BLUEBEAM
A NEMETSCHEK COMPANY

# Building a Sustainable Future

Save money, save time and create a greener industry by adopting new technologies and reducing waste.

# Why does sustainability matter?

## Construction is one of the least sustainable industries in the world. And it's costing us.

We use up to 40% of the world's energy, according to the US Green Building Council (USGBC), And by 2030, emissions from commercial buildings could grow by another 1.8%.

By building sustainably, we can drive down energy consumption and save money in the process.

Sustainable buildings require less maintenance and offer better ROI. In fact, the global economy could save US$455 billion in energy use per year by simply using sustainable technologies.

There's also the issue of waste. Waste management is a timely, expensive process that can eat into a project's budget. In the UK, an average three-bed unit produces between 5 and 13 tons of construction waste.

Reducing waste with sustainable materials could save a company £250-500 per unit.

This is a global issue. The United Nations set up 17 Sustainable Development Goals to protect the planet and end poverty by 2030. It includes goals to invest in infrastructure and innovation: promoting sustainable industries and supporting sustainable development.

By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.

The goals are ambitious, but we can make them happen. We create buildings and cities to last lifetimes. Let's make them sustainable for the future.

# Where can we be more sustainable?

With a fast-growing population, increasing demand for comfort and more people spending more time inside, demand for construction won't slow down any time soon.

That's good news for our industry, but if we want to keep our construction costs down, we need to look at sustainable building.

## #1 Going green

A green building costs less in the long term because it saves on energy use and reduces our carbon footprint.

These buildings are in high demand: people are realising there's a significant ROI in sustainable buildings, and demand is only set to grow by 2021.

In the United States, green buildings consume 25% less energy and 11% less water than other buildings.

Other green building benefits include:

- On average, green buildings save 8% in operating costs in the first year
- New green buildings have an increased asset value of 10%
- Through tax breaks, subsidies and other incentives, governments are encouraging companies to choose green builds

## #2 Working with waste

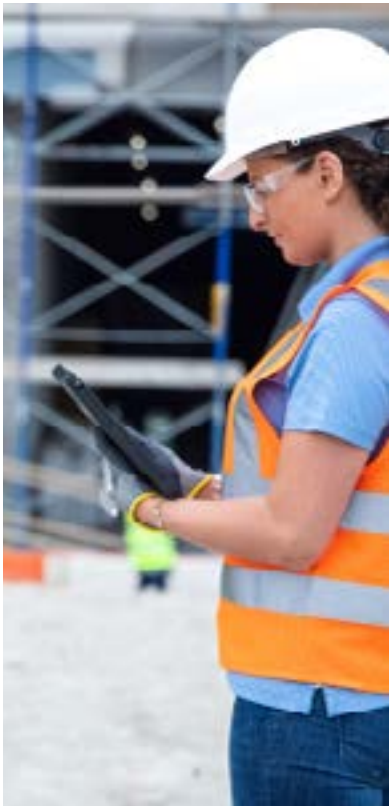
Waste is a major issue in construction. The more waste from a project, the bigger the hit to profit margins.

As an industry, our waste stats are alarming:

- Without ever being used, 13% of building site materials go directly to landfill
- Waste produced from construction sites will double to a total of 2.2 billion tons by 2025
- On average, companies spend as much as US$27,000 a year on printing as little as 5,000 sheets of paper
- Paper is a wasted resource – 50% of all pages printed are never even looked at

Poor quality building material results in more construction work down the line, and even more detrimental waste levels.

Sustainable materials last longer, and with proper waste management plans, you could reuse and profit off any leftovers.



## #3 Driving for digital

Construction is one of the least digitised sectors in the world: third last in Australia, second in the US, and last in Europe. Which stunts innovative ideas and technologies that could make us more efficient.

New technologies make life more efficient. They offer smart building systems to monitor, reduce and keep track of overall emissions. And it gives future occupiers and owners more control over their energy consumption – which would save money overall.

A full digital roll-out would mean:

- Communication and collaboration with virtual technologies: taking the industry paperless
- Solar-powered energy
- Zero-energy building practices
- Sustainable indoor technologies
- Water-saving technologies

# What is sustainable construction like around the world?

## UK & Europe



- Currently, 27% of all UK projects are green buildings
- By 2040, this should grow to 40%
- Every year, construction and demolition work contributes up to 25% of solid waste produced in Europe
- The European energy efficiency-related construction market is expected to double to €140 billion by 2020

## APAC



- 63% of Australia's buildings are green – making it a global leader in sustainable construction
- The market for global green building materials in Australia is expected reach $377 billion by 2022
- Construction and demolition work contributed up to 23% of solid waste produced in Hong Kong, 59% of waste in Singapore, and 80% of waste in the UAE

## USA & Canada



- The US construction industry accounts for 25% (160 million tons) of non-industrial waste generation a year
- The US Green building market is worth over US$81 billion
- A third of Canadian construction companies work on green projects
- Canada's green building industry is booming – from 2004 to 2014, they generated CA$23.45 billion and created 297,890 full-time jobs

## Latin America



- In Latin America, buildings use 21% of treated water and 42% of electricity, while producing 25% of $CO^2$ emissions and 65% of waste
- By switching to green building, the sector could reduce energy use by up to 50%, and solid waste by 70%

# Three steps to sustainability

There is good news:
sustainable solutions can help improve overall standards, save time and increase efficiency.

Here are three ways we can make a difference:

#1 **Digital integration**
Adopt new technologies and practices to help reach sustainable solutions.

#2 **Sustainable construction materials**
Use construction materials with a greater lifespan and less of an environmental impact

#3 **Build with social impact in mind**
Consider each project's long-term social impact

# Digital integration: the tech solution

By reimagining the way building data is accessed, processed and distributed, we can manage construction's environmental waste.

**PRECONSTRUCTION**

Data-focused design is changing construction for the better. It helps teams plan ahead, spot future problems and test ideas long before projects begin. This means less waste, and more efficient building processes.

**CONSTRUCTION**

Tech solutions improve communication between the office and field. With digitally marked-up drawings, you get a clear picture of measurements – reducing excess waste. With everyone working on the same drawings and documents, you save on paper too.

It's starting to take off. Turner Construction, one of the largest construction companies in the US, wasted over 1,000 hours a day dealing with paper – costing close to US$70,000. By turning to Bluebeam and digital solutions, they've saved over US$15,000 worth of paper per year and saved time in the process.

**POST-CONSTRUCTION**

Once a project is finished, digital operation and management manuals can be easily pulled together, updated when needed and last as long as you need them to. That saves time for handovers and avoids delays.

By installing smart building tech, building managers can make changes to improve a building's efficiency, monitor the health of the building, and avoid delays, which can cost up to 20% of the project's budget.

# What are the results

## Reduced emissions

Every member of a digitally focused project can have an input in the design stages, without ever having to commute between meetings and building sites. It saves on fuel, transport and energy costs.

## Reduced paper usage

Paper and printing costs can eat up a project's budget. With environmentally sound digital processes, companies like Plumco cut their paper use by 92% – saving them thousands each year.

## Faster completion of projects

The longer a build goes on, the more of an impact it has on the planet.

With digital tools, you'll never have to wait for a rainy day. With AI, you can evaluate a building in any weather condition.

It only takes a few clicks to get the information you need, saving the environment from an otherwise lengthy process.

## ARPRO Goes Digital

ARPRO, a mid-size Colombian architecture and construction company, needed a standardised digital document management system to handle its biggest project ever, Atrio.

ARPRO was still managing documents by printing them – each version needed to be signed by a representative and delivered by hand to stakeholders.

**Energy Efficient**

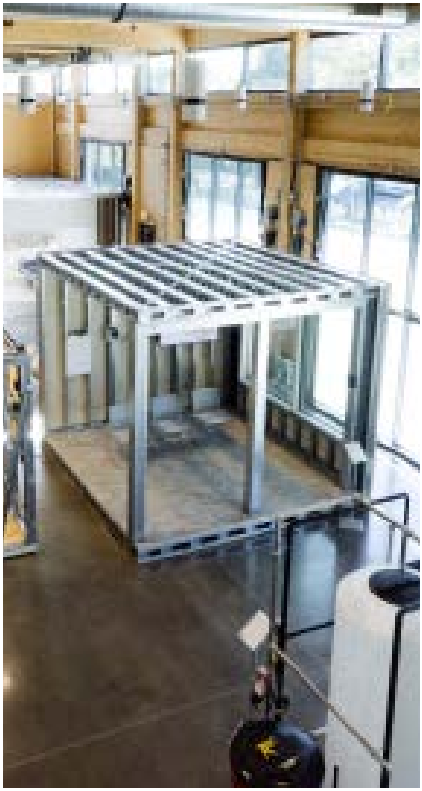
ARPRO cut its construction time in half by synching documents online in real-time. Now, it uses this process on all its projects, saving on resources and shifting the culture from paper to digital for 300 employees.

With a reduction in paper and transport costs, ARPRO reduced its carbon footprint.

*Read the full case study here*

# Sustainable construction materials: reducing our waste

Materials from buildings last a long time. Up to 32% of UK landfill waste comes from the construction and demolition buildings.



### PRE-CONSTRUCTION

By choosing more sustainable tools ahead of construction, companies can plan projects accordingly.

For example, concrete, when altered by a new kind of technology, creates porous concrete: a material that absorbs pollutants from vehicles and prevents flood risks. And Skanska's Green Concrete: a low-carbon concrete, halves carbon emissions by replacing parts of the cement volume with slag.

### CONSTRUCTION

Properly designed materials have a significant impact on a project. With durable recyclable composites, overall waste outputs greatly decrease. In the US alone, sustainable buildings have kept 80 million tons of waste out of landfills.

At the University of Maine, Dr Habib Dagher's Advanced Structures and Composites lab is creating new material technologies, including a new generation of bio-based composite materials.

Read more about their groundbreaking work.

### POST-CONSTRUCTION

Better materials, better results. Over time, using materials with lower energy costs increases the lifetime value of a building and can reduce overall energy costs. On average, there's a 20% drop in maintenance costs in energy efficient buildings. And increased occupancy rates of 17%.

# What are the results

## Less waste to landfill

The true cost of landfill waste is often around 10 times the skip hire cost. And with landfill taxes in the UK set to increase, waste is a big hindrance on a project's budget.

With eco-friendly materials, building sites can cut waste production in half. Instead of going to a landfill, teams can recycle materials for future use. More money, less waste.

## Better in the long run

Materials developed with new technologies create a trend of long-term, durable buildings – with lower maintenance costs.

## Stronger than steel, cheaper than kevlar

Lumber is a sustainable, cheap resource because it can be easily 'grown'. That's why scientists at the University of Maryland are creating a high density 'super wood' with the help of nanotechnologies.

The result? A piece of lumber with higher tensile strength than most metals. It's far lighter – but strong enough to stop a bullet as well as Kevlar.

**What are the benefits?**

The wood is also super reflective: bouncing back 100% of light, and only absorbing a tiny bit of radiation. That means a cooler material, even in direct sunlight.

The team calculates that the super wood could result in energy savings between 20% and 60% in hot climates. Perfect for places with high air conditioning costs.

*Read the full case study here*

# Build with social impact in mind

If our industry wants to make a difference, we need to think about the long-term effects of a project.

**PRE-CONSTRUCTION**

From design to maintenance, teams have to work together to focus on a project's environment. We can't infringe on the area around it. It's important to stick to local rules and create environmentally friendly designs.

**CONSTRUCTION**

Construction sites can last months – even years. Noise pollution and waste pollution cause issues for the surrounding area. Projects should have a low impact on the community. Ideally, through shortened construction times.

**POST-CONSTRUCTION**

Construction employs over 10 million people alone in the US. For every new build, construction firms need to offer long-term benefits, like job opportunities, for the local community.

## What are the results?

### Sustainable developments

When a team values the input of local populations, they're more likely to have the community's support.

That's why you build with the area in mind: projects run smoother, and new you create new communities. Every development should aim to be socially sustainable.

## Nine ways to make your build more socially sustainable

1. Secure a building site/land legally, remaining sensitive to local culture
2. Engage with the community for the entire process
3. Design with cultural sensitivity
4. Design within the bounds of the local water supply
5. Use sustainable energy systems
6. Design in line with local codes and national and international standards
7. Help train and/or hire local population
8. Build using locally acceptable construction methods
9. Build with locally sustainable materials

# A look to the future

While the future looks bright for construction, it's never been more important for our industry to be sustainable.

We can save millions by reducing paper, digitising processes and minimising waste. It can be difficult to improve profit margins in construction – but reducing waste and eliminating paper are two starting points.

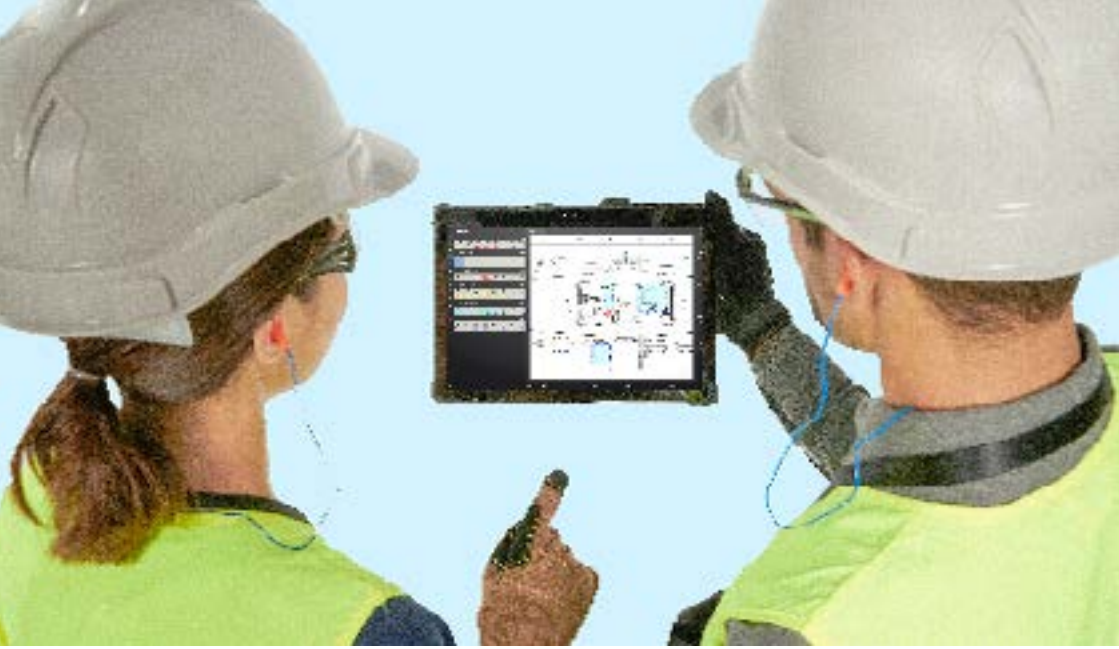
With sustainable materials, initial construction costs can be costly. But the ROI for sustainable buildings is obvious. And, as we continue to shift toward this green trend, it's important to adapt to the industry's future.

By 2050, 70% of the world's population will live in cities. This makes it even more important for project teams to consider the effects of builds – both locally and globally. With the right tools, technology and materials, we can make our industry more sustainable.

### Net Zero by 2030

The World Green Building Council is challenging companies, cities, states and regions to reach Net Zero operating emissions by 2030.

The hope is that by 2050, all buildings, globally will have 'net zero' emissions.



# Get started with Revu

## Make your next project sustainable – the first step is to go digital.

Try Bluebeam Revu: a markup and collaboration tool designed by industry people, for industry people.

Revu helps companies increase their overall efficiency and save money in the process.

- Plumco cut paper use by 92%, helping their customers receive quotes 75% faster
- ARPRO saved $30,000 per year on printing costs and improved their construction time by 40%

**Get started with Revu today.**



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