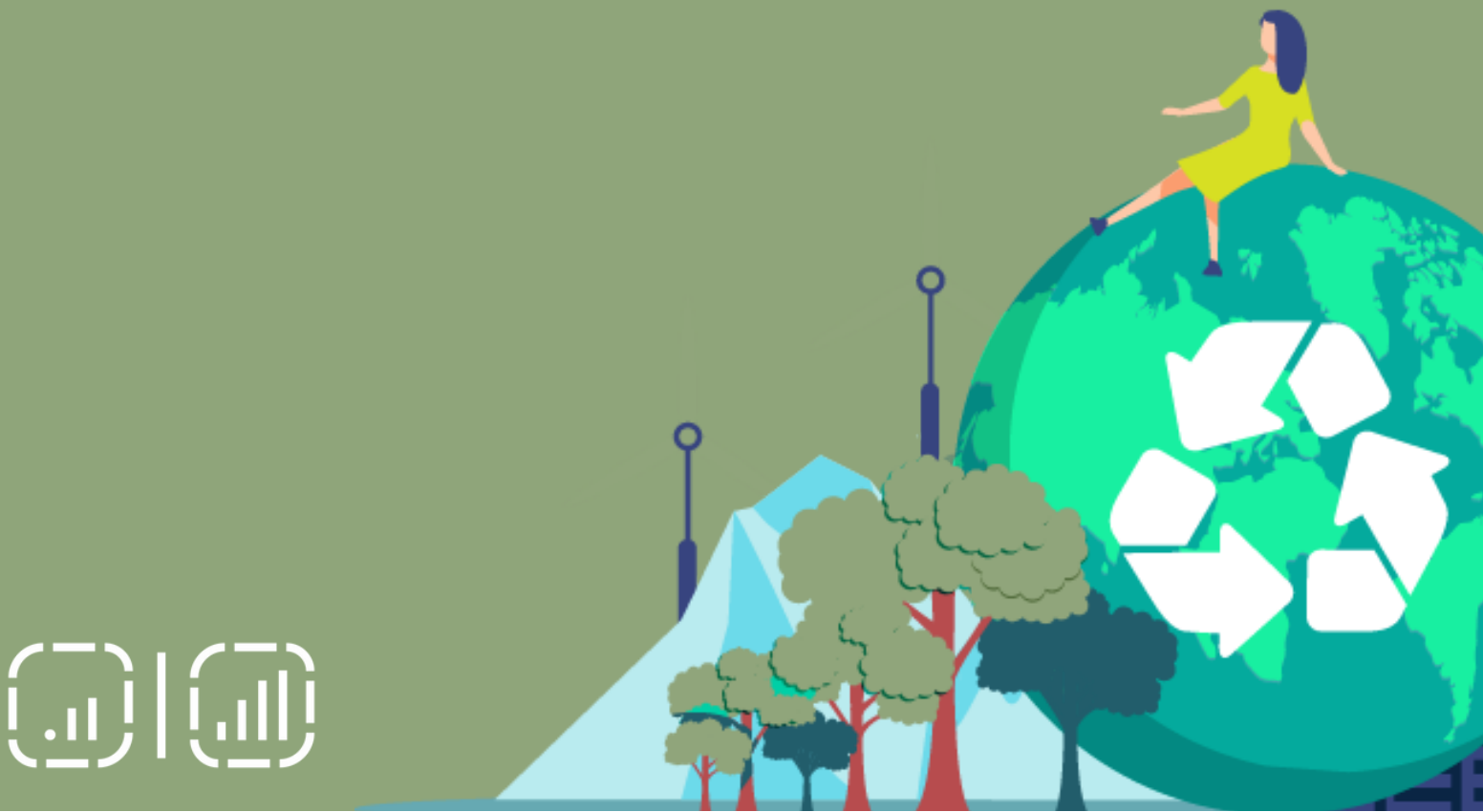


The PropTech Guide to ESG





Note from our COO, Michael Grant

It's no secret that ESG has grown exponentially in recent times. The value of ESG-driven assets has almost doubled over four years, and more than tripled over eight years, hitting \$45 trillion in 2020.

When I first started working at Metrikus, people were beginning to talk about ESG more and more. Now, it's a term that comes up almost every day in conversations with partners and clients. Sustainability as a whole has become a very hot topic, and I don't see this changing anytime soon.

There are two main reasons we've decided to put this guide together.

Firstly, for a topic that is spoken about so much there is a surprising lack of understanding when it comes to the key principles of ESG. We wanted to produce something that anyone could read to get a basic overview of all the need-to-know information.

Secondly, we wanted to highlight how PropTech and IoT can help with ESG. We get a lot of people asking us about this, and as far as I'm aware, there's really not a lot of information out there. Smart technology has a hugely important role to play in ESG, and we wanted to show that in a clear and accessible way.

If you have any questions about this guide or about ESG in general, please feel free to get in touch with me or the Metrikus team: our contact details are at the end.

Thank you,

Michael Grant

A handwritten signature in black ink, appearing to read 'Michael Grant'.

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The origins of responsible investing and the rise of ESG

The 18th century

The concept of responsible investing dates back as far as investing itself. In the 18th century, religious groups like Quakers and Methodists laid out clear guidelines to their followers about the types of companies they should invest in.

At an annual Quakers meeting in Philadelphia in 1750, members were explicitly warned against participating in the buying and selling of slaves. By 1758, engaging in slave trading was seen as an act of misconduct.

The 1960s

Responsible investing became slightly more formal in the 1960s. Investors started to exclude stocks or entire industries from their portfolios based on business activities. The key questions surrounding responsible investing reflected the social issues of the time, including the rise of the civil rights movement.

As the fund management industry grew, activists started to realise the huge opportunity shareholders had to influence corporate behaviour. In the US, the International Brotherhood of Electrical Workers invested their capital in developing affordable housing projects, while the United Mine Workers invested in health facilities.

The 1970s

In the 1970s, the worldwide abhorrence of the apartheid regime in South Africa led to arguably the greatest example of selective disinvestment. Both individual and institutional investors pulled their money away from companies with operations in South Africa.

The combined efforts of protests and responsible investing paid off, with a massive \$625 billion worth of investments redirected from South Africa by 1993. This led to economic instability, which contributed to the eventual collapse of apartheid.



The 1980s to 1990s

In the 1980s, environmental concerns started to gain more attention in the wake of disasters like Bhopal and Exxon Valdez. People also became more aware about the threat of climate change. The investment market began to pick up on the growing need for products geared towards what was becoming known as the 'responsible investor'.

In 1997, John Elkington, co-founder of the business consultancy SustainAbility and considered one of the founders of the global ESG movement, published 'Cannibals with Forks: the Triple Bottom Line of 21st Century Business'. He pointed to the emergence of non-financial considerations which should be included in the factors determining a company or equity's value. He coined the phrase the 'triple bottom line', referring to the financial, environmental and social factors included in his new calculation, often referred to as 'people, profit and planet'.

Another important publication came in 1998, when two journalists Robert Levering and Milton Moskowitz brought out the 'Fortune 100 Best Companies to Work For'. This discussed the best-practicing companies in the U.S. in terms of corporate social responsibility, and looked at how their financial performance fared as a result. In the years after it was published, the list was widely circulated and had an impact on companies' ease of recruitment and brand reputation. This started to challenge the assumption that ethically directed investments were likely to reduce financial return.

Some of the world's largest banks and investment houses started to respond to the growing interest in the responsible investment market with the provision of sell-side services. The tide was slowly but surely starting to change on responsible investing.

The new millenium

A big moment for ESG investing came in January 2004 when former UN Secretary, General Kofi Annan, wrote to over 50 CEOs of major financial institutions. He invited them to take part in a joint initiative to find new ways to integrate ESG into capital markets.

A year later, the initiative produced a report called 'Who Cares Wins' by Ivo Knoepfel. It argued that embedding ESG factors in capital markets made good business sense and would lead to more sustainable markets and better outcomes for societies.

At the same time, the UNEP produced the 'Freshfield Report' which showed that ESG issues were relevant for financial valuation.

These two reports formed the backbone of the launch of the Principles for Responsible Investment (PRI) at the New York Stock Exchange in 2006, and the



launch of the Sustainable Stock Exchange Initiative (SSEI) the following year.

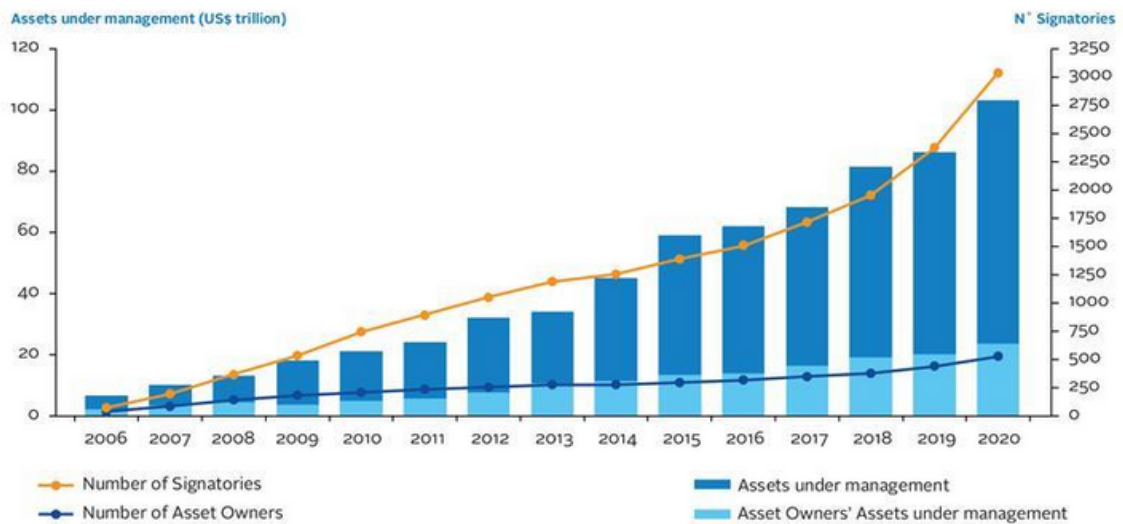
The PRI's aim is to advance the integration of ESG into analysis and decision-making through thought leadership and the creation of tools, guidance and engagement. They are backed by the UN and, today, count with over 3,000 signatories. The SSEI has also grown massively over the years. Many exchanges are now mandating ESG disclosure for listed companies, or providing guidance on how to report on ESG issues.

2010-2020: growing support

In the last 10 years, responsible investing has evolved rapidly. Environmental, social and governance issues have moved from the sidelines to the forefront of decision-making for asset managers and institutional investors.

In 2019, CEOs from 181 of the world's largest companies, as part of the lobbying group The Business Roundtable (BRT), declared that the purpose of a corporation is not just to serve shareholders but 'to create value for all our stakeholders'. This signalled a drastic U-turn from Milton Friedman's previously widely accepted theory, and can be seen as a real tipping point for ESG.

The chart below shows the significant increase in recent years of the number of PRI signatories and asset owners, as well as their assets owned or under management, now approaching \$100 trillion.



ESG-managed investments surpassed 25% of all professionally managed investments in 2019 and, at current growth rates, will become the majority of managed assets by 2025.

This trend seems inevitable to continue as regulation across the globe, like the EU's Sustainable Finance Disclosure Regulation (SFRD), in force since 10 March 2021,

effectively forces disclosure on how financial products consider sustainability and the overarching 'do no harm' principle.

Now we've had a look at the origins and evolution of responsible investing, it's time to explore the term this guide is dedicated to: ESG.



ESG: the need-to-know

What is ESG?

Let's start with the basics.

ESG stands for environmental, social and governance criteria, and it's pivotal to the way today's businesses operate. It's all about a company's business model, and how its products and services contribute to sustainable development.

- E: environmental criteria involves the impact a company has on the planet
- S: social criteria revolves around people and reputation
- G: governance criteria is all about how a company is managed

If you'd like to know more about any of these specifically, head straight to our sections dedicated to 'E', 'S' and 'G' respectively.



What is ESG investing?

Put simply, ESG investing is the consideration of environmental, social and governance factors alongside financial factors in the investment decision-making process.

These factors cover a wide range of issues that are not traditionally part of financial analysis, but can have financial relevance.

This might include things like:

- How corporations respond to climate change
- How good they are with water management
- How well they treat their workers

(There's a whole lot more than this, but we'll get into that later.)

ESG investing is growing exponentially. As recently as 2019, ESG-driven investment was estimated at over \$20 trillion, or around a quarter of all professionally managed assets around the world. Estimates for 2020 more than double this figure to \$45 trillion, and it has been projected to reach more than half of all assets under management by 2025.

Gema Esteban, Global Head of ESG at IG4Capital, gave us an excellent explanation of ESG:

“ESG is about delivering value to all of your stakeholders, considering the impact your company is having both on people and on the planet, and going above and beyond to behave responsibly. By doing so you are delivering better returns and stability for your assets.”

Real estate investment and ESG adoption

Over the last two decades, ESG investing has started to extend beyond financial investments and into real estate as an asset class.

This is demonstrated by the fact that the percentage of green-certified space in the top 30 US office markets has gone from about 5% in 2005 to over 42% in 2019.

The establishment of GRESB in 2009, providing standardised data and a benchmark for ESG-driven real estate and infrastructure investments, is another important milestone which has grown to represent ca. \$5 trillion in real assets value in 2020. This clearly reflects the widespread institutional adoption of the ESG mentality in real estate investment.



If you look at the current ESG landscape, it's clear that some of the biggest technological leaps and transformative technologies in the field have their prime application in the built environment. This is particularly the case with IoT, which has grown massively in popularity in recent years.

It therefore seems likely that real estate will be one of the asset classes where the contrast between ESG winners and losers will be the starkest, both from an operational and financial point of view. The investors and facility managers who start future-proofing their portfolios and buildings now will create solid foundations for above-average performance and stability.

Even today, the World Bank makes the case that green buildings can yield up to 23% higher occupancy rates, 8% higher rental income and 31% higher sale premiums than traditional buildings. This premium is only going to grow from here as stricter regulation and consumer demand effectively pose an existential risk of obsolescence to 'brown' assets and portfolios that fail to adapt.

Thankfully, the outcome is not set in stone. PropTech and IoT can channel disruptive technologies to make it quick, easy and cost-effective for owners, managers and occupants to retrofit existing buildings and turn them into sustainable, efficient and healthy assets.

The United Nations' Sustainable Development Goals

In 2015, the United Nations introduced their 17 Sustainable Development Goals (SDGs) which they describe as a 'blueprint to achieve a better and more sustainable future for all'. There are many parallels between these goals and ESG objectives, which is helping to drive improved regulation in this area.

Many governments are using this framework to develop their political policies, and lots of the world's largest companies acknowledge the SDGs in their corporate reporting and include the global goals in their CEO's message.

It's clear that the SDGs create many opportunities for both investors and companies. They offer an effective way to look at opportunities and risks, and can provide a framework for pursuing sustainable long-term value creation. They also provide the structure needed for companies to integrate sustainability information into their reporting cycles, providing more information to both investors and shareholders.

You can see an overview of the 17 goals below, and we will take a closer look at several of them later in this guide.





PropTech can be directly and particularly effective when it comes to SDG numbers 3 (Good health and well being), 8 (Decent work and economic growth), 9 (Industry, innovation and infrastructure), 11 (Sustainable cities and communities) and 13 (Climate action).

It can also benefit from and contribute to other SDG goals such as number 5 (Gender equality), 6 (Clean water and sanitation), 7 (Affordable and clean energy) and 12 (Sustainable consumption and production).

Why is ESG investing growing?

There are loads of reasons for the growth in ESG investing. We've broken down some of the main ones for you.

1. The world is changing

Global sustainability challenges like rising sea levels, data security, demographic shifts, and regulatory pressures are introducing new risk factors for investors.

As companies face deepening complexities on a global scale, investors are increasingly feeling the need to reevaluate traditional investment approaches.

2. Awareness is growing

We only have to look at the news to see stories about issues like climate change, racial inequality and poor working conditions. And this increased awareness is making many of us want to take real action.

As much as we can make a difference with our individual actions, it's clear that large companies can play a pivotal role in either improving or exacerbating these issues.

Investing in companies with a good ESG rating can help us to know that our money is helping towards sustainable development.

3. Investors are changing

It is becoming increasingly apparent that the attitudes of investors are shifting. Gema Esteban, Global Head of ESG at IG4Capital, explains:

“In ESG investing a new breed of investor is redefining the parameters of the capital markets. This kind of investor is not only driven by profit, but is mission driven and seeks to shape a better world to leave behind for the next generation.”



A growing body of research suggest that millennials and women, both relatively new to investing, are asking more of their investments.

- \$68 trillion will change hands to younger generations over the next 25 years
- 67% of millennials believe investments 'are a way to express social, political, and environmental value' (vs. 36% of baby boomers)
- 71% of millennials would turn down the opportunity to make a significant sum of money if it required investing in a company with a negative impact on society or the environment
- 85% of individual investors are interested in sustainable investing
- 95% of millennial investors are interested in sustainable investing

Investors like BlackRock's CEO, Larry Fink, are increasingly pressing companies to focus on their purpose and how they contribute to society. In an open letter to CEOs, Fink explains:

“As more and more investors choose to tilt their investments towards sustainability-focused companies, the tectonic shift we are seeing will accelerate further. And because this will have such a dramatic impact on how capital is allocated, every management team and board will need to consider how this will impact their company’s stock.”

4. Data and analytics are evolving

We now have access to better data and better ESG research and analytics capabilities. And this enables more systematic, quantitative, objective and financially relevant approaches. New technology based on machine learning and big data can also unlock valuable insights.



The market for ESG information is definitely maturing and while the quality is not always perfect, it's getting better all the time. Alex Edds, Director of Innovation at JLL, told us:

“Once you can measure something, you can manage it. We are only just starting to see the beginnings of that evolution, and going forwards I truly believe that increased data transparency will make us rethink everything.”



Why is ESG investing growing?



01

The world is changing

02

Awareness is
growing

03 Investors are
changing

04 Data and
analytics are
evolving

How can ESG factors add financial value?

Research has shown that ESG factors contribute to long-term financial performance. ESG research can be used to identify companies that are well-managed and likely to succeed, and to flag companies with business models that are likely to face issues in the near future.

A growing body of evidence suggests that these principles translate directly to real estate assets and investments. Institutional investors are increasingly looking to ESG factors as a way to manage risks and to achieve long-term sustainable financial performance.

How does ESG create financial value?

01 Higher profitability

Companies with high ESG ratings tend to be more competitive and generate abnormal returns. This can lead to higher profitability and dividend payments, especially when compared to companies with particularly low ESG ratings.

In real estate, ESG considerations result in significant operational savings, increased employee productivity, reduced absenteeism, lower rental and servicing costs, greater occupancy, tenant retention and rental yields and higher resale values.

02 Increased funding and lower cost of capital

Ensuring good ESG performance can also make it easier and cheaper for companies to receive funding, both from private and public financial institutions alike. Green bond initiatives such as those of the [Bank of England](#) and [ECB](#) show that ESG will increasingly assert itself over capital markets policies, with deep implications on the cost of capital.

Similarly, many of the pandemic-related recovery programmes like the [Recovery Plan for Europe](#) and the [Biden's Administration American Jobs Plan](#) have been created with a big emphasis on sustainable buildings, infrastructure, and technologies. A further corollary to this is that, at some point, companies and/or real estate buildings with low ESG ratings may struggle to find financing at all.

A group of [35 big investors managing \\$11tn in assets](#) recently called on global banks to stop financing carbon-intensive projects and to scale up their green lending. As time goes on, it is clear that this pressure will continue to mount.



03 Lower tail risk

Companies with high ESG ratings often experience a lower frequency of idiosyncratic risk incidents, the likes of which can result in major drawdowns, and sometimes involve civil or criminal liability, or major conflicts with stakeholders.

When it comes to real estate, a comprehensive ESG approach can also minimise large adverse risks. There are some distinct examples of idiosyncratic risk (such as the poor governance surrounding the tragic Grenfell incident), and there are undoubtedly some assets that will be particularly exposed to climate change and natural disasters.

However, the main tail risk for most real estate portfolios is likely to be the risk of accelerated obsolescence, due to regulatory requirements and consumer demand, which can lead to dramatic drops in occupancy and value, as well as suboptimal operational costs. ESG and PropTech can be particularly effective in future-proofing buildings and portfolios against this risk.

04 Lower systematic risk

Companies with high ESG ratings usually have lower systematic risk exposure, creating less volatile earnings and less systematic volatility. They also tend to experience lower betas and lower costs of capital. Specifically to real estate, researchers have found lower levels of asset volatility both in newly built green buildings as well as in green retrofitted-buildings.

In addition to looking at existing ESG ratings, investors can also consider changes in ESG ratings. This concept, known as ESG momentum, has been shown to outperform the general markets. UBS have published research showing how ESG momentum can be implemented into a traditional investment approach.



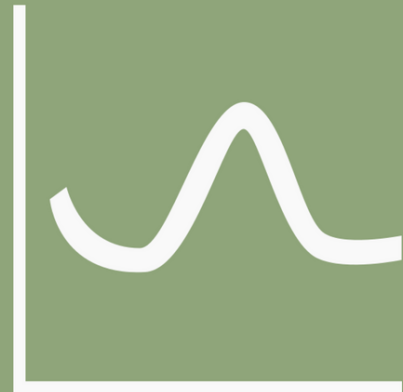
How can ESG factors add financial value?

Increased funding and
lower cost of capital



Lower tail risk

Lower systematic risk



Higher profitability



Active vs passive ESG investing

Traditionally, ESG investment has been implemented via active strategies, where a fund manager uses its experience and discretion to select investments they consider to be attractive, in order to outperform a benchmark or achieve a bespoke investment objective. To date, most forms of direct real estate investment are also considered to be active investing.

Passive investing, by contrast, focuses on owning a portion of every investment within a given index to match the performance of such an index. In recent years, there has been a significant rise in passive investment, as well as an emergence of various new indices linked explicitly to ESG.



There are already a number of financial indices available to investors seeking to invest passively in an ESG approach. One of the most well-known is the [FTSE4Good Index Series](#), which follows the performance of companies demonstrating strong ESG practices.

Top investment funds like [Vanguard](#), [BlackRock](#) and [Transamerica](#) have also recently launched passive ESG funds, providing global exposure to investment markets with an ESG tilt.

Interestingly, we're starting to witness a similar transition in the world of real estate over the last couple of years, and in particular real estate investment trusts (REITS). The first wave of ESG-driven, real estate focused indices leading to investable products is starting to become more popular, with [GRESB leading the way](#).

What are the barriers to ESG investing?

While ESG investing has risen massively in recent years, there are still a few common barriers that remain.

Some of these issues relate to investor views on their fiduciary duties, prospective returns or simply skepticism about the accuracy of ESG denominations:

- One argument is that by reducing the investable universe (through ESG filters), investors might be unwittingly compromising choices and reducing expected returns
- Some investors believe that their fiduciary duty is limited to the maximisation of shareholder values irrespective of environmental or social impacts, or broader governance issues such as corruption
- The way in which some ESG funds are built can easily lead to outcomes that are almost indistinguishable from general indices, and/or include unexpected stocks
- There are concerns about 'greenwashing', the practice of claiming to be sustainable but not actually doing much about it

The good news is that several regulatory initiatives, including the SEC and the EU's SFDR, are actively working to limit the scope of the more concerning of these issues. In any event, the above arguments tend to have far less bearing when it comes to real estate investing. This is especially the case with direct investment, as the data supporting the economic case for ESG is surprisingly robust and green certifications offer a solid way to know what you are getting.

A large majority of the issues surrounding ESG concern the data itself:

- Not all ESG factors are easily quantifiable
- There are often discrepancies between rating providers' scores
- Current corporate sustainability disclosures are heavily skewed towards process and procedures and not towards actual performance
- Applying the same set of factors to companies in different geographies and industries with varying business practices can be challenging
- Different regions have varying challenges with regards to data quality that need to be considered, especially emerging markets
- ESG datasets are disclosure-based, binary and unverified
- The ratings companies follow different methodologies in arriving at ESG scores
- ESG research can be backward-looking and may fail to capture anticipated changes

More than half (53%) of global respondents to a BlackRock survey cited concerns about 'poor quality or availability of ESG data and analytics' as their biggest barrier to adopting sustainable investing, higher than any other barrier that was tested.



Traditionally, these very same problems used to plague ESG investment in real estate. However, the way in which green certifications have evolved over the years have effectively created adequate frameworks to be able to be specific and measure many aspects of ESG.

How can PropTech and IoT help with ESG?

As we've mentioned, collecting accurate ESG data can be problematic. Luckily, when it comes to buildings, PropTech can provide a cost-effective solution to the collection of data.

ESG metrics can be measured and collated with precision with IoT sensors, tracking traditional green building metrics like:

- Carbon footprint
- Energy efficiency
- Water quality and usage
- Waste management

In addition, new developments in sensor technology now permit the accurate measurement of additional metrics such as:

- Indoor air quality, not just temperature and humidity but a wide range of factors that can have a profound effect on occupant health, wellbeing and productivity
- Space utilisation, which can be used with more traditional metrics to substantially decrease the environmental footprint per employee

A smart building platform can collate all of this information in one place, providing a complete empirical picture of the space. This gives companies secure and accurate data at their fingertips, including information about their building, people, safety, maintenance, and more.

We spoke to Matthew Marson, Sector Director for Manufacturing & Technology and the Buildings Design Practice at Arcadis. He highlighted how smart technology can help with ESG assessment:

“The problem with ESG is proving it. That’s exactly what IoT is good for... it’ll demonstrate, with data, the improvements that an organisation has made and therefore their ESG credentials.”



Marson went on to explain the way in which PropTech removes any guesswork and improves efficiency:

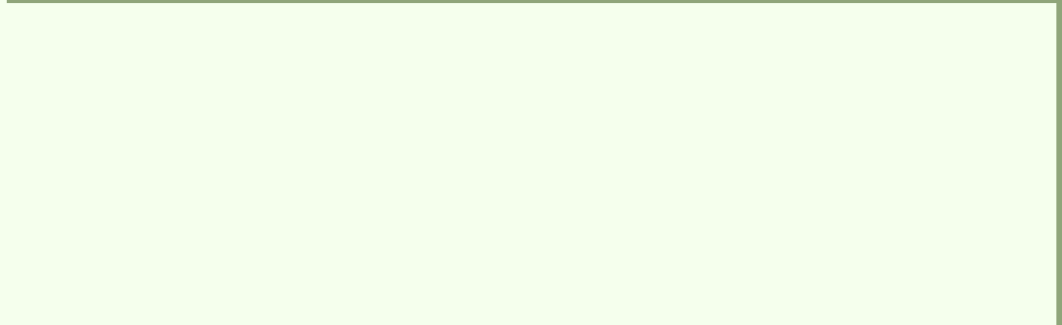
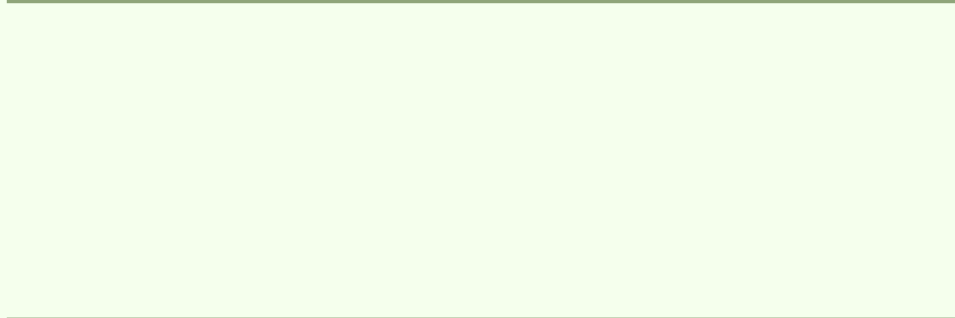
“Anecdote or hunch is not enough to invest in an overhaul of your building. That’s where PropTech comes in. The right blend of hardware, software and your own thinking is how you can prove your hunch, model out the result and build the business case. That could be anything from reducing your energy consumption (using some proper cloud-scale analytics), doing more with space (using some quality occupancy sensors) and getting a longer life from your assets (by delivering digital services where people want to be).”

PropTech basically enables you to know whether a space is performing sustainably, or if steps need to be taken to improve ESG ratings and avoid any potential negative consequences.

The best thing about it is: not only does PropTech help to prove the sustainability, reputation and resilience of a space, it can also help companies to save money and provide a healthier indoor environment for occupants.



Putting the 'E' in ESG



What is the 'E' in ESG?

The 'E' in ESG is all about a company's influence on the environment and its ability to mitigate any risks that could potentially harm our planet. And the impact a company has doesn't have to be direct, as it includes their supply chains too.

Environmental factors used to be on the sidelines, but they're now an important consideration in all parts of our lives, and a key driver of decision-making. Issues like carbon emissions and water scarcity have the potential to interfere with economic growth on a global scale.

Companies that fail to consider the impact they're having on the environment are likely to be exposed to much higher levels of financial risk. For example, if they don't take appropriate measures to reduce CO2 emissions or to protect against incidents like mining explosions or oil spills, they can face governmental sanctions, criminal prosecution and reputational damage.

There are many different environmental factors that might be considered, but we've opted to focus on the following:

- Climate change
- Energy efficiency
- Land use change
- Plastics
- Water
- Fracking
- Methane
- Biodiversity

Climate change

Climate change is probably the highest priority environmental issue faced by investors (and all of us). It's thought to increase the frequency of events like hurricanes, floods, heatwaves and wildfires. This adds an extra layer of uncertainty when it comes to measuring how sustainable a company really is.

Failing to consider climate change can lead to significant financial implications. Companies need to plan for the future, think about using new sources of energy, and limit their carbon footprint.

Land use change

Land use change is basically just converting a piece of land's use from one purpose to another. Deforestation is a common example of this, and it has a hugely detrimental impact on the environment. At least two-thirds of tropical deforestation is driven by:

- Cattle
- Soy (primarily to feed cattle and other livestock)
- Palm oil
- Timber

Land use change represents a risk to



companies and investors looking to create long-term value. Beyond climate-related risks, companies that are linked to land use change can face reputational risks, legal risks and market access risks.

Plastics

With an increase in global production and consumption of plastics, plastic waste is increasing, and poor waste management is a real issue. There are lots of environmental and economic risks associated with plastics, as well as increasing legal requirements that companies need to meet.

A United Nations report shows that more than 60 nations have taken steps to reduce single-use plastics by imposing bans or taxes. Companies need to act now to reduce how much plastic they're producing.



Water

Water is a basic human right that's fundamental to the functioning of the global economy. Increasing demand and competition, climate change and pollution are putting pressure on global water resources. This creates risks for business and society, which in turn generates risks and opportunities for investors.

Agriculture is the world's largest user of water, so companies with direct operations and supply chains that are dependent on agriculture are exposed to water risks.

Companies that mitigate these sorts of risks and demonstrate good water stewardship characteristics are much more likely to create value for their shareholders.

Fracking

Fracking is revolutionizing the oil and gas drilling industry. The Shale Revolution saw production of oil and gas from fracked wells soar in the US in the past decade, and natural gas is seen as a cleaner fuel compared to coal.

However, fracking has also become a contentious method. The market and regulations are constantly changing, and there are several risks to consider:

- Operational and physical risks
- Methane and other greenhouse gas emissions leaks
- Reputational risk and social license to operate
- Policy and regulatory risks

It's important for companies to minimise these risks and ensure fracking is always done safely to avoid financial risk and volatility.

Methane

Methane is 84 times more powerful as a greenhouse gas than CO₂ over a 20-year period, and it's responsible for about 25% of the global warming we are experiencing today.

The main sources of anthropogenic methane emissions are:

- Oil and gas industries
- Agriculture (including fermentation, manure management, and rice cultivation)
- Landfills
- Wastewater treatment
- Emissions from coal mines

Due to their climate disrupting impacts, methane emissions have drawn increasing scrutiny from the public, environmental and health groups, and global policymakers. This endangers the industry's social license to operate and increases regulatory risks.

Biodiversity

Biodiversity is the variety of living components that we find in nature. Nature provides something known as ecosystem services, which are things that benefit businesses and society. The assets that underpin these services are called natural capital.

Biodiversity loss can reduce the quantity, quality and resilience of ecosystem services and can present risks to investors across many sectors. Companies play a role in ensuring the resilience of natural capital assets and securing them for the future.

How can PropTech and IoT help?

Companies need to focus on improving their energy efficiency, and PropTech can be extremely useful when it comes to reducing consumption and meeting targets.

Buildings and construction are responsible for 39% of global carbon emissions, with energy used to power buildings accounting for 28%.

Smart technology can monitor performance, detect inefficiencies, make automatic adjustments via a Building Management System (BMS), and facilitate better decision making.

And importantly, a smart buildings platform like Metrikus brings all of this data into a single place so that performance can be traced with accuracy. It's easy to see whether or not a company is hitting its targets, and steps can be taken to improve efficiency at every opportunity.

Nick Robinson, Founder of NJRobinson Consulting and Co-Founder of SynerG, spoke to us about his surprise that this kind of technology isn't being used more often:

"I'm honestly surprised more people aren't using technology to make things smarter and more efficient. It's a win-win situation: help the planet, save some money, and grow your revenue."

- How can PropTech make our buildings and cities more sustainable?
- Five ways that IoT can help with sustainability.



As well as improving energy efficiency, IoT technology can help cities and companies to become more sustainable and reduce their environmental impact in a huge variety of ways.

- AI-enabled traffic lights can adjust automatically to the volume of traffic, reducing the number of idling cars, a major source of greenhouse emissions
- IoT sensors can be used to monitor crops and soil to maximise crop production while maintaining a low impact on the environment
- Large forest areas can be monitored and protected using AI-enabled drones
- IoT sensors can monitor air pollution in real-time, enabling sources of pollution to be identified promptly and accurately
- Cameras or motion sensors can be used to monitor known poaching paths and reduce poaching activities significantly
- IoT technology can improve access to clean water by reducing leakages and monitoring water quality



Putting the 'S' in ESG



What is the 'S' in ESG?

The 'S' in ESG considers how a company manages relationships with its workforce, and the society and political environment it operates in. Investing in companies that pay attention to these social issues can enable investors to reflect their own values, and lead to higher and more reliable returns.

There are various social factors that can affect a company's financial performance, so we've just picked out some of the key ones for you.

Employee relations

Matters relating to employees form a big part of the 'S' in ESG. Companies are assessed on a range of factors to determine if workers are being treated fairly.

Labour strikes can directly affect a company's profitability by creating a scarcity of skilled employees. And if workers aren't treated well, it can cause controversy that is damaging to a company's reputation.

Here are some of the key factors that tend to be considered:

- Meaningful workforce engagement
- Access to union or works council
- Equality, diversity and inclusion
- Maturity of workforce
- Staff turnover rate
- Talent attraction and retention
- Training and qualification
- Health and wellbeing

Customers and product liability

Like employees, customers also regularly appear across ESG ratings agency criteria. The success of many

companies depends on their customers and the quality of their product, so it makes sense that these factors can have a big impact on financial performance.

Some things that might be assessed include:

- Customer experience
- Product quality and safety
- Access and affordability
- Health and safety
- GDPR and data protection

Community and society

The 'S' in ESG also considers the impact companies have not just on their immediate surroundings, but within a global community. Understanding this can help to avoid volatility and reputational damage.

Factors that could be worth looking into include:

- Community involvement and relations
- Hiring local workers
- Tackling challenging social issues
- Behaving responsibly in conflict-affected and high-risk areas



Human rights

In an increasingly globalised world, companies often operate in areas with varying degrees of protection for employees, communities and consumers.

This brings significant challenges, especially when there are complex supply chains. But companies across all sectors have a duty to have clear policies on respecting human rights, to avoid issues like:

- Child labour
- Forced labour
- Modern slavery

How can PropTech and IoT help?

In recent years, the global investment community has shown a clear focus on environmental and governance factors. However, social aspects have proven much more difficult to define and measure.

Monitoring and improving indoor air quality is an easily quantifiable step to optimise employee health, wellbeing and productivity. This relates to UN Sustainable Development Goal 3, which is 'Good health and wellbeing' and often refers to health at work.

Monica Chao Janeiro, Country Sustainability Manager at IKEA in Spain and President of Women Action Sustainability (WAS), told us:

“When we talk about sustainability, the wellbeing of people is essential. Indoor air quality is becoming increasingly important for safe, productive work areas and for optimal use of spaces.”

This is once again where PropTech comes into its own. Using smart technology, companies can monitor key parameters with a broad impact on occupant health and wellbeing including:

- Temperature
- Humidity
- Carbon dioxide (CO₂),
- Total volatile organic compounds (TVOCs)
- Particulate matter (PM_{2.5})

Smart alerts can then notify you when indoor air quality factors deviate from their optimal zone, so that steps can be taken to maintain a safe, healthy and productive working environment.



Indoor air quality monitoring

Indoor air quality monitoring can have a huge impact on occupant health, wellbeing and productivity. To make things clear, here's a quick breakdown of some of the key parameters and how they can impact us.

Temperature and humidity

When properly tracked and reflective of what the building occupants are experiencing, optimal temperature and humidity levels can help avoid significant health issues like increased risk of infections, asthma, allergies, dry skin and eyes, and sick building syndrome. They are also key variables in the comfort, wellbeing and productivity of occupants, with studies showing that every degree outside of a narrow optimal band can decrease worker productivity by 2%.

Particulate matter (PM2.5)

Fine particles can penetrate deep into the lungs and bloodstream. Short-term exposure can cause irritation of the airways, coughing and cardiovascular problems. Long-term exposure can cause premature death from heart and lung diseases, including cancer. For every 10ug/m³ increase in levels of PM2.5 above the WHO guideline, life expectancy can shorten by a year.

Carbon dioxide (CO₂)

Studies have shown that elevated levels of CO₂ can cause an 11% reduction in productivity and 23% impairment in decision making. Other short-term impacts include symptoms like headaches, drowsiness, and loss of concentration.

Total volatile organic compounds (TVOCs)

Short-term exposure to elevated levels of TVOCs causes adverse effects including eye and respiratory tract irritation, headaches, dizziness, visual disorders and memory impairment. There is association between higher concentrations of VOCs in indoor air with allergies, asthma, and poor respiratory health. Long-term effects include prolonged eye, nose and throat irritation, liver, kidney and central nervous system damage, and even cancer. Formaldehyde and benzene are considered by many authorities to be proven or probable human carcinogens.



Countless studies have shown the link between poor indoor air quality and the transmission of airborne viruses like COVID-19, as well as how long they can survive in the air. A recent study has even suggested that enhancing indoor air quality could be as effective in reducing aerosol transmission of viruses as vaccinating 50-60% of the population.

It's clear that by monitoring and improving their air quality, companies can create a far safer and healthier working environment. Juan Quintás, Board Member of Metrikus, believes that we will see a growth in real-time monitoring going forwards:

“Indoor air quality is the next frontier in sustainability. We will see more companies in the coming months adopting the real-time monitoring of air quality as a proxy for health and wellbeing for all stakeholders, improving the compliance of Sustainable Goal Development number 3”

Rather than making unsubstantiated claims about improving employee wellbeing, PropTech gives companies the data they need to prove they are actively doing something to optimise workplace health, wellbeing and productivity.

This will become particularly important as national regulations move towards broader measurements of air quality. The recent publication of the World Health Organisation's roadmap to improve and ensure good indoor ventilation in the context of COVID-19 is a clear example of a catalyst that will encourage a great focus on the quality of our indoor air.



Putting the 'G' in ESG

What is the 'G' in ESG?

The 'G' in ESG is about understanding governance risks and opportunities. These constantly change as social, political, and cultural attitudes continue to evolve.

Considering governance risks is critical, as poor governance practices have been at the heart of some of the biggest corporate scandals. And these scandals inevitably cause significant financial damage.

Governance is an umbrella term that encompasses so many different things, but we've picked out five of the main factors to explore.

Tax avoidance

Tax avoidance falls in the grey area in between tax evasion and tax efficiency. HMRC describes it as 'operating within the letter, but not the spirit, of the law'.

Companies regularly come under scrutiny for tax avoidance. It's often done through profit shifting, where profits are funneled to jurisdictions that charge lower tax rates instead of paying taxes where their earnings are actually generated. A good example of this is Starbucks, who had sales of £400m in the UK in 2012 but paid no corporation tax at all.

Tax avoidance can lead to reputational damage, litigation costs and penalties. Institutional investors have the power to deter companies from avoiding taxes, even if these practices may loosely be perceived to be within the law.

Executive pay

Executive pay is another big topic when it comes to corporate governance. High levels of executive pay, regardless of performance, continue to be the norm at many organisations.

In a recent report, Autonomy revealed that incomes in the UK are the ninth most unequal of the 40 most developed countries. They suggested that caps on excessive salaries should be introduced to save whole industries and redistribute wealth.

Executive pay needs to be aligned with performance and long-term strategy in order to protect and create financial value.

Corruption

Corruption scandals like bribery, fraud, rate and test rigging, can be catastrophic to companies. Every year, corruption losses represent over 5% of global GDP (\$2.6 trillion), with bribes exceeding \$1 trillion.

Companies involved in corruption scandals can suffer from:

- Damage to brand, reputation and share price
- Exclusion from potential business opportunities
- Liability to pay large fines
- Diversion of significant senior management time away from running the business to manage investigations and prosecutions



Implementing effective anti-bribery and corruption standards is not only a risk preventative or remedial measure, but can even help businesses by increasing the size of their market.

Director nominations

Director nominations and elections can be pivotal to the success of a company. An ineffective process can lead to major risks, including ineffective board members, or even entire boards that are just not fit for purpose.

There are also calls for more diversity on boards. More than a third of the UK's top companies do not have any ethnic minority representation on their boards and will struggle to hit diversity targets.

It's clear that systemic change is needed to ensure companies are building diverse talent pipelines all the way through their organisation. Doing so not only makes for a more inclusive workplace, but can often lead to greater financial success. A study found that diverse companies produce 19% more revenue.

Cyber security

Every organisation faces cyber security threats. And the COVID-19 pandemic has only increased these risks, with working from home acting as a gateway to new forms of data theft.

Even more concerning are attacks that target those directly involved in responding to the pandemic, like governmental agencies and healthcare providers. In 2020, a medical facility

that was testing a vaccine suffered a ransomware attack. Sadly, attacks like this are not new, with a cyber attack in 2017 costing the NHS a whopping £92m.

What is worrying is that the number and sophistication of attacks is constantly rising. And they can have wide-reaching impacts, from financial consequences to reputational, societal, physical and psychological ones.

Governance can be a pretty good indication of the strength of cyber resilience. If there are good governance structures and processes in place, a company is much more likely to be better prepared to prevent and address potential threats.



How can PropTech and IoT help?

To achieve good corporate governance, you need good data. Smart technology gives companies access to information about a huge range of factors. And what is absolutely key is the high quality of this data.

Effective corporate governance requires records and processes to be transparent and available

to shareholders and stakeholders. A smart buildings platform allows information to be presented to key figures in a way that is not only easy to understand, but easy to interpret and make decisions from.

The right technology can also help to break down data silos, bringing data from different systems into one place and creating more streamlined and collaborative processes.

Another slightly less obvious way in which PropTech can help with the 'G' in ESG is by increasing gender equality in the workplace. Smart technology enables companies to implement an effective hybrid workplace model, allowing employees to decide their own 'when and where' when it comes to work.

This can increase gender equality by giving women the flexibility to work remotely when needed. This has the potential to help with Sustainable Development Goal 5, which is 'Achieve gender equality and empower all women and girls'.

It is clear that when it comes to ESG, the value of PropTech reaches far and wide.



ESG ratings, sustainable indices and green certifications

Defining and measuring ESG performance

With an ever-growing interest in ESG factors, investors need an objective way to assess the ESG performance of a company.

Companies are evaluated based on publicly available information including media sources and annual reports, as well as information produced by NGOs, governmental organisations or trade unions.

Scores are given for 'E', 'S' and 'G', along with an overall score. These scores are used by investors as a proxy of ESG performance. Companies that with a good ESG rating are thought to:

- Better anticipate future risks and opportunities
- Be more disposed to longer-term strategic thinking
- Be focused on long-term value creation

ESG rating agencies

Unlike financial rating agencies, ESG rating agencies are paid by investors. Most of them are the result of mergers or acquisitions of long-standing agencies set up in the 1990s.

Some of the leading international agencies include:

- [GRESB](#)
- [Vigeo \(France\)](#)
- [MSCI ESG Research \(US\)](#)
- [EIRIS \(UK\)](#)
- [Inrate \(Switzerland\)](#)
- [Sustainalytics \(Netherlands\)](#)

If you're interested, this is a very thorough [guide to the different agencies](#).



Sustainability indices

No two sustainability indices are the same, and they have the potential to measure a huge range of factors.

There are dozens of indices out there, but some of the most influential include:

- [Dow Jones Sustainability Index](#)
- [FTSE4Good](#)
- [Euronext Vigeo World/Eurozone/Europe 120](#)
- [Ethibel Sustainability Excellence Global/Europe Index](#)
- [MSCI ESG Leaders Indexes](#)
- [MCSI Global Climate Indexes](#)
- [Stoxx Global ESG Leaders](#)
- [Bloomberg Gender-Equality Index](#)

They're sometimes presented as an open list, limited to a specific number of companies, as is the case with the Dow Jones Sustainability Index. On other indices, like the FTSE4Good, the companies are revealed one by one.

What they all share is an objective to show the public which companies are acting responsibly and sustainably.

Green certifications

Green certifications are the building equivalent of ESG ratings for companies. They can attest the environmental and/or wellbeing impact of a project or building at any stage from design, to construction, to operation.

Traditionally, green certifications have focused on the environmental component of ESG, with an emphasis on energy efficiency, CO2 emissions, water usage, waste recycling and the sustainability of the materials used. Some of the pioneering certifications in this category include [Energy Star](#) and [LEED](#) in the US, [Nabers](#) and [Greenstar](#) in Australia, and [BREEAM](#), originally in the UK.

Over time, many of these traditional certifications have evolved in three directions:

1. Expanding their remit to an international audience
2. Incorporating other factors beyond the pure environmental ones, particularly air quality
3. Adding different types of subcategories to reflect the idiosyncrasies of different types of real estate (commercial, retail, residential, infrastructure, etc.)



Health and wellbeing certifications

As well as green building certification, there are also several newer certifications that focus on the impact of buildings on the health, wellbeing and lifestyles of its occupants.

For example, versus traditional benchmarks, WELL v2 considers concepts like air, light, thermal quality, nourishment, movement, mind and community. Fitwel aligns itself over strategies for each part of the building and also emphasises a broad concept of air quality, thermal and noise comfort, together with a host of other elements including location, accessibility, indoor and outdoor facilities, water and food access, and emergency preparedness.

There are also specialised certifications that focus on a single area of interest, like AirRated which is dedicated to assessing indoor air quality. Certifications such as these can be highly cost-effective and can immediately contribute to GRESB scores, as demonstrated by the fact that both the AirScore and AirScore D&O were included as accredited building certifications for the 2021 GRESB reporting cycle.

In due time, building owners can use an initial AirRated certification to provide a bridge to WELL or Fitwel, as it's been acknowledged to cover the air quality aspects within those broader, but also more time consuming, certifications.

It seems likely that crosswalks between certifications will continue to be announced, such as that between BREEAM USA and Fitwel, who have specific areas where credits are acknowledged by both organisations.

How can ESG ratings and green certifications be used?

ESG ratings can be a very valuable internal benchmarking tool to guide decision making and improve sustainability performance. They provide an independent view of your performance, and how it compares to your competitors. It can be a great incentive for promoting change, and helps to highlight any particular strengths or weaknesses. A good rating can also help you to attract investment, especially if you continue to improve year-on-year.

The consequences of a poor rating can also be significant. If your company receives a poor rating from one ESG data provider, your stock may be considered an 'unsustainable asset' by investors and excluded from their investment portfolio. If multiple investors follow this reasoning, it can have a really negative impact on your stock price.



When it comes to green certifications, there is surprisingly consistent and robust data about the benefit of being certified. In studies to date, the results are unequivocal: certifications result in strong valuation premia, lower asset volatility, higher rental yields and tenant retention rates.

As we mentioned before, the World Bank makes the case that green buildings can yield up to 23% higher occupancy rates, 8% higher rental income and 31% higher sale premiums in new builds. And even conservative figures for retrofitted green buildings consistently show a hefty premium of 10-20%.

Given that the new breed of 'healthy' (as opposed to just 'green') certifications is still a relatively new phenomena, there isn't yet much data in terms of resale values. However, anecdotal reports suggest significant rental uplifts of ca. 20% (about twice the effect on traditional green certifications). This is also combined with savings in operational costs, which in the future will likely translate into a strong resale premium.



ESG reporting

One of the hottest and most complex topics in ESG is how to report on non-financial information. There are currently so many different initiatives, requirements and standards that it can be hard to sift through the noise and work out what's what.

The Esade Corporate Governance Centre and PwC have compiled a very helpful report in Spanish, "[Reporting ESG – Guía práctica para su correcto comprensión y aplicación](#)".

We thought we'd share some of the key information, to give you an idea of what's going on in the complex world of ESG reporting.

What are the main frameworks for ESG reporting?

Some of the main reporting frameworks and standards include:

1. Global Reporting Initiative (GRI)

Mostly used in Europe, the GRI is an international independent standards organization that helps all stakeholders to understand and communicate their impacts on issues such as climate change, human rights and corruption.

2. Sustainability Accounting Standards Board (SASB)

The SASB is an independent non-profit, whose mission is to develop and disseminate sustainability accounting standards that help public corporations disclose useful information to investors. It is the most widely used reporting standard in the US.

3. Integrated Reporting (IR)

Integrated Reporting (IR) has been developed and promoted by the International Integrated Reporting Council (IIRC), a global coalition of regulators, investors, companies, standard setters, accounting professionals and non-governmental organizations.

4. Task Force on Climate-Related Financial Disclosures (TCFD)

The TCFD was created in 2015 by the Financial Stability Board (FSB) to develop consistent climate-related financial risk disclosures for use by companies, banks, and investors in providing information to stakeholders.



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5. World Economic Forum (WEF)

In September 2020, the WEF and its International Business Council (IBC) released the Stakeholder Capitalism Metrics, a set of ESG metrics and disclosures that measure long-term enterprise value creation for all stakeholders. It's not a standard, but a set of practical recommendations identified from existing standards like GRI and SASB.

6. European Financial Reporting Advisory Group (EFRAG)

The EFRAG's Sustainability Reporting Board is currently drafting the European Sustainability Reporting Standards (ESRS), which are due to be submitted to the European Commission by October 2022.

How are global ESG standards taking shape?

There's lots of work being done to create a global standard for ESG reporting. PwC explain how things have progressed in Spain:

“In the first year of Law 11/2018’s application, many companies struggled to report on their non-financial information. However, in subsequent years, the processes for doing so have definitely been improving. Now, we need to focus on training those responsible and improving the consistency and comparability of data.”

In March 2022, the International Financial Reporting Standards Foundation (IFRS Foundation) and the Global Reporting Initiative (GRI) announced an exciting collaboration agreement.

This means that their respective standard-setting boards – the International Sustainability Standards Board (ISSB) and the Global Sustainability Standards Board (GSSB) – will start to coordinate their work.

Their aim is to create a comprehensive global reporting system that can be used by companies, investors, markets and stakeholders. The first standards are expected to be published by the end of 2022 – we will be keeping our eyes peeled for that!



EU sustainability reporting standards

The Corporate Sustainability Reporting Directive (CSRD) is the new EU legislation requiring all large companies to publish regular reports on their non-financial performance. This is a big step in the right direction for the EU to transition to a more sustainable economy.

It's expected to be approved in June 2022 and come into effect at the start of 2024, with a phased approach.

Companies will need to publish detailed, standardized data about:

- Environmental protection
- Social responsibility and treatment of employees
- Respect for human rights
- Anti-corruption and bribery and
- Diversity on company boards

They will also need to disclose their sustainability targets and green transition plans in line with the Paris Agreement.

There's a limited assurance requirement for the information to be audited, ensuring the reports are accurate and reliable.

The first set of standards will be adopted in October 2022 and apply to all large companies – whether listed or not:

- EU companies with over 500 employees and net €150 million worldwide turnover
- EU companies with over 250 employees and net €40 million worldwide turnover in high impact sectors, including textiles, agriculture, mining and minerals

This means that around 50,000 companies will need to publish reports, nearly five times more than before.

It's still undecided whether certain organizations – like non-European companies operating in Europe and subsidiaries whose parent companies need to report – will have to comply with the legislation.

US regulation of non-financial reporting

In the US, the Securities and Exchange Commission (SEC) has also made steps to streamline ESG reporting and make information more readily available to investors.

In March 2022, it announced an initiative that requires all US listed companies to report on an annual basis about how climate change affects their business, including:

- Environmental risk management
- Climate-related factors with a direct impact on the company and its finances
- Greenhouse gas emissions
- The objectives set out in the company's sustainability policy and the strategy defined to achieve them

The cost of climate-related events – like natural disasters and storms – will also need to be explained as a forecast in the company's future annual accounts.

The final rules are set to be established in the first half of 2022, and will come into force in 2023. If the proposal is adopted, it will have a significant impact on listed companies in the US, as only a third of them reported on this type of information in 2019 and 2020.

The role of data

Collecting traceable, reliable and auditable data about non-financial factors isn't always easy. This is why the Internet of Things (IoT) has such an important role to play in ESG.

IoT sensors can measure a wide range of metrics, including things like energy and water consumption. This high quality data is then collated and stored in the cloud, and can be verified by a third-party expert, which is incredibly useful, as auditing will become mandatory in the near future.

Company boards will be held accountable for ensuring the data in their sustainability reports is accurate and valid, so businesses need to implement IoT technology now to get ahead of upcoming legislation.

With the introduction of new standards and better access to high quality data, it definitely feels like we're a step closer to achieving a global consensus on ESG reporting.



Green buildings and healthy buildings

What are traditional green buildings?

The concept of a green building is often touted but rarely defined in a consistent way.

The version of green buildings most often enshrined in regulations is that of the energy-efficient building, or its more modern equivalent of nearly zero-energy buildings (NZEBs).

These are buildings with very low energy consumption due to the materials and designs employed, and which feed from mostly renewable sources for their residual energy needs, ideally from onsite or nearby facilities.

There are compelling reasons as to why regulators are demanding these types of features in a building. In fact, the Energy Performance of Buildings Directive makes it compulsory for every new building to be a NZEB from 2021 onwards across the European Union (and, unless repealed, in the UK as well). For new public buildings, the regulation has been in effect since 2019. Although it takes a softer stance with existing buildings, it still applies in the case of major renovations.

These initiatives are clearly crucial in our fight against climate change, as buildings and construction are responsible for 39% of global carbon emissions, with energy used to power buildings accounting for 28%. They are absolutely essential if we have any hope of reaching carbon neutral by 2050.

What are the features of traditional green buildings?

Traditional green buildings have a number of distinguishing features.

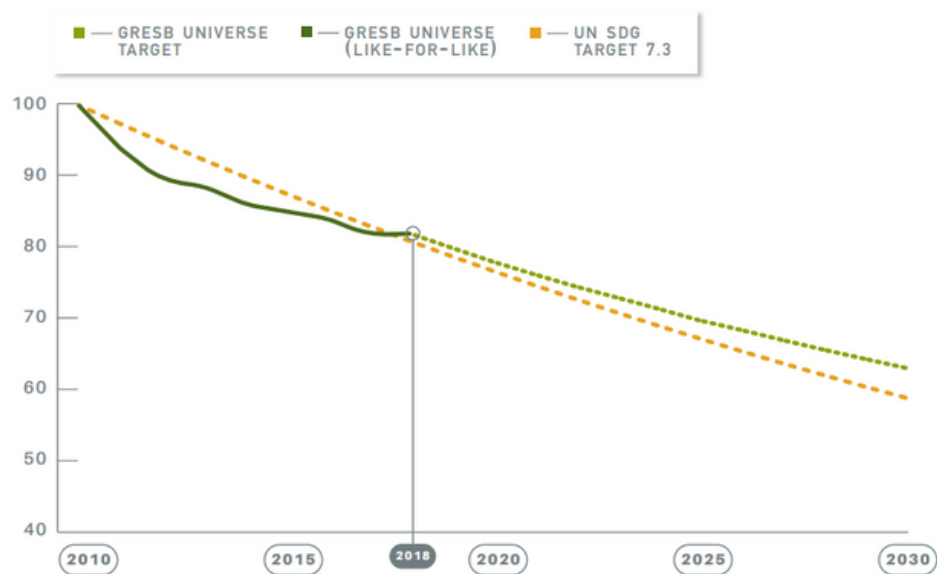


01

They focus on the 'E' in ESG

Traditional green buildings don't limit themselves to energy efficiency and low emissions. They often include policies around minimising and recycling waste, address water consumption and pollution, and ensure the sustainability of the materials used in the construction process.

They have undeniably achieved a good degree of success, as shown in the graph below from GRESB's 2020 report.



02

There is an emphasis on construction and design, rather than implementation and operation

Many of the thresholds set by traditional green building regulations look for efficient designs, which is sometimes to the detriment of the actual performance of such design when the building is delivered.

It's interesting to note how Australia has pioneered the push for modelling and simulation over the last two decades. This is only starting to catch up in the rest of the world, as evidenced for instance by the Design for Performance initiative in the UK. It's not enough to be designed to be efficient, you actually have to deliver it.

Even with this more practical approach to implementation, it still tends to be a point-in-time assessment, or at best an annual exercise in compiling some fairly basic KPIs.

03

They are often BMS-focused

Many of the efficiency gains in green commercial buildings have been achieved via BMS (Building Management Systems), SCADAs (Supervisory control and data acquisition) and/or CAFMs (Computer-Aided Facility Management software).

These are undoubtedly helpful tools to effectively control elements like HVAC systems, that drive much of the energy consumption in a building. However, they tend to be fairly expensive and proprietary systems. Together with the large investments required whenever upgrading the HVAC systems themselves, they have led to a perhaps unjust assumption that ESG is expensive.

04

They monitor indoor air quality monitoring in a limited way

Traditional green buildings already pay some attention to air quality. However, this tends to be implemented in a fairly narrow way, and is often driven by regulatory requirements. Most buildings will monitor temperature and humidity via their BMS, and sometimes CO₂, although this is usually point-in-time rather than real-time measurements.

One of the problems with BMS measurements of air quality parameters is that they are not always particularly accurate. Like any physical equipment, sensors can and will degrade over time.

And the placement of these sensors, often at ceiling level connected to HVAC systems, means that measurements do not always reflect the real experience of occupants. Discrepancies between desk and ceiling level temperatures can be significant enough to cause poor thermal comfort and unnecessary energy wastage.

05

Data is not easily shareable

Despite containing huge amounts of data, BMS are often riddled with poor user interfaces. This makes it difficult for information to be displayed in a way that is useful to multiple stakeholder groups.



What are healthy buildings?

In recent years, there has been an evolution from traditional green buildings to a much broader approach to sustainability that incorporates how buildings affect the people in them.

In simple terms, healthy buildings are those that aim to optimise occupant health and wellbeing as well as minimising their environmental impact.

Arguably the biggest push for the transformation of green buildings into healthy buildings has come from the growing availability and cost efficiency of new technologies like IoT and big data. This has coincided with a large and arguably irreversible change in societal and regulatory attitudes towards wellbeing, undoubtedly accelerated by the COVID-19 pandemic.

Expanding the concept of green buildings with cost-efficient technology

Healthy buildings still make good use of their BMS and efficient HVAC installations, but they also find ways to make the data more accessible and useful.

There's also the option of measuring other data sets depending on the needs of each individual business. Two of the most common applications that expand

the range measurements are occupancy and indoor air quality monitoring.

Real-time occupancy monitoring allows you to track the number of people in a building, floor, room or even whether or not an individual desk is occupied. It has multiple applications, including:

- Ensuring compliance with legal occupation requirements
- Enabling hotdesking and flexible work practices
- Optimising the use of common and collaborative spaces
- Measuring social distancing
- Detecting customer interest across a particular space (e.g. in retail)
- Track and trace of people and equipment (e.g. in a hospital or industrial environment)

Real-time indoor air quality monitoring expands the range of measures typically sampled by the BMS (temperature, humidity, and sometimes CO2) to include a broader spectrum of measurements that have a large impact on both the short-term and long-term health of occupants.

PropTech can enable these and many other applications (real-time energy consumption, vibration detection, access detection, etc.) in a granular and cost-efficient way, and at a small fraction of what a full BMS implementation might cost.



Green buildings vs healthy buildings

Green buildings



Focus on the 'E' in ESG
Efficient design
Sustainable materials
Low energy consumption
BMS-focused
Data used by facility managers
Acceptable ROIs

Healthy buildings



Consider the 'E', 'S' and 'G'
Efficient operation
Real-time data
Good indoor air quality
Occupant-focused
Data used by all stakeholders
High ROIs

How can healthy buildings enhance the 'E' in ESG?

The environmental focus associated with green buildings is certainly not lost when it comes to healthy buildings. If anything, it's expanded with more accurate measurements and tools.

Energy consumption and emissions can not only be measured in real time, but cross-checked with other data for greater insights on optimisation. For example, ventilation and heating can be adjusted in response to real-time occupancy levels, or presence detectors can be used for smart lighting.

Comprehensive indoor air quality monitoring can also spot issues like:

- Incorrectly configured HVACs
- Faulty BMS sensors that are causing excessive energy consumption
- BMS that have not been fine tuned in a while despite actual changes to the physical space e.g. repartitioning of an office

Real-time occupancy monitoring and flexible work practices can also have a substantial environmental impact by reducing energy and water consumption and limiting the pollution from daily commutes. Solutions like smart cleaning can also contribute to a reduction in the use of polluting cleaning products, as well as improving user experience.

Traditional environmental regulations have prioritised design and compliance over operation and effectiveness. This has led to suboptimal results and, as a result, regulatory emphasis is quickly changing towards a more practical, results-oriented approach.

Although current emphasis is shifting towards modelling and simulations, it seems inevitable that regulators will end up demanding operational efficiency. Healthy buildings anticipate this trend by putting the emphasis on rich, real-time IoT data. Machine learning and advanced analytics can also be deployed to gain ever greater environmental efficiencies.



How can healthy buildings enable the 'S' in ESG?

Occupancy and indoor air quality monitoring can also have a significant impact when it comes to the 'S' in ESG.

As we've already discussed, monitoring key indoor air quality parameters in real time can have a profound impact on the health and wellbeing of employees, customers and residents alike. To find out about this in more detail, you can go to page 28.

And the aforementioned benefits of real-time occupancy monitoring include allowing for a more collaborative workplace and a better work-life balance (SDG number 3), which can in turn help with gender equality (SDG number 5). Space management solutions also bring a huge cost saving benefit, so they are a prime example of combining social interest with corporate profit.

In addition to this, PropTech can enable a wide range of other applications with substantial social benefits:

- Tenant experience apps can significantly improve the lifestyle of tenants:
 - Make it easy to book rooms and facilities
 - Provide indoor building navigation
 - Enable tenants to share their experiences
 - Provide access to useful information like canteen menus or available parking spaces

- Automated Legionella monitoring can increase water safety
- Smart fridge monitoring can reduce food and vaccine wastage
- Sensors can help to predict machine failure and improve health and safety



How can healthy buildings enable the 'G' in ESG?

One of the frequent criticisms of ESG is that although it's meant to be practical and measurable, implementation often lacks detail. PropTech removes all of that by providing rich, real-time, traceable and auditable data in a single platform.

And this data can be accessed by different stakeholders in a way that benefits them:

- Facility managers can see instant, real-time information on all variables of interests, for all buildings, enabling more informed decision-making
- Occupants can see real-time indoor air quality for any space they enter on their phones or on displays in the buildings
- Owners, especially those with complex portfolios, can significantly improve the quality of their decision making by having a holistic view of their entire estate across a number of variables
- Corporate directors can provide objective content to the non-financial section of their annual report
- Legal compliance with current and future regulation can be ensured with auditable data



The economic case for ESG in real estate

There is undoubtedly a compelling moral and regulatory case for an ESG approach to owning and managing real estate. However, there's still a common misconception that ESG is expensive.

Both academic research and our own experience shows that ESG actually pays for itself many times over. It can deliver a huge direct return on investment (ROI), and is also one of the best ways to protect against the risk of accelerated obsolescence and regulatory non-compliance in real estate portfolios.

In this section, we explore a few ways in which an ESG focus can substantially improve productivity, operating costs, and financial performance.

The effect of traditional green certifications on values, occupancy and rents

There are various academic studies spanning the last two decades that show the significant impact of green building certifications on value, occupancy and rents.

We've already mentioned that the World Bank Group has made the case for up to 23% higher occupancy rates, 8% higher rental income and 31% higher sale premiums in new construction for traditional green buildings.

This is definitely on the higher end of the academic literature, which has identified value increases ranging between 8% and 25% for new green buildings. However, with ever-increasing social and regulatory sensitivities, the World Bank Group's figures certainly seem reasonable.

A really interesting finding in a study from 2017 is that figures for retrofitted green buildings consistently show a premium of 10-20%. It's clear that ESG benefits are not limited to new builds, and it's remarkably easy to convert existing buildings into smart ones in a matter of days or weeks.



This means that owners of existing stock are likely to be the biggest beneficiaries of PropTech on a relative and absolute basis, as they can switch to the latest technology with reasonable implementation timelines.

The return on investment of space efficiency solutions

From a purely economic point of view, the main benefit of implementing hot desking/flexible working is the associated savings in rental and general desk servicing costs. This is the case even for owner-occupiers, as the surplus space can be rented out or sold.

To calculate the ROI of this proposition, we first calculated the cost of implementing hotdesking in a typical modern open office layout via a state-of-the-art, real-time capacity and occupancy solution (including hardware, software and installation).

We then compared it to the average occupancy cost data from CBRE for various cities across different continents, assuming an allocation of 10m2 per employee including common parts and efficiency gains at the more conservative end of the spectrum.

The results speak for themselves: triple-digit ROIs in every location. For instance, in the typical office in the City of London, every \$100,000 invested in this type of solution can yield about \$3.1million of net savings relative to a traditional one seat per employee.

European locations

Estimated ROI

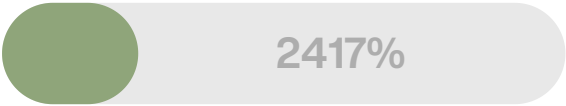
London (West End)



London (City)



Paris

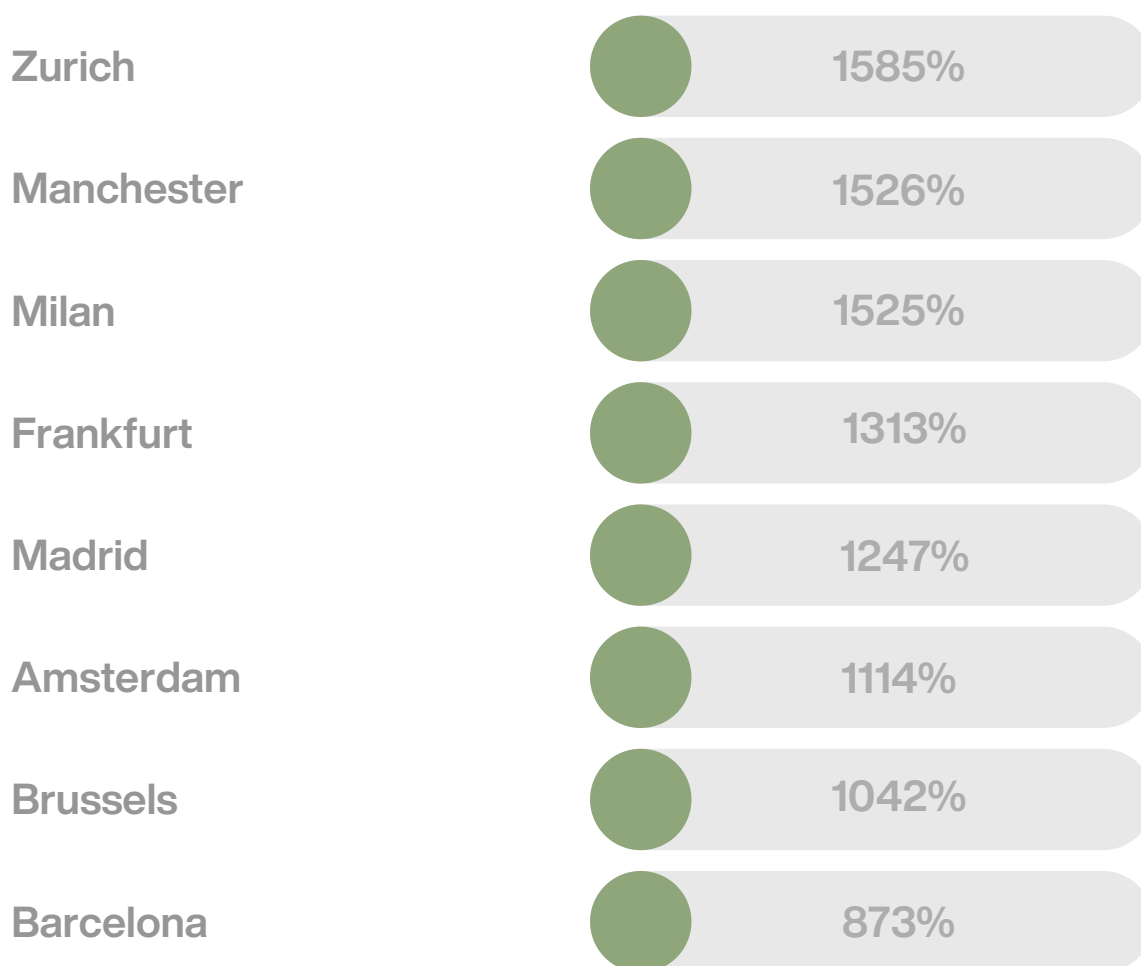


Moscow



Stockholm

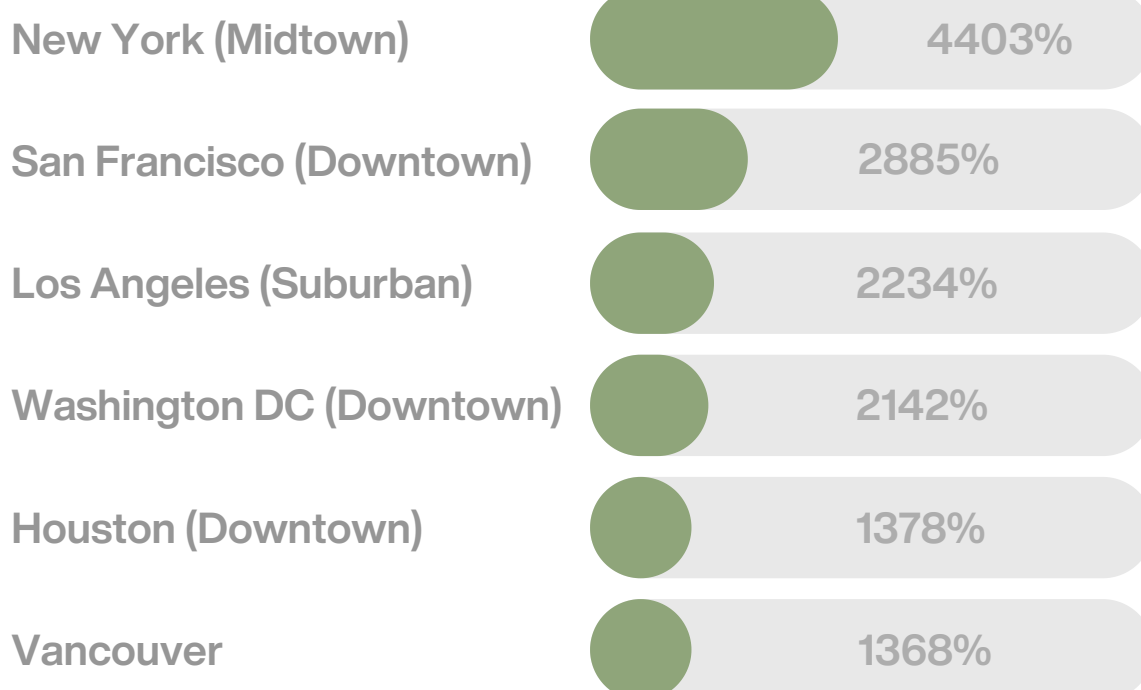


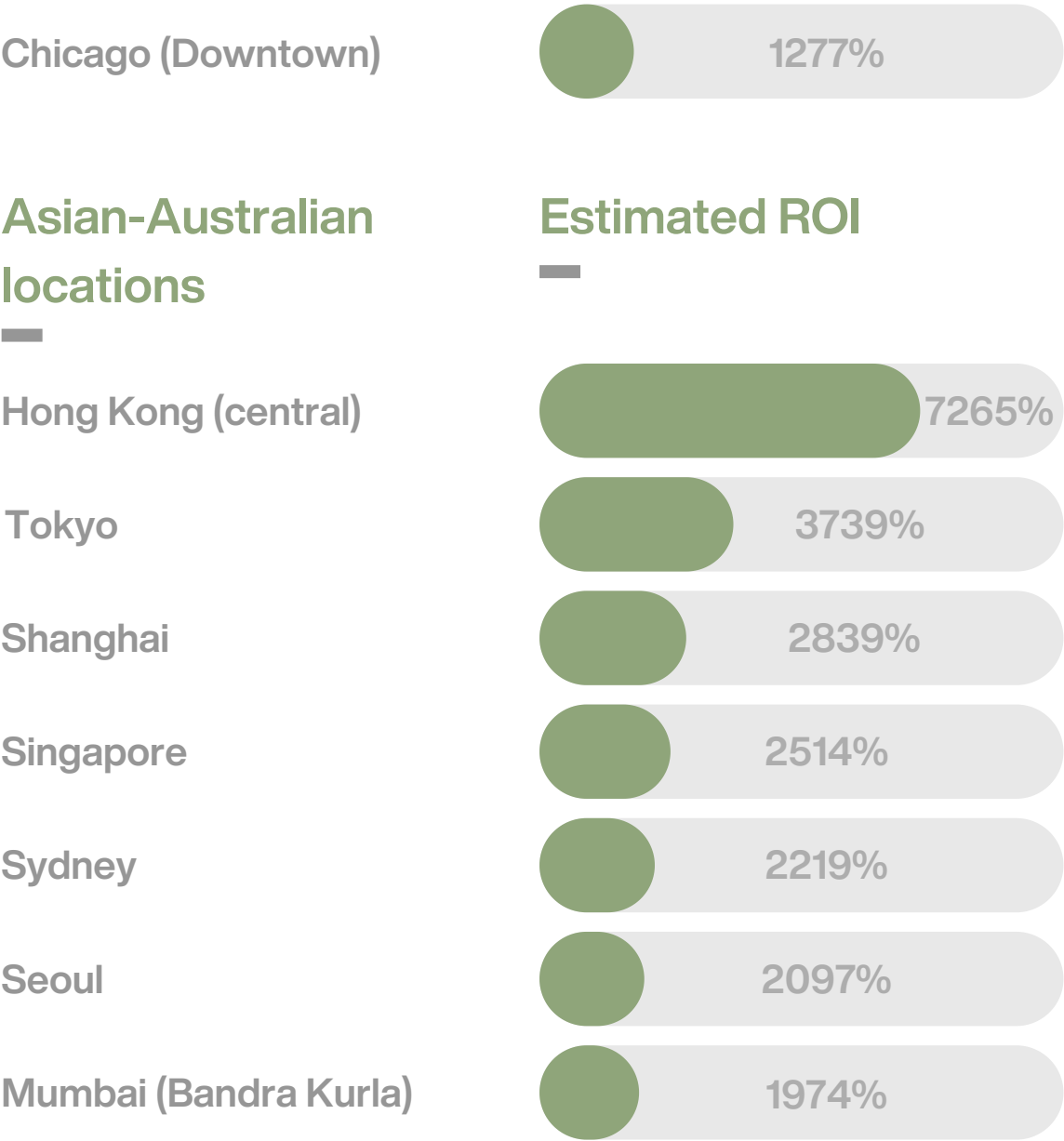


American locations



Estimated ROI





The exact figures will of course vary from building to building, as each implementation is unique. However, it's clear that there's certainly no misalignment between ESG and a company's bottom line, and that there are in fact huge potential savings available.



The economic benefits of optimal indoor air quality

Besides rental costs, the other greatest cost for companies tends to be wages. This is where optimal indoor air quality comes into its own, as it can lead to significant increases in employee productivity.


While productivity gains can be slightly more difficult to quantify, there is an abundance of scientific literature showing how different environmental variables impact both cognitive abilities and productivity. And these can be used to make an educated guess on the ROI of indoor air quality monitoring.

Studies have shown that when temperatures fall out of the ideal range of 20-24°C, productivity losses occur at a rate of 2% per degree. Elevated levels of CO2 have also been shown to cause an 11% reduction in productivity and 23% impairment in decision making.

Having an accurate, real-time and comprehensive air quality monitoring system that reflects the real experience of occupants can help to manage fluctuations more effectively. Even minor contributions, like preventing employees from being in suboptimal conditions for 5% of their time, can lead to triple-digit ROIs (assuming a 5% increase in productivity, £30k salary and disregarding absenteeism due to Sick Building Syndrome). Obviously, the older the buildings, the greater the gains as their BMS will be less efficient to start with.

What is abundantly clear is that even with fairly modest predictions, PropTech solutions can quickly and effectively make a huge impact on a company's bottom line.



A large, white, stylized letter 'E' that serves as a background element for the 'E' section. It is composed of several horizontal bars of varying lengths, creating a modern, geometric look.

The 'E' in ESG is all about a company's influence on the environment and its ability to mitigate any risks that could potentially harm our planet. And the impact a company has doesn't have to be direct, it includes their supply chains too.

The 'S' in ESG considers how a company manages relationships with its workforce, and the society and political environment it operates in. Investing in companies that pay attention to these social issues can enable investors to reflect their own values, and lead to higher and more reliable returns.

A large, white, stylized letter 'S' that serves as a background element for the 'S' section. It is a smooth, continuous curve, resembling a thick, white ribbon or a modern font style.A large, white, stylized letter 'G' that serves as a background element for the 'G' section. It is a bold, modern font style with a thick stroke and a clean, geometric design.

The 'G' in ESG is about understanding governance risks and opportunities. These constantly change as social, political, and cultural attitudes continue to evolve. Considering governance risks is critical, as poor governance practices have been at the heart of some of the biggest corporate scandals.

A board perspective: strategy and non-financial reporting

ESG: a board revolution

The unstoppable ESG movement has reached the core of the corporate world. As we've discussed, there's been a drastic evolution from a capitalism close to Friedman's famous 1970 essay on profit maximization, to a stakeholder capitalism with a focus on long-term value creation.

A clear and compelling mission needs to be at the heart of every company's efforts to enhance its positive impacts on the environment and on society. And the ultimate responsibility for defining that purpose must rest with the board.

ESG governance is clearly becoming an established imperative for boards, and their role now includes:

- Going beyond ESG risk mitigation to value creation
- Being proactive not reactive
- Considering stakeholders in decision-making
- Keeping on top of regulatory ESG governance trends
- Prioritising the 'S' in ESG

Susana Quintás, Senior Advisor for Metrikus Spain, explains that ESG governance is now firmly entrenched as a board's fiduciary responsibility:

“It is not merely a change of rhetoric. It is a true board revolution. And it is the board, by definition, who is the driving force behind a company's strategy and, as such, has a lot to say about ESG.”

The World Economic Forum: measuring stakeholder capitalism

Last September, the World Economic Forum (WEF) drew up its version of a curated list of ESG goals, to encourage businesses to inform stakeholders of non-financial contributions.

The WEF went through a six-month consultation process with 200 companies and investors, to create a set of universal metrics, in line with the United Nations' Sustainable Development Goals.

There are 21 core stakeholder capitalism metrics, and 34 expanded ones, all under four main pillars:

- Planet
- People
- Prosperity
- Governance

In January this year, at the annual Davos gathering, more than 60 global companies announced they've signed onto a commitment to follow this common set of ESG goals.

This is certainly a big step in the right direction, and a clear demonstration that many CEOs and boards are supportive of making non-financial reporting just as rigorous as financial reporting.

- [Read the full WEF report here](#)

The Institute of Directors-Administrators (IC-A)

The well-known expert on boards, the Institute of Directors-Administrators (IC-A), recently published a paper about the implications of sustainability and non-financial information for the boards of directors. Their work shows the profound impact that sustainability issues are beginning to have on boards.

The IC-A highlights the importance of the board leading an authentic cultural change in the company. They also discuss how vital it is for boards to have a clear understanding of the stakeholders, new policies, and any criteria or metrics that need to be established.



The Spanish Institute identifies four areas of impact on the board level.

1. The board's own management
2. The definition of corporate strategy
3. Accountability
4. Overseeing both the management of the company and the executive team

They also discuss some key points for boards to consider.

- Strengthening the capabilities of the board team with a mixture of talent that combines different experiences/expertise and extends to these new areas
- Creating a 'Sustainability Committee' to advise or submit proposals related to ESG to the board. Depending on the nature of the company, ESG functions can be distributed among previously existing committees like the audit committee.
- Changing the agenda to give ESG issues the relevance they require in all their breadth and complexity
- Promoting changes in aspirations, criteria, policies, codes of conduct and information system
- Ensuring the evaluation of the board, its committees, its president and its CEO is expanded to include ESG metrics (qualitative or quantitative)
- Striking the right balance between transparency and confidentiality when it comes to the creation of the strategy

The IC-A concludes its comprehensive analysis by highlighting the fact that incorporating new requirements into the basic functions of the board represents an exciting opportunity. This goes well beyond the mere application from a regulatory compliance perspective.

As companies continue to navigate this landscape, they will be called upon to provide even greater transparency in response to demands from stakeholder groups, including investors, customers, policy makers and regulators, and employees.

Susana Quintás spoke to us about the importance of high quality ESG information:

“There is a need to gain traction in sustainability information, setting key performance indicators, so that it increasingly approaches, both in quantity and quality, to the usual information seen in the reports of a financial nature. It is necessary that the information be consistent, clear, comparable, auditable and reliable and, above all, it is urgent to create a global standard that allows comparison between companies and sectors in a homogeneous way.”

The surge in ESG reporting is only just beginning. And as the market continues to create new disclosure standards and methods, the board's accountability and opportunity in this area will only increase.



ESG case studies

Increased public scrutiny and tighter regulations mean the impact of an ESG controversy on a company's share price can be pretty huge. We've picked out two well-known scandals that have happened in recent times and explored their impact.

We have also taken a look at the flip side of the coin, and chosen some companies that are using PropTech to lead the way when it comes to sustainability.

BP: an ESG catastrophe

On 20th April, 2010, an explosion at the BP Deepwater Horizon oil rig released over 130 million gallons of crude oil into the Gulf of Mexico. It was the biggest oil spill ever in U.S. waters, and it remains one of the worst environmental disasters in history.

Eleven rig workers lost their lives, and so did millions of marine mammals, sea turtles, birds, and fish. [This article](#) explores the long-term environmental impacts of the spill that can still be felt over 10 years later.

Following the disaster, BP's share price halved, taking four years to recover to its pre-disaster value. What's really interesting is that low ESG scores actually foretold trouble for some investors, and quite a few were able to avoid significant losses by including ESG factors in their financial analysis.

It goes without saying that a poor score can't predict a disaster, but it can definitely indicate the likelihood of one happening. A handful of top investment managers saw the potential holes in BP's reputation and dumped their stock early on, saving their investors millions in avoided losses.

When Lord John Browne stepped down as BP's chief in 2007, [Generation Investment Management](#) interviewed new CEO, Tony Hayward. They found that Hayward did not share Lord Browne's vision for a cleaner energy future, and they sold BP from their portfolio.

[Walden Asset Management](#) also flagged BP's risky behavior early on. In the lead up to the 2010 disaster, there were several accidents that called the company's risk



management into question. A 2005 explosion at a Texas City refinery killed 15 employees and injured 170 more. And an investigation into a leak in its pipeline in Prudhoe Bay Alaska revealed that BP had neglected the pipeline for years.

Walden made the assessment that BP's management was insufficiently addressing key ESG risks. They sold their stock before the disaster, saving their investors from huge losses.

It's clear that ESG analysis can be an incredibly valuable way to assess how well a company is managing risks. It's logical that companies with top management teams are likely to outperform others. And ESG investors have demonstrated a competitive advantage in determining who will be successful in the long-term.

Volkswagen: the emissions scandal

In September 2015, Volkswagen (VW) came under fire after admitting defective devices were installed on 11 million vehicles to cheat on emissions tests. This infamous scandal led to CEO Martin Winterkom's resignation, and raised serious questions about the company's product management practices.

Following 'diesel dupe', VW's share price halved, taking two and a half years to achieve any meaningful recovery.

Unlike the BP oil spill, the VW emissions scandal actually took many environmental investors by surprise, with the company deemed best-in-class according to some ESG data providers. In fact, RobecoSAM, which compiles the Dow Jones Sustainability Index, chose them as car industry group leader in the lead up to the scandal.

The main issue was that VW had a very split ESG rating: good in 'E' and 'S', but poor in 'G'. And it was the governance factors at play that could have provided an early warning.

The incident clearly highlights the value of considering governance issues in the investment decision-making process, but it also shows the potential dangers of focusing too heavily on specific parts of ESG.

Gerold Permoser, chief investment officer and head of responsible investments at Erste Asset Management commented, "We put too much weight on the good points, such as the social and environmental sectors where VW was very good. We didn't put enough weight on governance."



Some people on the advisory board were undoubtedly committed to sustainability and took it seriously. However, there was an inconsistency between this and the board's business goals. There was a clear desire to be the world-leading auto manufacturer by 2018, and the pressure that came from this could have had a part to play in the deceit.

It's apparent that you can have seemingly great practices on the surface, but this doesn't mean that a culture of sustainable development is properly lived by the key players at the company. And just because the data looks good, it can't stop there. Sometimes it's necessary to make a judgement call beyond the data in order to understand what's really going on at a company.

Hermes Investment Management was able to get out of VW in August, just before the truth came out. Lewis Grant, senior portfolio manager at the firm explained, "We aren't just looking for companies to have good governance. We favour companies that are getting better. At VW, we saw governance scores fall from the mid-70s to the mid-60s."

Some investors who were focused on governance issues were able to see that things weren't all as they seemed, and it's evident that this needs to be a consideration when assessing companies.

If there's one lesson to be learned, it's that governance can't be overlooked when it comes to ESG.

PropTech: driving sustainability in the built environment

We all know that PropTech has huge potential to make our buildings more sustainable. To show what is possible, we've picked three offices in London that are leading the way when it comes to sustainability.

These forward-looking spaces are using new technologies to improve energy efficiency and enhance employee experience.



1. Bloomberg's European HQ

Having achieved a 98.5% BREEAM sustainability rating, [Bloomberg's HQ](#) is the diamond standard for eco-friendly working spaces.

The building incorporates an innovative smart ceiling that uses 40% less energy on lighting, as well as improving the efficiency of heating and cooling features. The architecture is optimised to channel natural airflow through the building's ventilation system, potentially saving a whopping 600-750 MWh of power each year.

Water conservation is another important factor in Bloomberg's eco success. An on-site water treatment plant, recycled water systems, and vacuum-flush toilets help the building perform at 70% more water-efficiency than a normal office building.

The outside of the building is also fitted with custom bronze blades. When the outside air is temperate, the HVAC system can be switched off and the blades come into action. They not only cool and shade the building, but have an important role to play in reducing energy consumption.



2. PwC, 7 More London

Home to PwC, 7 More London is one of the sustainability stalwarts and was the first building in London to achieve BREEAM Outstanding status.

During construction, PwC ensured that they would produce significantly fewer carbon emissions than the building regulations required. They ended up working with two solutions: solar heating and trigeneration running on recycled biofuel.

The entire space encourages sustainable behaviour – the car park was replaced with showers and bicycle storage, while plentiful audio and video facilities allow for digital conferencing and less travel.

The whole building is fuelled on recycled biodiesel, with waste cooking oil collected, filtered and refined locally and used to heat, light and run the building. This not only saves waste, but also reduces emissions of harmful particulates, sulphur dioxide and carbon into the city air.

There is also a clear consideration for the local wildlife, with 1,300 square metres of ecological space, home to threatened and protected species of bugs and birds.



3. Brunel Building

Right from the start, the Brunel Building had a focus on sustainability. Many building materials were made from other recycled materials and in turn more than 98% of construction waste was recycled.

Making great use of two 180m-deep boreholes and stable ground temperatures, an aquifer thermal energy storage system keeps the temperature in the building regulated and ensures low carbon emissions. Other features like low energy fan coil units and exposed concrete soffits improve tenant comfort and continue to keep energy consumption low.

The Brunel Building boasts very impressive credentials, with a BREEAM Excellent rating, a WiredScore Platinum rating and a LEED Gold rating.



4. Paramit Factory

The Paramit Factory in Malaysia is certainly a slightly more unconventional space, often referred to as 'the factory in the forest'.

Sustainability was an integral part of the design process, which has enabled an impressive 45% reduction in energy savings when compared to the old factory.

One of the many striking features of the space is its canopy louvre roof, designed to shield against the hot, glary and unwanted tropical sun, while allowing soft natural daylight to filter into the building. Dimmable daylight responsive LED lighting and individual task lighting ensure that the optimal light levels are maintained at all times.

To alleviate the flooding risk from the tropical rainstorms, the building has a 800m³ stormwater retention tank as well as a 400m³ rainwater harvesting tank, which will save an estimated 11,000m³ of potable water a year.

How can companies get started with sustainability?

These are all really impressive spaces that go above and beyond when it comes to being as smart and environmentally friendly as possible.

But the truth is that sustainable offices really don't need to be as complex as this and their impact can go far beyond helping the planet. All you need is a building that collects and utilises data from a system of sensors and devices. And if all these systems can talk to each other, you can realise huge efficiency gains.

Going forwards, offices need to take any steps they can to become smarter and more sustainable. It's better for companies, better for employee health, and better for the environment.

We've also put together some very basic tips that can help to make your company more environmentally-friendly right away.

01

Use eco-friendly products

Let's start with the basics: when you're buying products, make the swap to eco-friendly alternatives where possible. Avoid options involving excessive packaging and always opt for reusable rather than disposable versions.

It's also important to make sure your workplace is cleaned using eco-friendly products. From single-use disposable wipes to solutions containing hazardous chemicals, cleaning products can have a devastating impact on the environment and on human health. To reduce the impact, invest in more natural options or hire a cleaning firm with sustainable credentials.

02

Be mindful with electronics

A good place to start is using laptops instead of computers as they use less energy. It goes without saying that suddenly swapping all desktops for laptops isn't particularly eco-friendly, so just make the change when it's logical to do so. And if your unwanted equipment is still in good working order, it's a great idea to donate it to nearby schools, libraries, charities or other organisations.

It's also key to turn off electronics when they're not in use and to switch to hibernation mode if you go away for a longer period of time. Whatever happens, make sure you turn everything off at night as leaving devices switched on drains a huge amount of electricity.



03

Reduce your energy consumption and use renewable energy

Reducing your energy bill can be as simple as turning off lights when you're not in a room. You should always use energy-efficient bulbs as this is a small change that can have a big impact.

As we've mentioned, the most effective way to monitor and reduce your energy consumption is by using a smart buildings platform, as this gives you complete oversight and control. It's also a good idea to opt for a renewable energy provider to reduce your impact even further.

04

Ensure good waste management and keep transport in mind

Make it easy to recycle by placing recycling and food waste bins in accessible places, giving employees the chance to dispose of their waste responsibly. It's also a good idea to remove individual bins from under desks, as this requires more bin bags which will end up in landfill further down the line.

Where possible, choose a site with convenient transport options. Encouraging walking, both within the workplace, as well as for travelling to and from work, brings significant benefits for employees and the environment. You can also implement a cycle to work scheme, and ensure access to safe, secure and convenient cycle parking facilities.

05

Improve your indoor air quality

Improving your indoor air quality is an easy way to optimise employee health, wellbeing and productivity.

To create a healthier environment, you need to ensure optimal humidity and adequate ventilation so that employees have access to fresh, clean air. It is also important to control any indoor sources of pollution and clean regularly and with the right products. Installing sensors is a very effective way to understand and optimise your indoor air quality immediately.



06

Consider whether implementing flexible work practices might be an option for you

It's not necessarily the right solution for every company, given that not all work practices lend themselves to remote work. But when they do, making a better use of space can lead to a lower environmental footprint, better lifestyles for employees, and more sustainable cities and communities.

07

Make sustainability goals

Our final sustainability tip is to tackle your green initiatives strategically and set ambitious but achievable goals. Doing this will give you something to aim for and increase the chance of you achieving them.

Combine these simple steps with some smart technology, and you'll be on your way to achieving a much more sustainable workplace.



ESG interviews

As part of our research for this guide, we interviewed some key industry players to get some different perspectives on ESG.

They shared some really interesting thoughts, so we've included the following full interviews for you here:

- Alex Edds, Director of Innovation at JLL
- Nick Robinson, Founder of NJRobinson Consulting and Co-Founder of SynerG
- Edward Rowland, Credit Risk Manager for a Social Lender and Environmental Data Expert



Alex Edds, Director of Innovation at JLL

What are some of the key challenges with PropTech adoption?

There is so much great technology available to us, but when it comes to implementing PropTech solutions, it is often the commercial realities that pose the real challenge. With commercial buildings, it is important to remember that there is a whole supply chain of people, from landlords and building owners, to facilities management and cleaning staff.

This means that the ownership and running of buildings is often fragmented, with owners rarely responsible for the day-to-day management of the space. There are lots of questions we need to be asking: who is paying for the technology, who is installing it, who is using it, and who is benefiting from it?

From a landlord's perspective, it is key that smart technology is presented in a clear way, commercialised, and actually used. When it comes to tenants, it is completely dependent upon the lease and type of building. You might have one tenant or you might have 20, which makes it a complex market to sell to. To make things more challenging, tenants coming into a building may already have their own solution.

It is clear that technology is only one part of the puzzle, and there's a whole range of commercial realities and conversations that need to work around this.

"Technology is only one part of the puzzle"

How can we overcome these challenges?

To overcome these challenges, the market simply needs to become smarter. There must be a more careful consideration of the supply chain, clearer communication about sharing data, and more collaboration between landlords and tenants.

It is really important to find a commercial model that enables both the costs and benefits of smart technology to be shared fairly. The ultimate aim is for the building as a whole to drive efficiency for all parties.

In terms of the technology itself, it is essential that it is easy to use. Integration and interoperability are absolutely key, as any new solutions need to be able to work alongside any legacy systems. If the technologies in a space can talk to each other effectively, this will help building owners and users to be in complete harmony with each other.

Another thing I think we need to work on is data visualisation.



There is definitely more to be done when it comes to displaying information in a clear and digestible way. We need to get to a point where all parties can understand at a glance how a building is performing in real time.

How can we mitigate concerns about tech becoming obsolete?

Due to the speed of technological advancement, there is still a great deal of reticence from landlords about implementing technology they fear might become obsolete in a few years' time.

To overcome this, I think that the tech industry needs to do a better job of selling itself. There needs to be a stronger message coming from tech companies: we are all going in the same direction and tech will undoubtedly advance, but you are safe with us.

It also goes without saying that there also needs to be a huge focus on flexibility within the technology itself. It is vital for landlords to know that steps are being taken to elongate not just the life of IoT, but the life of the investment.

How has COVID-19 changed attitudes towards health and wellbeing?

Wellbeing as a general theme was growing in importance for both landlords and tenants pre-COVID, but the pandemic has really accelerated this. There is an important piece around indoor air quality and cleanliness, as well as a growing focus on mental health.

The 'S' in the ESG has certainly become far more prominent and I think that this will continue. There are more and more things coming to market to help the industry

navigate the space, including new building standards, and an increase in real-time air quality monitoring. Technology has a hugely important role to play in improving data transparency and bringing conversations about health and wellbeing to the forefront.

In general, there is much more awareness about the dangers of air pollution both indoors and outdoors. It won't be long before sensors are embedded within our phones and we can use this to avoid polluted areas or routes. We could easily get to a point where employees arrive at work and can see that the air quality in the office is actually worse than that outdoors. This a potential litigation volcano waiting to erupt, so there are definitely some challenges ahead.

If they haven't already, it's clear that landlords need to be taking steps to measure the health of their buildings. Once you can measure something, you can manage it. We are only just starting to see the beginnings of that evolution, and going forwards I truly believe that increased data transparency will make us rethink everything.

"Increased data transparency will make us rethink everything"



Nick Robinson, Founder of NJRobinson Consulting and Co-Founder of SynerG

What is the biggest challenge you have seen when it comes to ESG?

I think that the biggest challenge is to create something that people can buy into personally, that is also commercially viable. We can always appeal to the empathetic side of human nature but that can only go so far. For something to be adopted and make material change, it has to be a commercial proposition.

Another big challenge is getting people within a company to fully support their ESG agenda. To achieve this, you need great internal communication and to set realistic timescales and specific goals. I think that the best way to get started with ESG is to begin with something that is very commercial and simple, and build on that. It's all about creating a stepping stone to get the support you need to move onto the next phase.

How can PropTech help companies to reduce their energy usage?

Most organisations are not aware of their usage and emissions at a granular level. Understanding is typically at a high level and very much broad-brush. The fact of the matter is: you can only save or reduce if you know what you produce and where you produce it.

Smart technology gives companies the detail they need to understand and improve efficiency. When it comes to reducing energy consumption, the best option is to measure at a granular level, and bring in a

"The best way to get started with ESG is to begin with something that is very commercial and simple"

range of data sources from weather patterns to occupancy levels. This is often overlooked, but these sources can have a decisive impact on your usage.

When you have the right data, you can see what you've achieved and decide what to do next to become more sustainable.

How can PropTech help to make our buildings more sustainable?

PropTech enables a unique level of control of your buildings that allows you to reduce consumption, improve worker experience, reduce travel, and many many more benefits.

These benefits generally fall into three distinct areas:

- Employee productivity and engagement
- CO2 production, consumption of gas, electricity and water and waste.
- Operational excellence to drive efficiencies (e.g. proactive monitoring, first time fix etc).



None of this can be done without a granular view. I'm honestly surprised more people aren't using technology to make things smarter and more efficient. It's a win-win situation: help the planet, save some money, and grow your revenue.

How have you seen IoT technology help your client

Our client has a very comprehensive strategy that covers all aspects of ESG. We have been working with them to implement IoT technology to minimise their environmental impact of their buildings, reduce spend on utilities and improve their operational efficiency to proactively manage their estate.

In our work, we have conservatively targeted the following outcomes :

- 20% reduction in CO2 emissions from their buildings
- 20% reduction in energy costs
- 18% reduction in engineer call-outs

And these are very realistic numbers for any company to achieve with the implementation of IoT technology.

How can offices become more sustainable post-covid?

Following the COVID-19 pandemic, flexible working is clearly going to become more prevalent, which means that companies need to manage their offices more proactively and in line with real time usage. Energy usage needs to be based on occupancy levels, and smart technology is the only way to achieve this.

Companies can't use a broad-brush approach to design their office of the future. Each organization is unique in its working

culture, flexible working policies, workforce and products and services. Real-time data is needed to understand how spaces are being used in this context and define a realistic and accurate path towards making them more sustainable.

**"Companies can't use
a broad-brush
approach to design
their office of the
future"**

Edward Rowland, Credit Risk Manager for a Social Lender and Environmental Data Expert

When and how did ESG become prevalent?

ESG modelling is well embedded within financial reporting and has been thrown into mainstream headlines over the last 3 years, due to increasing ethical awareness. Put simply it 'proves environmental, social and governance credentials to build sustainable business relationships'.

Its acceleration will continue throughout 2021 and for the rest of the decade, COP26 will stimulate further interest as well as initiatives such as the Green Bond and National Infrastructure Bank recently announced by the government.

How can ESG factors add financial value?

With the right focus relationships will flourish, investment opportunities will grow where businesses can prove sustainability and balance ethically aware activities alongside profitable business practices.

Ongoing sustainability will gain more attention across the market and future investment can come at a cheaper price, increasing profit.

Visibility of this success through data and reporting will further stimulate business activity. Interesting developments within technology, data and its capture will assist with the breadth of information used within this process.

What are some of the barriers to ESG?

ESG shouldn't be overtaken by pure net-

"ESG modelling is well embedded within financial reporting"

zero ambitions, although this is becoming a driving force. Assessments need to cover a broad set of environmental, social and ethical components, not forgetting diversity in the workplace, health and safety and strong governance, with business stakeholders being given the opportunity to vote on important issues.

This is where regulators need to allow enough guidance and flexibility for fund managers to deliver effective investment and associated reporting.

How can IoT help with data collection?

IoT brings connected devices, greater streamlined data and visual representations, including risks and their mitigation.

Climate risk within ESG doesn't have to be complicated credit risk models, IoT can capture a wealth of data and summarise its meaning in various forms, this can cover a spectrum of dashboards and also feed itself into more rigorous ESG models where appropriate.



Will the rise in ESG lending continue?

Now is the time to act, not only to grow ESG lending, but to harness it for an economic recovery. A strong focus on climate issues will strengthen the environmental component of ESG, similar focus on social ethics and governance will allow credit risk models to be fully calibrated with sustainability.

Increased awareness will boost the requirement for organisations to employ a 'Chief Sustainability Officer', to work alongside the Financial Reporting team.

What impact has COVID-19 had on ESG?

Covid has made the world more aware of health and governance issues. Climate control is interwoven within this social mission, making the environmental aspect of ESG everyday news.

Governments as well as businesses are now accountable for positive climate outcomes building momentum for a green economic outlook. This shared spirit means all aspects of ESG are here to stay, just for many the terminology will be new.

What is the future of ESG?

The fundamentals of ESG will remain the same, with increased attention comes opportunity and this should be embraced.

"Covid has made the world more aware of health and governance issues"

The future of ESG

Will the rise of ESG investing continue?

The simple answer to this is yes. ESG issues are becoming an increasing priority across the world, and regulation is constantly encouraging companies to become more sustainable.

These regulations and requirements, along with increasing investor demands, will undoubtedly encourage companies to focus on improving their ESG rating. As time goes by, less sustainable companies could start to struggle to find investment opportunities.

Some might argue that ESG is just a fad. But the factors that have driven the movement are only becoming more significant as time goes on:

- Technology and the rise of transparency are here to stay
- Gathering and processing data will become even easier and cheaper
- Smart algorithms will allow for better interpretation of non-traditional financial information
- Good stewardship and low carbon practices are more important than ever

And as we've explored throughout this guide, IoT and PropTech have the potential not only to help with ESG factors, but to make the collection and reporting of ESG metrics way more streamlined.

What is the future of ESG?

ESG remains a complex space, plagued with issues like greenwashing and inconsistent reporting, but it's clear that things are heading in the right direction.

Progress is being made towards a global standard for ESG reporting and industry sectors are starting to coalesce around their preferred frameworks.

Going forwards, collaboration and cooperation across key parties, industries and regions will be pivotal in helping us move towards more reliable, consistent and comparable disclosure requirements.



ESG investing offers individuals the opportunity to vote with their money and make a positive impact. And it has matured to the point where it can accelerate market transformation for the better.

Gema Esteban, Global Head of ESG at IG4Capital Esteban spoke to us about the need for us to incorporate ESG factors into all aspects of our lives:

“ESG, and technology are linked to a company’s core business and therefore to its P&L, its valuation and its impact on society. But we still need to work very hard in order to ensure that the focus on ESG is given even greater priority in order to really make a global impact. It is time to rethink how we consume, how we behave, how we manage our companies, and what legacy we want to leave for the future.”

Environmental, social and governance factors can shape not just the future of investing, but the future of our world.



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Get in touch

If you have any feedback or questions about this report or about ESG in general, we'd love to hear from you.

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