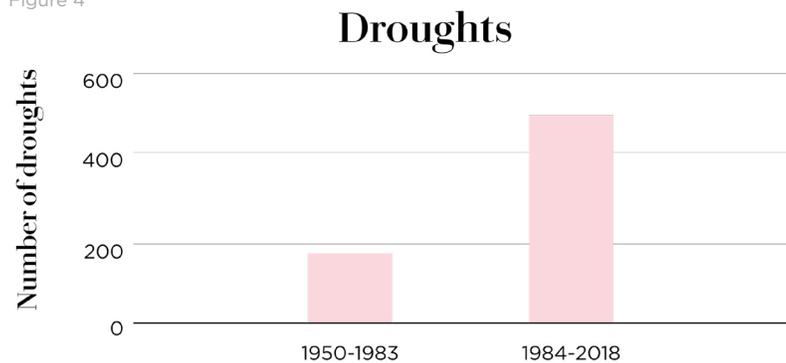


Figure 4



II. WELLNESS: THE HUMAN EXPERIENCE

Wellness standards are positively influencing the industry, by focusing on the health and quality of the structure's occupants. Architects and designers have a real impact on human health, well-being and productivity, as they define how people will experience built environments.

On average, people spend 90% of their time indoors. But indoor air can be 2 to 5 times more polluted than outdoor air.¹⁰

Given we spend an average of eight hours each day at work tied to our desks, creating active built environments for offices, including considerations for air and water quality, physical layouts for mobility and lighting are critical to wellness.

More and more commercial building owners including multi-family properties, hotels and workplaces are focused on wellness. It impacts the customer experience, lifestyle and productivity.

[Recently, the U.S. Green Building Council \(USGBC\) reported that employees are happier, healthier and more productive in LEED green buildings.](#)

The international **[WELL certification](#)** standard is focused on advancing health and well-being in buildings through a framework for improving health and human experience through design, including physical and mental well-being.

It has been adopted by 33,681 projects encompassing over 3.15 billion square feet are applying WELL across 109 countries and its reach is growing.

Focusing on wellness poses a great opportunity for architects and designers to add value to their projects, the people who inhabit them, and our society at large.



Learning + Innovation Center, München; Photo: Steelcase



KEY FINDINGS FROM A U.S. GREEN BUILDING COUNCIL SURVEY ABOUT WORKING IN GREEN BUILDINGS

93%

of those who work in LEED-certified green buildings say they are satisfied on the job.

81% of those who work in conventional buildings say the same.

Of these respondents, 85% feel their access to quality outdoor views and natural sunlight boosts their overall productivity and happiness.

More than 80% of all employees say being productive on the job and having access to clean and quality indoor air contributes to overall workplace happiness.

80%

79%

of all employees say they would choose a job in a LEED-certified building over a non-LEED building.

Based on their experience with LEED-certified buildings, 81% agree the enhanced air quality improves their physical health and comfort.

81%

84%

of all employees prefer to work for a company that has a strong concrete mission and positive values.

III. SHIFTING REGULATORY ENVIRONMENT + INCREASING INCENTIVES

Many countries and municipalities are regulating and promoting green design projects through the use of financial or tax incentives, with even more expected to do so in the coming years. There are several types of policies taking place around the world. One of the more common practices is governments setting mandatory environmental requirements for government buildings.

Next, we explore two examples of advances in policy taking place in the U.S. and Europe.

THE U.S.

Federal, state and local governments across the United States have begun to embrace green design and construction.

Many cities across the country have moved to individually implement green building goals over the past few years. For instance, last year 19 mayors pledged that every new building constructed in their cities will meet net-zero standards by 2030—and by 2050, all buildings will be retrofitted to meet those same standards. In 2017, New York City announced a plan to require about 23,000 buildings in the city to cut emissions by about a quarter by 2030. In 2018, Washington, D.C. passed a bill that would see nearly half of its buildings retrofitted to reduce energy emissions by 2032.

At least 15 States, including California, New York and Washington, now have green building laws, requiring that new buildings and major renovation projects adhere to a set of sustainability guidelines. These usually include pre-established levels for energy use, goals for further reductions in energy use, required alternative energy off-sets, and waste management intended to reduce solid waste and landfill.

The United States does not have a unique federal certification program for green building, so in establishing guidelines and legislation requirements, governments usually refer to international standards and voluntary certifications.

One of the most recognized is the LEED (Leadership in Energy and Environmental Design) standard that provides third-party verification that a building was designed and built using strategies aimed at improving environmental performance and reducing waste. Since 2009, the federal government requires that all new

construction and renovations meet LEED equivalent guidelines for energy reduction and recycling, while the U.S. General Services Administration “Design Excellence” program establishes that all projects designed after 2003 must aim for a LEED Silver rating and must meet LEED certification level standards.

Concerning interior design and construction, the newest version of LEED (v4.1) promotes the use of sustainable materials by giving credits to those projects in which recycled materials are specified.

In early 2019, Representative Alexandria Ocasio-Cortez and Senator Ed Markey introduced a policy framework for the Green New Deal, which would invest in a strong workforce, green building and energy technologies, transit, and education.

One of the goals of the Green New Deal is to upgrade all buildings in the U.S. to green standards. Should this legislation pass, it will have a significant impact.



CALIFORNIA LEADS THE WAY IN TACKLING CARPET WASTE

According to the U.S. Environmental Protection Agency, more than 4 billion pounds of carpet ends up as waste in the U.S. every year and it represents between two to three percent of materials filling American landfills.

One way to address this crisis is through legislation and incentives.

In 2010, California became the first state in the U.S. to pass legislation focused on increasing carpet recycling.

Thanks to carpet recycling programs created by this legislation, infrastructure continues to increase with more drop-off sites and recyclers available throughout the state than ever before.

Today, there are more than 170 drop-off sites available to receive used carpet, decreasing the amount of carpet waste in California's landfills. This network includes more than 55 public drop-off sites, which accept used carpet free of charge.

Since 2011, one billion pounds of carpet has been collected by members of CARE's California Carpet Stewardship Program.

Aquafil USA was a key supporter of California's carpet recycling legislation and participates on the board of Carpet America Recovery Effort (CARE).

Aquafil USA opened a carpet recycling plant in Phoenix, AZ in 2018 and another location in Woodland, CA in 2019. Both recycling plants have the capacity to recycle up to 36 million pounds of carpet each year.

The California Carpet Stewardship Program reports that:

- In the past five years alone, 292 million pounds of discarded carpet was kept out of California landfills
- To date, California has reduced the equivalent of 416,461 metric tons of carbon dioxide
- California Carpet Stewardship saw increase from 10% carpet recycling in 2015 to 21% in 2020, which is equivalent to growth of more than 20% per year on average

All legislative efforts are meaningful, but even more needs to be done. Only 1 percent of carpet can be recycled back into carpet again. Currently, carpets are being down-cycled and the great majority of carpet waste still ends up in landfills. Besides the fact that carpet is environmentally damaging, we have proven waste is a very precious material that we cannot ignore. We must tap into waste to reuse and transform into a brand-new resource.

Other states in the U.S. considering carpet recycling legislation include: Illinois, Massachusetts, Minnesota, and New York. We hope to see legislation continue to be passed across the country to spur innovation, increase recycling and the creation of more eco-conscious materials available to the design-build community.

EUROPE

The construction and refurbishment of buildings in an energy and resource efficient way is an important policy objective for Europe. The recast Energy Performance of Buildings Directive, the Renewable Energy Directive, and the Energy Efficiency Directive, together set out requirements for buildings that contribute towards ambitious EU targets for energy efficiency and renewable energy generation.

A European Commission report on green building highlights that the use of materials with high recycled content has the potential to make a significant impact on resource efficiency in construction. Adopting more re-used and recycled material in construction helps divert materials from landfills and conserves natural resources.¹¹

As a Green Public Procurement Core award criterion, it has been proposed that points be allocated in proportion to incorporation of the recycled content and/or industrial by-products greater than a minimum of 15% by value into a building's main elements and the most relevant finishing elements, including:

- Ceiling tiles
- Textile floor and wall coverings
- Laminate and flexible floor coverings
- Wooden floor coverings

Further, President-elect of the European Commission, Ursula von der Leyen has laid out an agenda to have Europe lead real action on climate change by becoming the world's first climate-neutral continent by 2050 through a comprehensive reform package – a European Green Deal.¹²

The proposal includes a biodiversity strategy for Europe, an extended emissions-trading system and a tax to avoid carbon 'leakage' – when companies transfer the production of goods to countries with more relaxed emission limits.

Proposed funding includes €1 trillion (US\$1.1 trillion) over the next decade for climate investment, and to turn

parts of the European Investment Bank into a dedicated climate bank, which would channel private investment to climate and clean-energy projects.

This is a bold vision, and the European Union (EU) had started this journey with its Circular Economy Action Plan, which it adopted in December 2015.

The Circular Economy Action Plan focused on “closing the loop” of product lifecycles through greater recycling and re-use, creating benefits for both the environment and the economy. Elements of the action plan include measures to address reduction of food waste, recycling targets, landfill waste reduction, increased production of green products and water reuse.¹³

Europe has been viewed as a leader in climate-protection efforts and if the Green Deal moves forward, it appears Europe is poised to continue setting the standard for sustainable development if it adopts a European Green Deal.



Ursula von der Leyen, President-elect of the European Commission

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13. European Commission, Factsheet: An ambitious EU Circular Economy Package. 2 Dec. 2015. https://ec.europa.eu/commission/publications/ambitious-eu-circular-economy-package_en

IV. REPUTATIONAL VALUE

Focusing on eco-design and sustainable materials can provide firms that do it right with a competitive advantage. Interior designers and architects should take the lead to promote sustainable practices to differentiate their firms from the competition that is lagging behind.

Evidence shows consumers prefer products from sustainable-minded businesses over the alternative. Establishing a sustainable practice improves brand image and using sustainable materials proves a brand's commitment to the environment.

Nielsen, a global measurement and data analytics company, cites a survey that shows 81 percent of global respondents feel strongly that companies should help improve the environment.¹⁴

While the demand for eco-conscious products, services and companies is prevalent, so is 'greenwashing'. Consumers are watchful of companies that try to falsely represent their sustainability claims. Being truthful about your company's practices is essential. Trying to greenwash in any way will actually hurt your reputation.

Truly investing in sustainable practices and products can enhance brand value. After launching its Ecoimagination initiative focused on sustainable practices in 2005, GE saw an increase in its brand value by more than USD \$6 billion. The company was able to move ahead of its competitors Siemens and Phillips by leading the dialogue.¹⁵

In the architecture and design community, firms are investing in sustainable practices and talent. Gensler has a team dedicated to [Design Resilience](#), HKS has a [Sustainable Design Team](#), and the Federal General Services Administration (GSA) in the U.S. is a major owner that demands sustainable projects.

If your practice has not yet adopted sustainability in the way it works, could it get left behind?

V. SUSTAINABILITY = GROWTH + ROI

Sustainability is mission critical for business success today and into the future.

“The era of corporations integrating sustainable practices is being surpassed by a new age of corporations actively transforming the market to make it more sustainable.”

—Stanford Social Innovation Review

A report published by Stanford University shows that more than 90 percent of CEOs state that sustainability is important to their company’s success.

This trend will not abate anytime soon. Surveys show that 88 percent of business school students think that learning about social and environmental issues in business is a priority, and 67 percent want to incorporate environmental sustainability into their future jobs.¹⁶

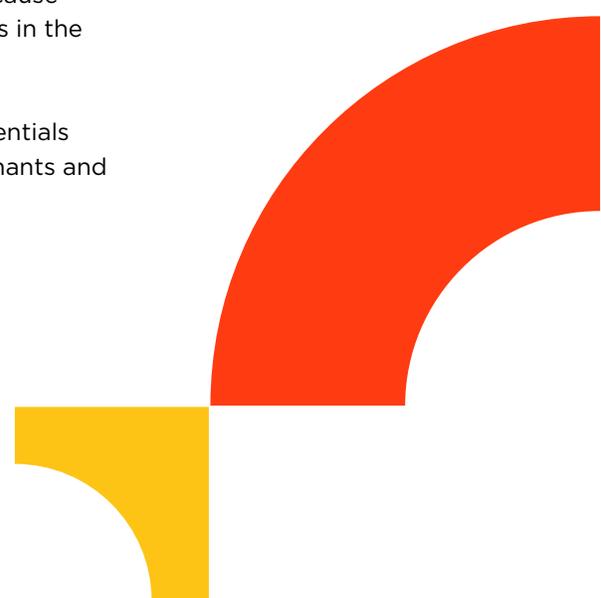
In a McKinsey survey of 340 executives, more than 90 percent said risk management—whether from consumers, regulators, or the market (for example, high resource prices)—is an important factor in pushing them toward sustainability initiatives.¹⁷

Sustainability has core business benefits that deliver a long-term ROI on the following attributes:

- Brand/reputation
- Client-focused solutions
- Risk management
- Growth strategy
- Talent recruitment and retention

Take Whirlpool, for example: It has improved appliance energy efficiency because it has watched energy efficiency move from number 12 in consumer priorities in the 1980s to number three, just behind cost and performance, today.¹⁸

In terms of design and architecture, buildings with better sustainability credentials enjoy increased marketability. Green buildings more easily attract buyers/tenants and earn higher rents and sale prices.



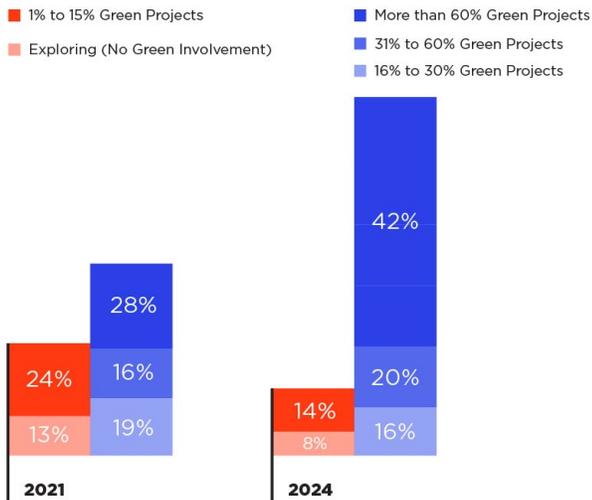
¹⁶ Hoffman, Andrew. “The Next Phase of Business Sustainability”, Stanford Social Innovation Review, Spring 2018. https://ssir.org/articles/entry/the_next_phase_of_business_sustainability#

¹⁷ Oppenheim, Jeremy; Stuchey, Martin. “Like it or not, sustainability is now core to your business”. FORTUNE, 24, Sept 2015. <https://fortune.com/2015/09/24/sustainability-practices-in-business-intel-unilever-wal-mart-dupont/>

¹⁸ Hoffman, Andrew. “Getting Ahead of the Curve: Corporate Strategies That Address Climate Change”, Oct 2006. <https://www.c2es.org/site/assets/uploads/2006/10/getting-ahead-curve-corporate-strategies-address-climate-change.pdf>

Level of Green Building Activity

(According to All Global Respondents)

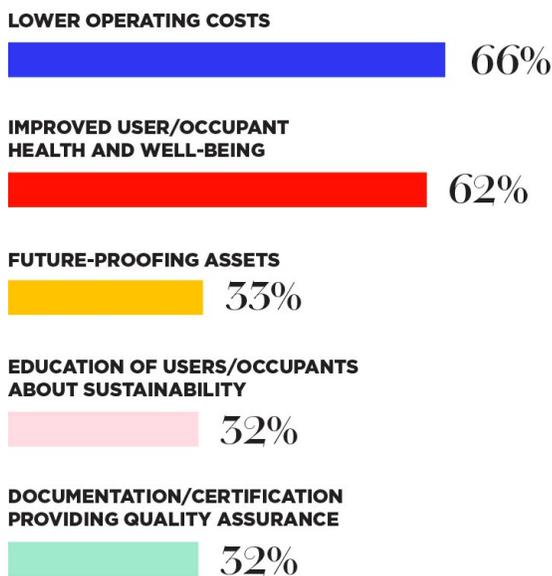


Dodge Data & Analytics, 2021

The 2021 World Green Building Trends Study demonstrates a commitment to increasing green building activity as have the previous studies in 2018, 2015 and 2012. As the chart on the upper right shows, there is a high level of growth expected in the next three years among those who anticipate doing more an 60% of their projects green, and a corresponding reduction in those who plan on engaging in fewer than 15% green projects.

These findings show that green building continues to remain a global priority, likely driven by increasing extreme weather events and despite other rising concerns like the global pandemic.

Most Important Business Benefits of Green Building

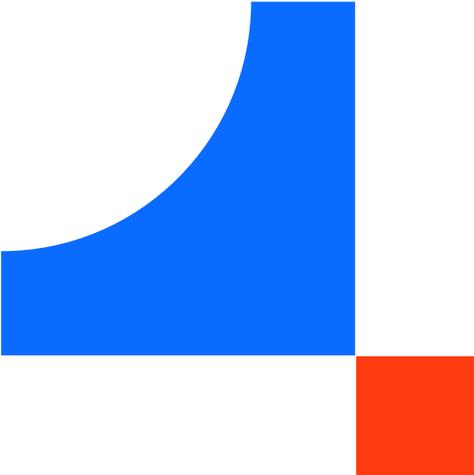
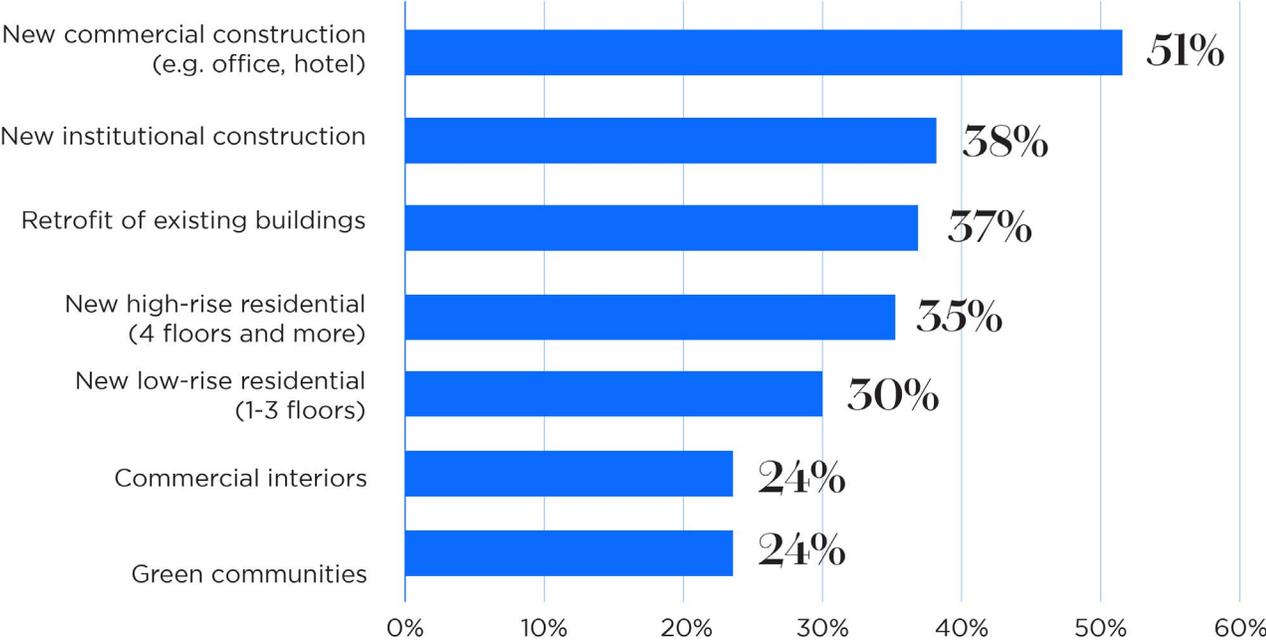


Business benefits such as decreased operating costs, short payback periods and asset value increases are strong drivers of green building. Creating healthier indoor environments is also growing as a major motivator.

Commercial construction is leading the way. New commercial construction such as office buildings and hotels are projected to have the largest share of green building activity over the next three years.¹⁹

Ultimately, integrating sustainable practices into your business can help foster growth in both the near and long term.

SHARE OF GREEN BUILDING ACTIVITY OVER NEXT THREE YEARS



Tools for making smart sustainable choices

There are several third party groups that have done the heavy lifting for us in terms of guidelines and best practices that we can leverage. Here are some of the key resources we recommend exploring.

BREEAM: Code for a Sustainable Built Environment

BREEAM is the world's leading sustainability assessment method for master planning projects, infrastructure and buildings. It recognizes and reflects the value in higher performing assets across the built environment lifecycle, from new construction to in-use and refurbishment.

BREEAM does this through third party certification of the assessment of an asset's environmental, social and economic sustainability performance, using standards developed by BRE. This means BREEAM rated developments are more sustainable environments that enhance the well-being of the people who live and work in them, help protect natural resources and make for more attractive property investments.

[Read more here](#)

The International WELL Building Institute (IWBI)

IWBI delivers the cutting-edge WELL Building Standard™, the leading global rating system and the first to be focused exclusively on the ways that buildings, and everything in them, can improve our comfort, drive better choices, and generally enhance, not compromise, our health and wellness.

WELL was developed by integrating scientific and medical research and literature on environmental health, behavioral factors, health outcomes and demographic risk factors that affect health with leading practices in building design, construction and management.

[Read more here](#)

LEED: Leadership in Energy & Environmental Design

[LEED certification](#), developed by the [U.S. Green Building Council](#), provides a framework for green building design, construction, operations and performance. Built-in strategies and related outcomes help buildings and spaces determine what is most important, set sustainability goals and then go on to achieve those goals. Nearly 100,000 projects are participating in LEED across 180+ countries and territories, comprising over 24 billion square feet.

[Read more here](#)

LET'S MAKE EVERY PROJECT GREEN - INSIDE AND OUT.



v4.1 is the newest version of LEED and improved thresholds in energy, water, waste and indoor environmental quality, a new credit category focused on location and transportation and a serious, increased focus on human health.

LEED v4.1 pushes forward a paradigm shift in how we think about materials.

ECONYL® regenerated nylon contributes to LEED v4.1 points in four main categories:

Integrative Process

LEED INTENT:

To support high-performance, cost-effective project outcomes through an early analysis of the interrelationships among systems.

How ECONYL® nylon contributes:

We share our knowledge and experience creating sustainable materials with project teams to collectively enhance human comfort and environmental benefits. This enables project teams to achieve project goals focused on quality and performance by securing targeted credits that ECONYL® yarns contribute to for LEED v4.1

Indoor Environmental Quality (2 Credits)

LEED Category Overview:

The Indoor Environmental Quality (EQ) category rewards decisions made by project teams about indoor air quality and thermal, visual, and acoustic comfort. Green buildings with good indoor environmental quality protect the health and comfort of building occupants.

The credits where ECONYL® nylon contributes:

- Low emitting materials: General Emissions Evaluation results ensure low VOC levels in ECONYL® products
- Construction indoor air quality management plan

Materials and Resources (4 Credits)

LEED Category Overview:

The Materials and Resources (MR) credit category focuses on minimizing the embodied energy and other impacts associated with the extraction, processing, transport, maintenance, and disposal of building materials.

The credits where ECONYL® nylon contributes:

- Building Life Cycle Impact Reduction
- Building Product Disclosure and Optimization - Environmental Product Declaration
- Building Product Disclosure and Optimization - Sourcing of Raw Materials
- Building Product Disclosure and Optimization - Material Ingredients

Innovation

LEED Category Overview:

Sustainable design strategies and measures are constantly evolving and improving. New technologies are continually introduced to the marketplace, and up-to-date scientific research influences building design strategies. The purpose of this LEED category is to recognize projects for innovative building features and sustainable building practices and strategies.

HOW ECONYL® nylon contributes:

- Advancement of the Circular Economy through nylon regeneration, going beyond recycling
- Eco-design

“We are proud to be part of the green building and design movement. Architects and designers have a growing consciousness that sustainability is mission critical to our future. We have created ECONYL® to help move green building and design forward. Contributing to LEED points is a very important motivator for our partners, and we are excited to contribute to LEED v4.1 points across four categories.”

— Giulio Bonazzi, Chairman and CEO of Aquafil SpA

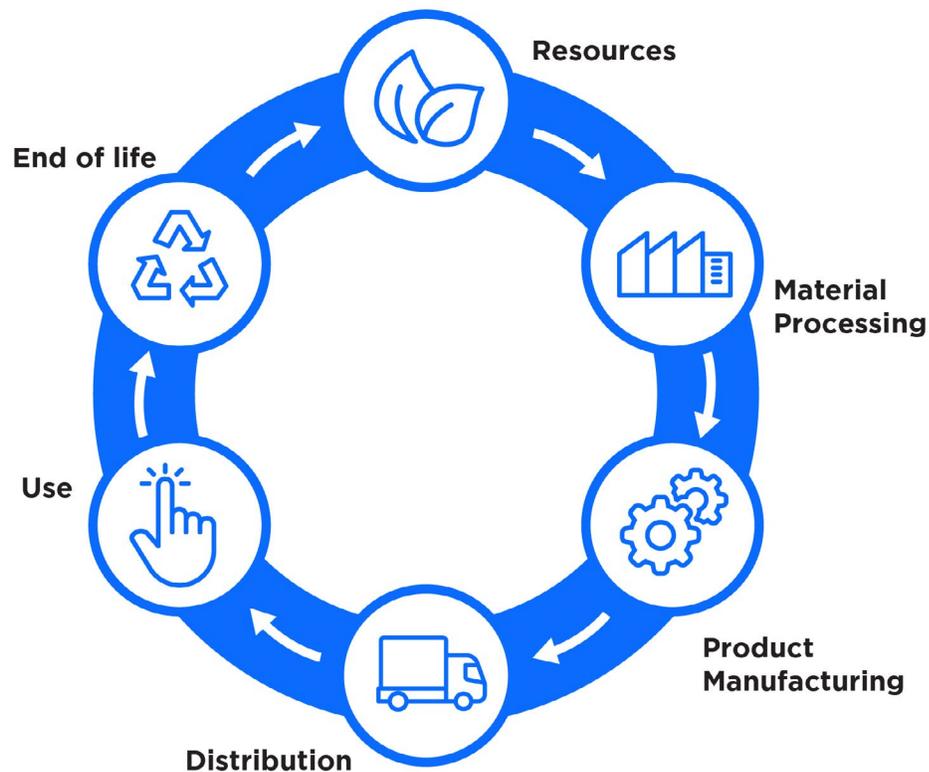
Life Cycle Assessment (LCA)

There are many sustainable materials, recycled content, and recyclable and reclaimed materials, and the supply will continue to grow. When evaluating sustainable materials, interior designers and architects can look at durability, toxicity and efficiency of the material from environmental view, recyclability, percentage of recycled content in the final product and also environmental properties of the ingredients.

The best approach is the Life Cycle Assessment (LCA), a standardized technique for assessing the potential environmental aspects generated by the product throughout its entire life cycle, from raw material acquisition to production, use and disposal.

The standards for Life Cycle Assessments are provided by the International Organization for Standardization (ISO) in ISO 14040 and 14044. There are four main phases of an LCA²⁰:

- Goal and scope – establish the context in which the assessment is to be made and identify the boundaries and environmental effects to be reviewed for the assessment.
- Inventory analysis - Identify and quantify energy, water and materials usage and environmental releases
- Impact assessment - assess the potential human and ecological effects of energy, water, and material usage and the environmental releases identified in the inventory analysis
- Interpretation - Evaluate the results of the inventory analysis and impact assessment to select the preferred product, process or service with a clear understanding of the uncertainty and the assumptions used to generate the results



Conclusion:

The power of designing with the end in mind

As was noted earlier in this paper, designers and architects can impact up to 90 percent of a project's eventual impact based on the earliest design decisions. Innovation in technology, materials development, design and building methods and sciences such as biomimicry make it an exciting time to be a creator across industries.

It is a particularly intriguing, exciting and challenging time to be part of the architecture and design industry as we work to move our clients and projects toward becoming truly sustainable.

According to the Global Commission on the Economy and Climate, transitioning to a low-carbon, sustainable growth path could deliver a direct economic gain of US\$26 trillion through to 2030 compared to business-as-usual.

We have an opportunity to redesign the world around us to be less wasteful and more regenerative.

“The growth story of the 21st century will unlock unprecedented opportunities and deliver a strong, sustainable, inclusive global economy. The benefits of climate action are greater than ever before, while the costs of inaction continue to mount. It is time for a decisive shift to a new climate economy.”

—The Global Commission on the Economy and Climate

Designing with the end in mind is focusing on the total lifecycle of a project. An important part of this philosophy is not only having a clear vision, but also the impact it will have when eventually it needs to be updated or demolished. It also means looking at the inside of the building and its design. What materials are

being used? How are they made? What is their carbon footprint? And more important, how will we recycle them? Design can have a positive impact if it's done “with the end in mind.”

This is a point that Giulio Bonazzi, chairman and CEO of Aquafil, likes to highlight as much as possible because it's key to produce products today that we will be able to recycle more easily in the future. Bonazzi has revolutionized the way his company works and today it is the only company in the world that produces nylon that is 100 percent regenerated from waste called ECONYL® that is used in carpeting and fashion all over the world.

The power of architecture and design to influence our environment is great.

We must move beyond only creating beautiful built-environments. We must challenge ourselves and our clients to build structures that last and add harmony to our lives and the ecosystem and that are easier to recycle.

We hope you will join us on this important journey to build a healthier, more sustainable future for generations to come.

RE-ENGINEERING CARPET WITH ECODESIGN

Aquafil is a company focused on creating materials and processes that move us toward a circular economy. With the creation of ECONYL® regenerated nylon, we have committed to finding innovative solutions to tackle the carpet waste challenge.

The Environmental Protection Agency estimates every year about 4 billion pounds of carpeting goes into landfills. Carpets comprise 60 percent share of the U.S. flooring market, with 11 billion square feet or over three billion square meters sold per year, yet only five percent of carpet waste is recycled.

It can take hundreds of years for carpet to degrade in a landfill. To address this issue, recycling is our best option for reducing carpet waste.

The time to act is now. If we wait, we could be stuck in the linear economy for another decade, forcing future generations to deal with trillions of pounds of carpet waste that was not designed to be recyclable.

A Fork In the Road

We can ecodesign new carpets that either are made using a mono-material that is recyclable an infinite number of times without loss of quality, or have different components that can easily be separated for recycling.

Carpets are performance-based products like athletic shoes designed and manufactured for durability and style. They come in many different shapes and sizes, using a myriad of materials that are challenging to separate and recycle. The backing of carpets are like the soles of a sneaker – critical to performance but challenging to separate from the top part of the shoe for recycling.

But what if we could have a high-performance carpet flooring that was ecodesigned to be recycled at the end of its use? We believe we can.

In fact, the European Carpet and Rug Association has already begun to map out a blueprint for this including:

- Combining polymers that are easy to separate
- Avoiding use of additives that aggravate the recycling process

Leading-edge carpet manufacturers including Tarkett are on this path, too. Tarkett has developed breakthrough technology at its Waalwijk facility and is now able to separate the two principal components of carpet tiles – yarn and backing, while retaining more than 95% yarn purity.



DESSO Desert AirMaster® Carpet

This level of purity is vital in ensuring that the polyamide 6 (PA6) yarn can be recycled by Aquafil and later transformed into regenerated ECONYL® nylon yarn.

In addition, Tarkett has increased its capacity in Waalwijk to produce its EcoBase carpet tile backing to meet customers' growing demand for this sustainable product. EcoBase has been designed for disassembly from the outset.

Overall, 100% of an EcoBase-backed carpet tile with PA6 yarn is recyclable. The PA6 yarn and backing are recycled without loss of quality; used yarn becomes new yarn and used backing new backing. Recycling EcoBase-backed carpet tiles with ECONYL® yarn delivers up to 84% CO2 savings compared to incineration.

EcoBase is 100% recyclable and Cradle to Cradle Gold-certified™. It has also achieved Cradle to Cradle® Platinum level for material health.

We all deserve to live in environments and use products that aren't made of hazardous materials. We all deserve to have the choice to use materials that don't cause harm to our planet and our future.

Collaborating with motivated partners like Tarkett, we will continue to find innovative ways to make carpet recyclable through ecodesign.

About Aquafil & The ECONYL® Brand

Aquafil is a pioneer in the circular economy also thanks to the ECONYL® regeneration system, an innovative and sustainable process able to create new products from waste and give life to an endless cycle. The nylon waste is collected in locations all over the world and includes industrial waste but also products – such as fishing nets and rugs – that have reached the end of their useful life. Such waste is processed to obtain a raw material – caprolactam – with the same chemical and performance characteristics as those from fossil sources. The polymers produced from ECONYL® caprolactam are distributed to the Group's production plants, where they are transformed into yarn for rugs, carpet flooring, and for clothing. Founded in 1965, Aquafil is one of the main producers of nylon in Italy and worldwide. The Group is present in seven countries and in three different continents, with over 2,800 employees at 19 production sites located in Italy, Slovenia, United States, China, Croatia, Scotland, Thailand and Japan.

Aquafil Group, headquartered in Trento, Italy is working with more than 2,000 leading design and fashion brands worldwide to make our global economy more circular. The Group's facilities run on 100 percent energy from renewable resources and as a whole the Group has reduced its greenhouse gas emissions by 56% compared to 2016.

Each year in the U.S., four billion pounds of carpet is discarded in landfills. Carpets comprise 60 percent share of the U.S. flooring market, with 11 billion square feet or over three billion square meters sold per year, yet only five percent of carpet waste is recycled.

Aquafil finds other resourceful ways to recover nylon waste by engaging in various global environmental and social programs, such as Net-works™, Healthy Seas Initiative. Through this, Aquafil spreads awareness of ocean conservation issues and protects marine life through the recovery of abandoned fishing nets, which are responsible for millions of deaths of marine animals each year.

Aquafil is the only company in the world that produces 100 percent regenerated nylon from waste, called ECONYL®. The Group rescues waste from a number of sources around the world including fishing nets, carpets, fabric scraps and industrial plastic.

For every 10,000 tons of ECONYL® raw material, 70,000 barrels of crude oil are saved, and 65,100 tons of Co2 equivalent emissions are avoided.

ECONYL® nylon performs exactly the same as brand new nylon and it can be recycled, recreated and remolded again and again.

ECONYL[®] Case Studies

MASLAND CONTRACT STAYS TRUE TO ITS SUSTAINABLE DESIGN FOCUS WITH A NEW COLLECTION USING ECONYL[®]

The Crafted Collection celebrates skillful artistry and innovative materials with an intentional focus on creating products that work together in a holistic approach. Abstract patterns, versatile colors and captivating textures set a creative foundation to the space while blending the incredible benefits of ECONYL[®] regenerated nylon and Sustaina™, a non-PVC, non-polyurethane backing system.

As a result, this contemporary carpet tile collection delivers a complete solution that redefines the interior experience with a one-of-a-kind sustainable application. It's carpet tile that you can feel good about specifying.



MOVE™ CHAIR MADE BY NOHO.CO, DESIGNED FOR PEOPLE AND THE PLANET

noho.co is a digital native furniture brand based in Boulder, Colorado, but born and made in Aotearoa New Zealand. noho is a company with deep roots in, and a deep respect for, the natural beauty and cultural values of its New Zealand home. In New Zealand's indigenous Te Reo Maori, noho means 'to sit, stay, dwell, live'. This D2C brand is on a mission to transform the well-being of both people and planet through dynamically comfortable furniture manufactured from up-cycled waste and sustainable materials, like ECONYL® nylon.

The noho move™ chair was created to transform the traditional static nature of home furniture by integrating the dynamic ergonomic comfort of a premium office chair and sustainable design, to create a chair that flexes and flows with any body and can last a lifetime.



noho manufactures all of their furniture in New Zealand to ensure sustainability and transparency throughout their supply chain while powering production with more than 80 percent renewable energy. noho is the first furniture brand in the world to use ECONYL® regenerated nylon for a chair.

ROLLS-ROYCE'S DATA EXPERTS OFFICE IN DERBY GETS A SUSTAINABLE MAKEOVER

Modular flooring manufacturer Interface partnered with the design company Source8 to redesign Rolls-Royce's Data Experts Office in Derby.

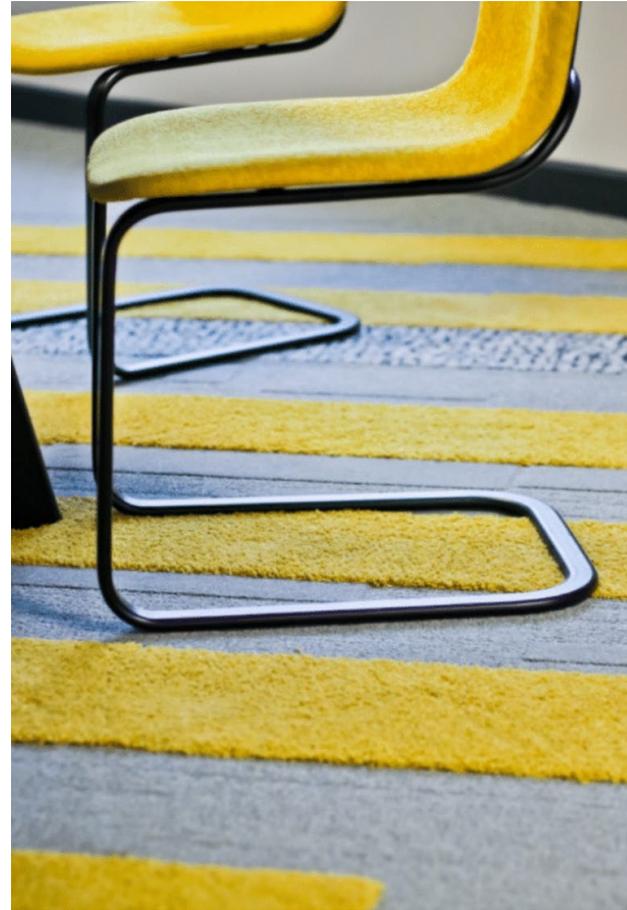
The challenge was to transform the 1,700m² Data Experts Office, which covers one floor, into a multifunctional hub of creativity and productivity, creating a balance between the company's heritage – Rolls-Royce was established over 100 years ago – and its role as a global innovator. The company has a long-standing commitment to reduce the environmental impact of its products, services and manufacturing activities.

Rolls-Royce needed a multipurpose space with meeting rooms, breakout areas, quiet zones and a wellness room that encouraged social interactivity with the other business groups occupying the floor and wanted to incorporate an urban and industrial feel using textures, patterns, and color.

To meet the company needs, the team blended carpet tiles coming from three different collections by Interface. Interface uses ECONYL[®] yarn, 100% regenerated nylon coming from pre and post-consumer nylon waste such as fishing nets, textile scraps, and old carpets.

Lauren Marshall, Interior Designer at Source8, said: "Interface listened to the brief and presented a design that did not disappoint. The concept design team's blended approach and use of a variety of designs and textures, particularly from the Human Nature range, meant there wasn't a straight line in sight. The biggest challenge was convincing everyone that floor coverings don't have to be a block of color or follow a structure. Interface added huge value to the project. All parties involved from Rolls-Royce to the carpet installers are more than pleased with the final result."

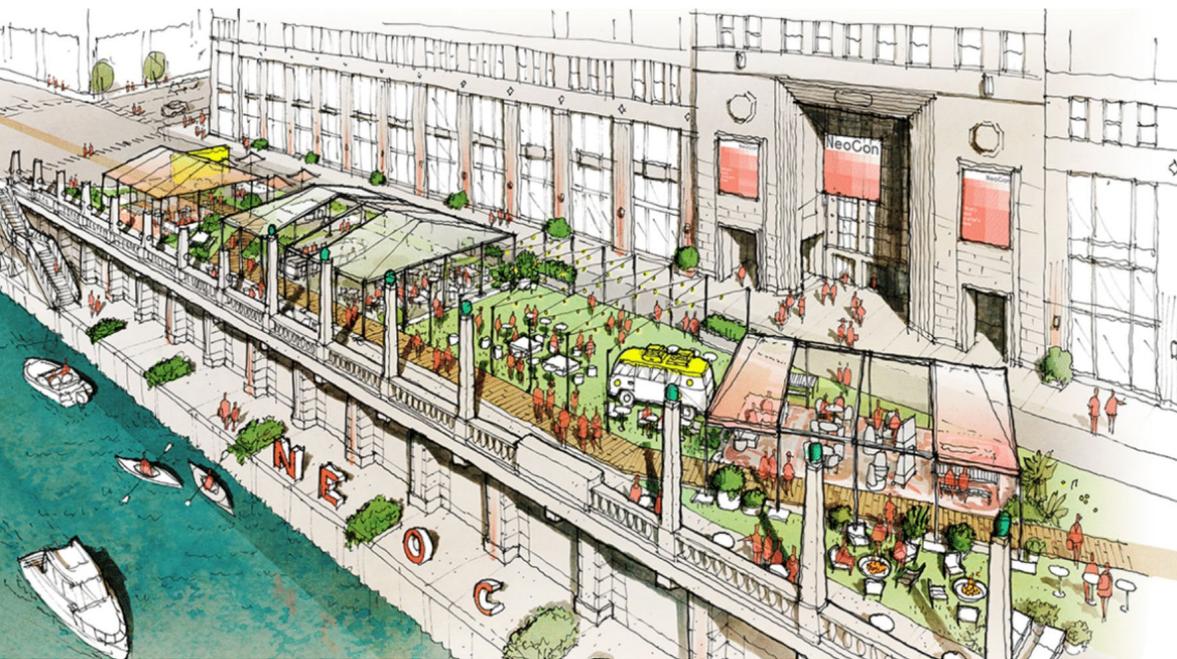
[Read more here](#)



ECONYL® CARPETS FEATURED ON THE NEOCON URBAN BOARDWALK

We believe part of the sustainable revolution is also in the way we create and design spaces and how we mix the outside with the inside to improve our lives through design. In 2019, we partnered with NeoCon for the first edition of the NeoCon Plaza with the intention to use diverse spaces to inspire trade show attendees.

This was an “Urban Boardwalk” outside the Mart in Chicago that was designed by Gensler studio and brought to life by Forward Fruit Branded Environments. Four tents had beautiful broadloom carpets made with ECONYL® yarns and designed by Charlotte Croy Hudson, which have been either reused or recycled at Aquafil's recycling plant. The patio area was also decorated with a stunning mix of tiles by Interface also made with ECONYL® yarn. This space was meant to connect, work, unwind, recharge and enjoy the outdoors throughout each day and evening and it sure served its purpose.



Rendering of the NeoCon Plaza - © Gensler - Michael Townsend (artist, design director, Gensler Chicago)

OCEAN NETWORKS COLLECTION BY ALCAROL

alcarol is an experimental design studio based in Italy that creates innovative furnishings inspired by the environment that are produced using avant-garde techniques.

The tabletops shown below are designed by alcarol for the Ocean Networks Collection using reclaimed fishnets from the ocean in various colors melted together with ECONYL® polymers creating a marbled effect.

The legs of the tables are made of glass slabs and aluminum fixings - two of the best examples of recyclable materials in the world - simply wedged and screwed in the nylon tabletops, so each part can be easily removed in order to make the prototypes 100% recyclable in the future.

Through the transparency and reflections of the glass at different heights, the colored fishing nets of the tabletops seem to float, as an abstract reflection about the fragile condition of our oceans.

alcarol is based in Belluno, Italy. Their pieces are featured in showrooms and can also be found in various galleries and shops all over the world.

[Read more here](#)



TARKETT DESIGNS A FULLY RECYCLABLE CARPET FROM CRADLE-TO-GRAVE

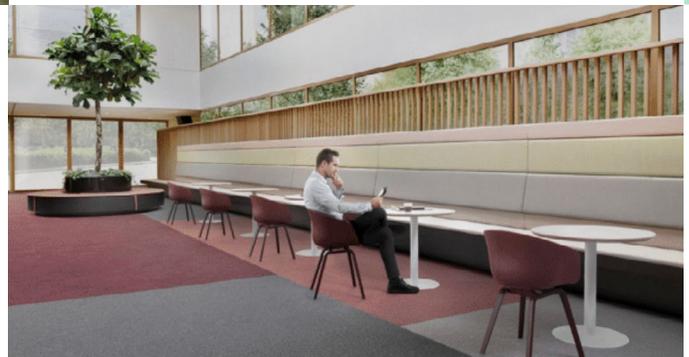


Desso is a Dutch carpet manufacturer who decided to re-engineer carpet tiles to make them more easily recyclable at the end of their life. It's called engineering for remanufacturing or for disassembly, and we like this concept because our ECONYL® yarn is regenerated and infinitely regenerable, so we are always looking to collaborate with brands willing to re-engineer their products in a way that makes the recovery of the fiber easier and more sustainable and keeps materials in the production cycle. The name of the collection is Desso Air Master® with recycled EcoBase® backing, and all products in this range are certified Cradle to Cradle® Silver. The upper part is ECONYL® yarn while the EcoBase® backing, which is 100% recyclable, contains recycled, re-engineered calcium carbonate (chalk) from local drinking water companies. The two parts are designed in a way that makes it very easy to separate for recycling.

Indoor Air Quality

Tarkett is on the front line of studies and development in this area: Clean indoor air is vital to human health. However, indoor quality is comprised by a number of factors, the most serious of which is fine dust, or particulate matter which is associated with a range of health issues, both respiratory and cardiovascular, and can also trigger or aggravate allergies. Tarkett's DESSO AirMaster® carpet has been designed to capture and retain particulate matter, helping to improve indoor air quality for employees.

The design of today's workspaces should have a positive impact on productivity, creativity and the environment. These innovative carpet flooring options not only inspire, but are sustainable as well.



Improved Light

Light-reflecting flooring solutions can make a substantial difference to the amount of light reflected within a room, particularly given that floors cover large surfaces. Installing DESSO Light Reflection Master can increase brightness on the walls and ceilings by up to 14%. As a result, lighting costs can be reduced by up to 10%, helping to reduce CO2 emissions, while increasing employees' exposure to natural light.

**EGE DESIGNS BEAUTIFUL,
HIGH-PERFORMING
CRADLE-TO-CRADLE
CERTIFIED CARPET
USING ECONYL®**



The new Rawline Scala carpet collection by ege combines the rawness of the flat woven look and feel with all of the acoustical and practical advantages, making the carpet material superior to any interior design.

It comprises three design themes, Minimal, Reflex and Heritage, each celebrating the eternal textures favored by fashion and different cultures in all times. The references to the textiles' textures and weaving structures are evident in the design expressions embracing three pattern scales from small, medium and large.

Rawline Scala is produced from regenerated and regenerable ECONYL® yarns partly consisting of used fishing nets that are collected, cleaned and reborn as strong carpet yarns. All carpet tiles come with ege's patented and Cradle to Cradle Certified™ Ecotrust backing created through an innovative technique transforming water bottles to a soft yet strong PET felt with superior acoustic performance.

Innovative Carpet Producers Using ECONYL® Yarns

HOW CAN YOU FEATURE ECONYL® REGENERATED NYLON IN YOUR NEXT PROJECT?

You can choose among a variety of collections from innovative carpet producers that use ECONYL® yarns:

A. Helmbold	Milliken
Anker	Modulyss
Associated Weavers	Mooiflor
Autoneum	Moquetas Rols
Balsan	National Floorcoverings
Balta	Object Carpet
Beaulieu	Paragon Carpet Tiles
Betap	Pottery Barn Teens
Bic	Radici
Burmatex LTD	Rinos
Cavalier Bremworth	Suminoe
Condor	Tapibel
Danfloor	Tarkett
Delos	Tecsom
EC Australia Group	Tisca
Ege	Toucan-T
Filo Rosso Industria Textil	Vebe Floor Coverings
Forbo Flooring Coral	Venture Carpets
Forbo Flooring UK	Verimpex Group
Gradus	The Victoria Carpet Company
Halbmond Teppichwerke	Vorwerk
Ideal Automotive	VoxFloor
Interface	Wuxifuxing carpet
Interfloor	Yamamoto
Japan Carpet	Zeno-Protect
Mannington Commercial	Zhejiang Dongfang Xingyue
Masland	



David Oakey
The NetEffect™ Collection by Interface

[This list of carpet producers that use ECONYL® yarns is updated online here for ease of reference.](#)



ECONYL[®]
ENDLESS POSSIBILITIES

