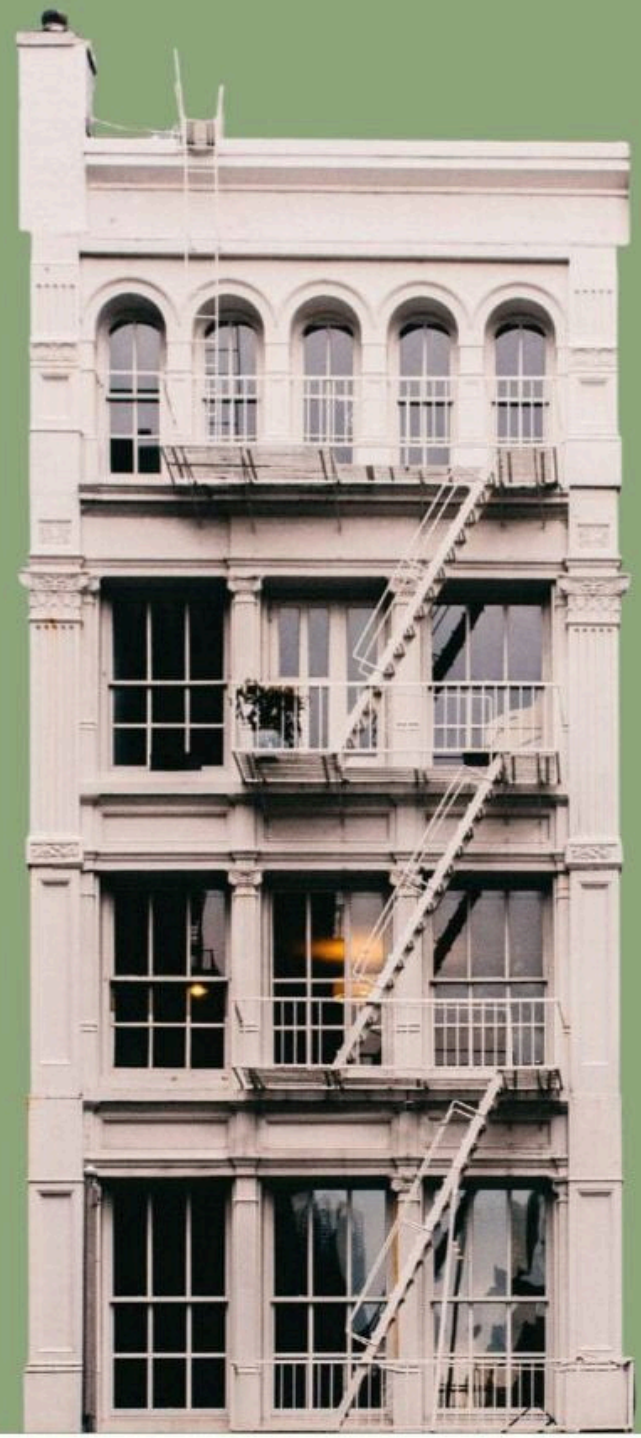
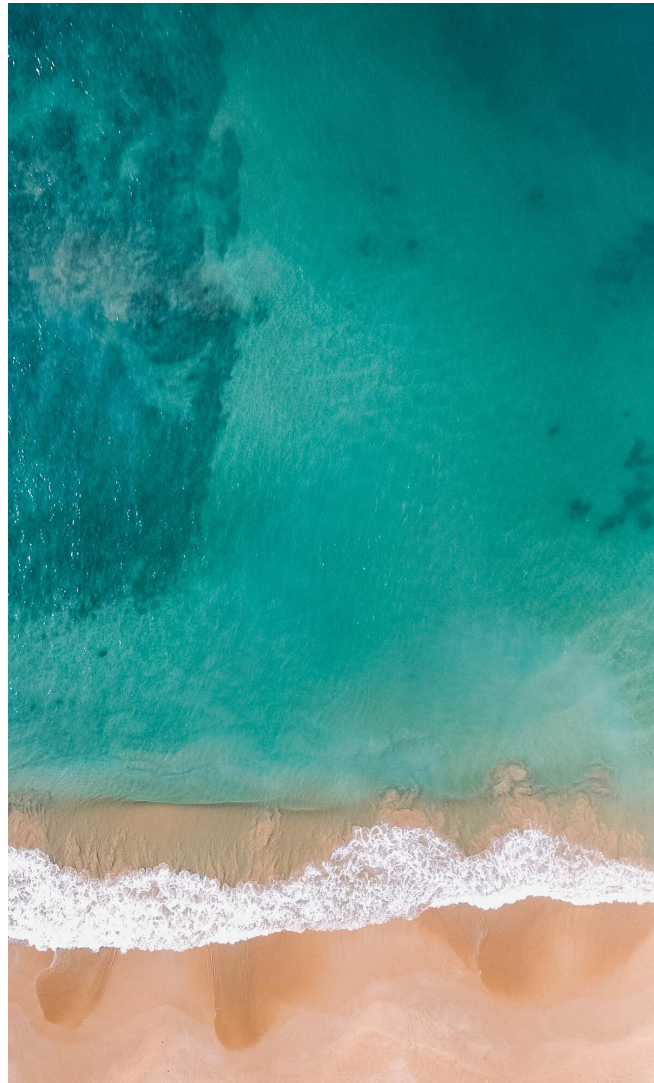


**How bad are
buildings?**



A note from our CEO, Gary Cottle





It's safe to say that the era of ESG has finally arrived – 2021 was a record year for ESG, with an estimated \$120 billion pouring into sustainable investments, having increased more than tenfold in the last few years.

Looking back to when I first started my career, Corporate Social Responsibility (CSR) – the frontrunner for the 'S' and 'G' of ESG – has migrated from a nice-to-have to a must-have, to what ultimately is now industry standards, legislation and a global framework.

Today, as we deal with the consequences of the first real energy crisis in nearly 50 years and focus more than ever on the climate crisis, sustainability means everything to everyone. We are very much in the must-have stage, where every company and investor needs to demonstrate their ESG commitment and credentials to a healthier, lower carbon future within the context of a better run – and fairer – organization.

However, as with CSR, the real challenge as we migrate from 'talking' about ESG to 'doing' ESG will be that it requires data to demonstrate compliance and progress.

That is why I feel so strongly about what we do at Metrikus. Our ESG solution is driven by data and leaves no room for greenwashing or grand gestures – we prove how a space is performing and provide insights to increase efficiency.

We've put this whitepaper together to reflect on how ESG has grown to date, explore the current state of play, and consider what is next for this ever-changing topic.

If you have any questions about this whitepaper 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,

Gary Cottle



ESG: the history and evolution

What is ESG?

ESG stands for environmental, social and governance criteria, and it's pivotal to the way today's businesses operate. It's all about measuring a company's impact on society, the environment, and how transparent and accountable it is.

E: environmental criteria is 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



Over the past couple of decades, ESG has evolved rapidly, moving from the sidelines to the forefront of decision-making.

And according to Bloomberg Intelligence, global ESG assets are likely to surpass a massive [\\$50 trillion by 2025](#).

In recent years, ESG investing has extended beyond financial investments and into real estate.

ESG and buildings

It's clear that real estate is going to be one of the asset classes where the contrast between ESG winners and losers will be the starkest, as ESG is a measure of both impact and risk. 'Brown' assets and

The appetite for tracking and prioritizing ESG factors in buildings has exploded, and there are several reasons why:

- The climate crisis and the risks associated with it have driven investment in sustainable buildings
- Regulators working to address this problem are enacting stricter policies and standards
- Investors looking to make sound business decisions are increasingly looking for transparency and stakeholder engagement

portfolios risk becoming obsolete, while 'green' assets will continue to increase in value.

PropTech and IoT can 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 investors, landlords and facility managers who start future-proofing their portfolios now will create solid foundations to sustain long-term value in a rapidly changing world.



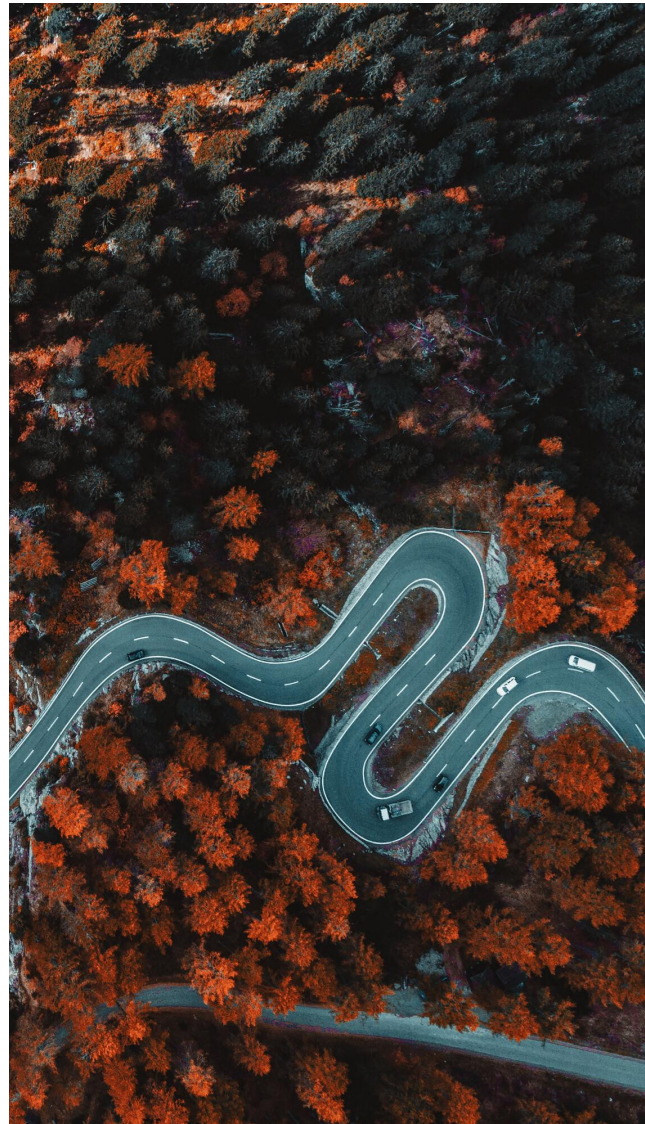
ESG: a timeline

Let's take a look at some of the key milestones that have culminated in our understanding of ESG today.

2004 Former UN Secretary, General Kofi Annan, wrote to over 50 CEOs of major financial institutions, inviting them to take part in a joint initiative to find new ways to integrate ESG into capital markets.

2005 The initiative produced a report called *Who Cares Wins* by Ivo Knoepfel, which 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.



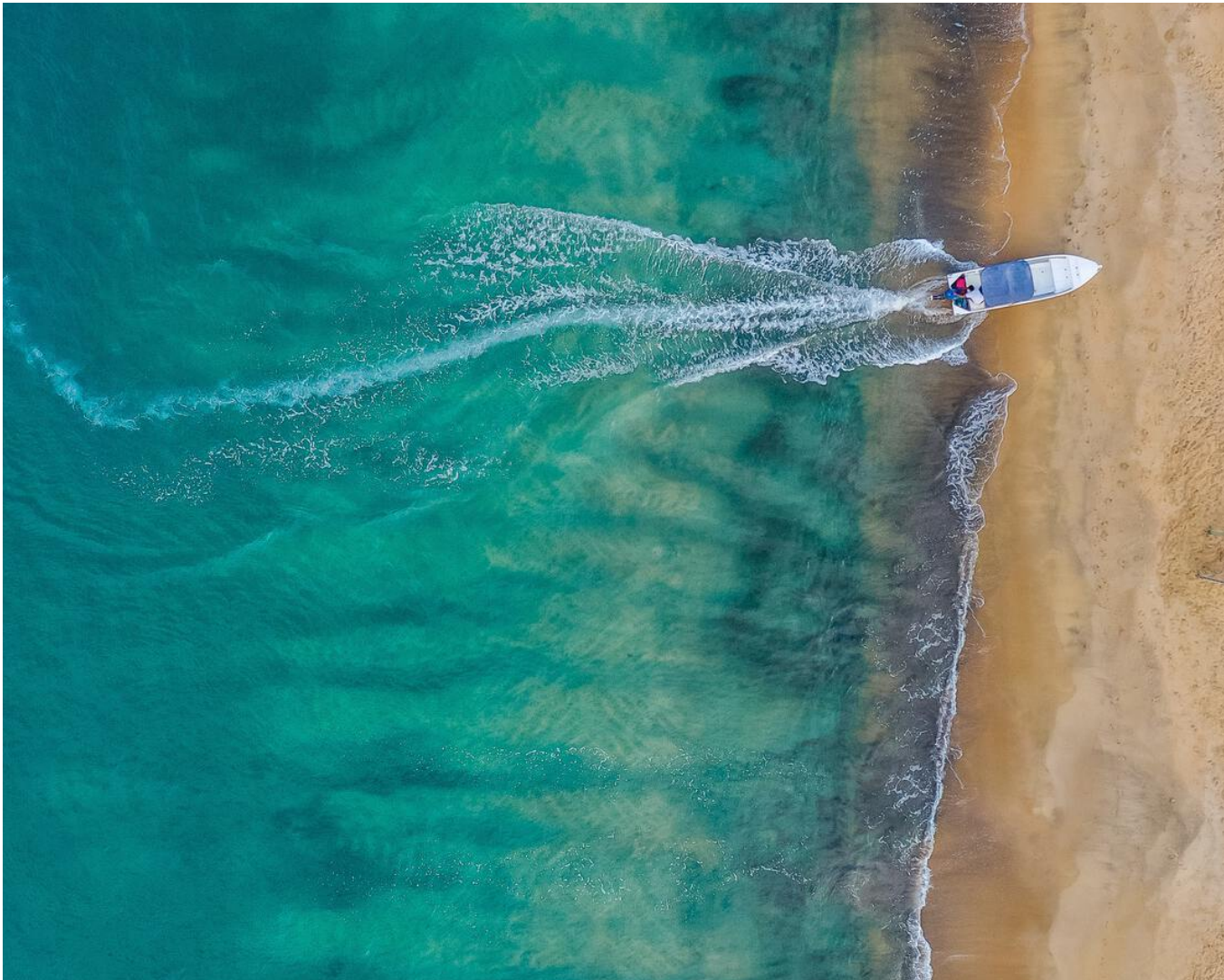
2006 These two reports formed the backbone of the launch of the [Principles for Responsible Investment \(PRI\)](#) at the New York Stock Exchange.

2009 The first meeting of the [Sustainable Stock Exchange \(SSE\)](#) was opened by UN Secretary-General Ban Ki-Moon in New York City.

A review of 160 socially responsible mutual funds found that 65% of the funds had outperformed their respective benchmarks.

[GRESB](#) was established to provide standardized data and a benchmark for ESG-driven real estate and infrastructure investments.

2011 The [Sustainability Accounting Standards Board \(SASB\)](#) was launched to standardize sustainability accounting and measurements across 77 industries.

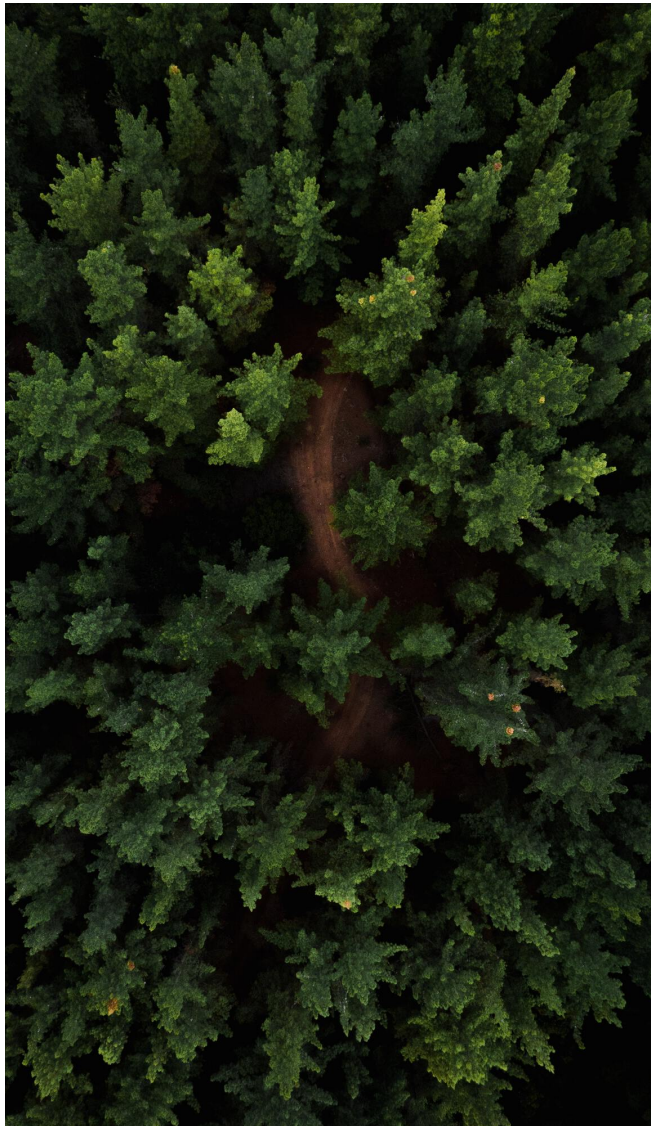


2015 The United Nations introduced their 17 Sustainable Development Goals (SDGs) which they described as a 'blueprint to achieve a better and more sustainable future for all'.

2016 The Paris Agreement – signed by 195 countries the previous year – came into effect, aiming to limit global warming to well below 2°C, preferably to 1.5°C, compared to pre-industrial levels.

2017 State Street Global Advisors (SSGA) voted against the re-election of directors at 400 companies that failed to make any significant effort to appoint women to their all-male boards.

62% of ExxonMobile shareholders went against management's recommendations by voting to require the world's largest oil and gas company to report on the impacts of climate change on its business.



2018 BlackRock's CEO, Larry Fink, published his [annual letter to CEOs](#), urging them to consider long-term value over short-term gains.

The Intergovernmental Panel on Climate Change (IPCC) released its [Special Report on Climate Change](#) on the impacts of global warming of 1.5°C above pre-industrial levels.

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.'

2020 The [US Securities and Exchange Commission \(SEC\)](#)'s investment committee decided to create an ESG disclosure framework for consistent and comparable information without the use of a third-party rating agency.

2021 The [EU's Sustainable Finance Disclosure Regulation \(SFRD\)](#) came into force, effectively forcing disclosure on how financial products consider sustainability.

2022 Metrikus created the report you're reading right now!





**Data: the lifejacket
that keeps ESG
afloat**

Data: the lifejacket that keeps ESG afloat

If the year is 1983 and you find yourself in Fiji looking at a notice asking you to reuse your hotel towels for the sake of the environment, then your name is probably Jay Westerveld and you're about to come up with the term "greenwashing."

Mr. Westerveld was lodging in a beach resort undergoing large,

expensive developments that were detrimental to the local environment and the irony of their plea didn't go unnoticed. This practice of misleading environmentalism has been around since at least the 1960s and is still rife today: from oil conglomerates to airlines, the eco-hypocrisy fueled by prevalent profit-over-planet mentality has

caused mass skepticism of anything labeled "green."

Some notable examples of greenwashing in recent years include Nestlé, who in 2018 stated its 'ambitions' to make all of its packaging recyclable or reusable by 2025, without actually providing any targets or timeline to achieve this. Similarly in 2019, fast-fashion

manufacturer H&M released a line of "green" clothing named 'Conscious', specifically inferring the environmental benefits of the collection in their advertising, but failing to provide any substantial definitions on the sustainability of the clothes. Or quite simply Coca-Cola, the largest plastic polluter in the world adamantly advertising that they are eco-friendly and

sustainable. As the world began to value brands with environmental consciousness, brands began to see the value of appearing environmentally conscious, and this birthed the faux opportunity to make grandiose but unattested pledges to the wellbeing of our planet.

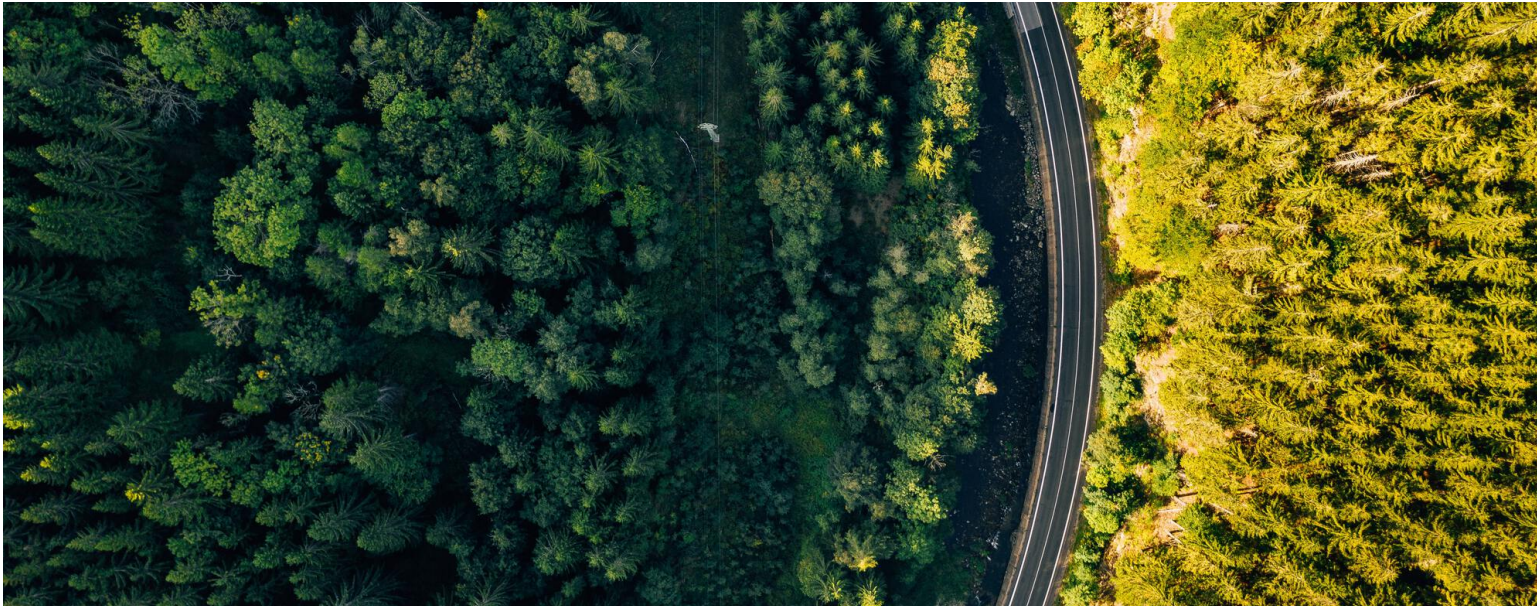
The environmental cosplaying performed by large multinationals

had the unfortunate consequence of raising the public eyebrow towards all corporate attempts on environmentalism. This was especially evident in the real estate industry, and for good reason. The pioneers of the green movement provided certifications that on the surface level had the same baseless, vague, pat-yourself-on-the-back sentiment of

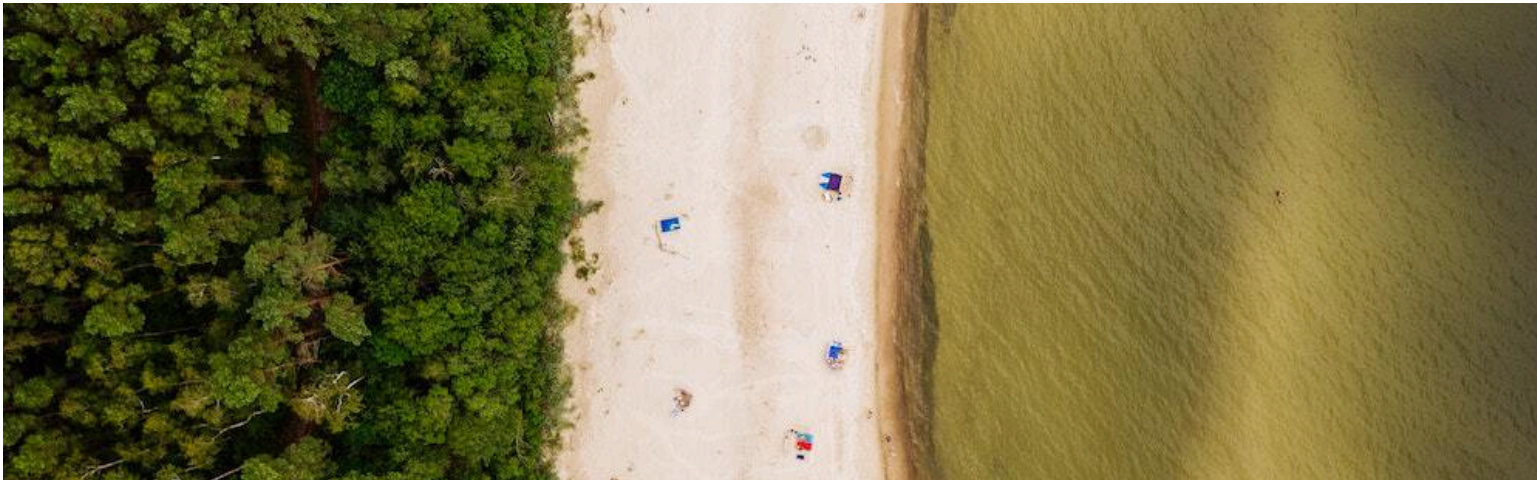
greenwashing. The theory was good: buildings as a whole are carbon-intensive, so those that are resource efficient will be labeled 'green', and those that aren't will be 'brown' – or something to the same extent.

The initial definitions of green buildings thus revolved heavily around the concept of resource

And even then, trying to figure out a building's environmental performance based on its certification is a bit like trying to guess someone's job by their haircut.



efficiency in construction and operation. But how do they measure resource efficiency? And how do they continue the measurement of a building's performance? All the way through the evolution of the concept of green buildings, into the 1990s and beyond, it was nigh impossible for real estate investors – let alone tenants – to gather viable information on a building's environmental performance other than an initial certification by BREEAM, LEED, or another such



awarding body. And even then, trying to figure out a building's environmental performance based on its certification is a bit like trying to guess someone's job by their haircut. The data is two dimensional, and on its own is insufficient to encourage the real, meaningful change needed to drive global environmental goals.

The Achilles heel of greenwashing is transparency, and the real estate green movement was highly commendable in its efforts to

encourage this with the environmental evaluation of buildings. But transparency is hard to achieve without data. Good quality, accessible data. We're in the midst of a transition to the age of ESG, which means that certifications on their own are no longer adequate. We need a sharp focus on data-driven transparency to ensure that the correct decisions are made; where to invest our money, which businesses to avoid, where to give a helping hand. If

everyone had open access to companies' CO₂ reports, it would be easy to separate the walkers from the talkers. And with accessible, transparent, and mandatorily reported ESG data, greenwashing would go from public subterfuge to data fraud. While ESG frameworks undergo scrutiny and skepticism on the presumption of being just another failed green movement, it is ever important to put data at the strategic forefront and drive transparency to erase all



Sami Mustapha, ESG Consultant at Metrikus

public doubts and ensure the longevity of the movement. As we accelerate to a point of no return, we need the legs of environmental change to slam on the brakes, ideally, now. How well, and how quickly the brakes work will be in part facilitated by corporate accountability, which is enabled by transparency which in turn, is led by access to data.



ESG: the current state of play

How bad are buildings?

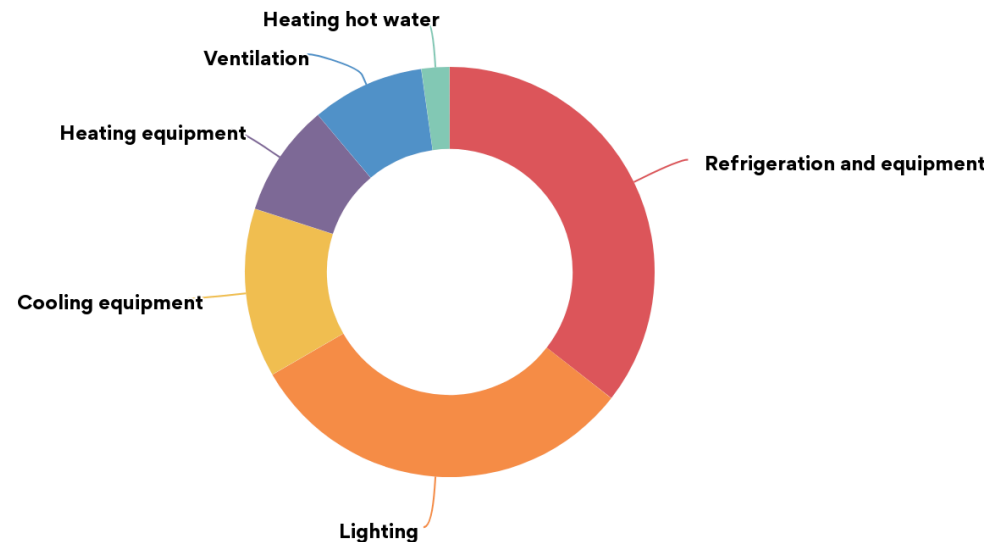
We all know that buildings can be inefficient and have a negative impact on the environment, but just how bad are they? It's time to find out...

Buildings and construction are responsible for [39%](#) of global carbon emissions, with the energy used to power buildings accounting for [28%](#).

In a typical commercial building, the energy usage per year is approximately [22.5 kWh/square foot](#):

Typical energy usage in a commercial building

kWh/square foot



everviz.com

More than [3.6 billion](#) cooling appliances are in use around the world – a number that's growing by 10 devices every second. They're a huge source of emissions, and it's thought that by the end of the century they could account for as much as a [0.5°C](#) rise in global temperature.

Producing cement – the key ingredient in concrete – generates around [2.5 billion](#) tonnes of carbon dioxide a year – about 8% of the global total. And concrete consumes almost [10%](#) of the world's industrial water supplies.

As the global population rises, urban areas around the world are booming, and that means more and more buildings are going up. By one estimate, the world will add [2 trillion](#) square feet of buildings by 2060 – the equivalent of putting up another New York City every month for the next 40 years.

So, it seems that buildings are pretty bad after all. And when you think about the fact that 80% of buildings that will exist in 2050 have already been built, it's clear that retrofitting will be absolutely key when it comes to closing this gap and achieving net zero targets.

We need to act now and take a broad and holistic approach to sustainability that incorporates how buildings affect the people within them, as well as their environmental impact.

Head to [ESG: the future of the world?](#) to find out more about the tech that can transform the future of buildings

And when you think about the fact that [80%](#) of buildings that will exist in 2050 have already been built, it's clear that retrofitting will be absolutely key when it comes to closing this gap and achieving net zero targets.



Regulations and 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.

Issues with greenwashing and inconsistency have led to many



questioning the integrity of not just ESG reporting, but ESG as a whole. And these attacks are increasingly coming from people in high places.

- Elon Musk [tweeted](#) that 'ESG is a scam' after Tesla got removed from a major ESG index for a lack of disclosure around key environmental and social issues and allegations of racism on the factory floor.
- Noted venture capitalist and PayPal founder, Peter Thiel, said in [a speech](#) that 'ESG is a hate

factory' and equated it to the Chinese Communist Party

- Former U.S. Vice President, Mike Pence, [tweeted](#) that 'liberal activist investors are forcing private companies to abide by ESG investing principles, elevating left-wing environmental, social, and corporate governance goals over the interests of the business.'

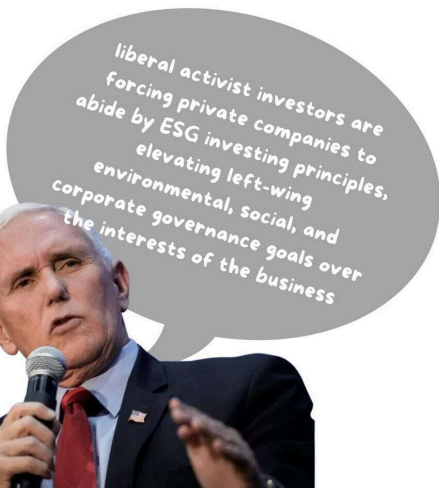
Is ESG just a scam? Of course not, but there is undoubtedly a lot of work to be done to move the industry forwards.

In response to an EY survey, [89%](#) of investors said they would like the reporting of ESG performance – measured against a set of globally consistent standards – to become a mandatory requirement.

It's time to move towards a more transparent reporting framework that builds trust and improves collaboration.

What are the main frameworks for ESG reporting?

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 like climate change, human rights and corruption.



2. [Sustainability Accounting Standards Board \(SASB\)](#)

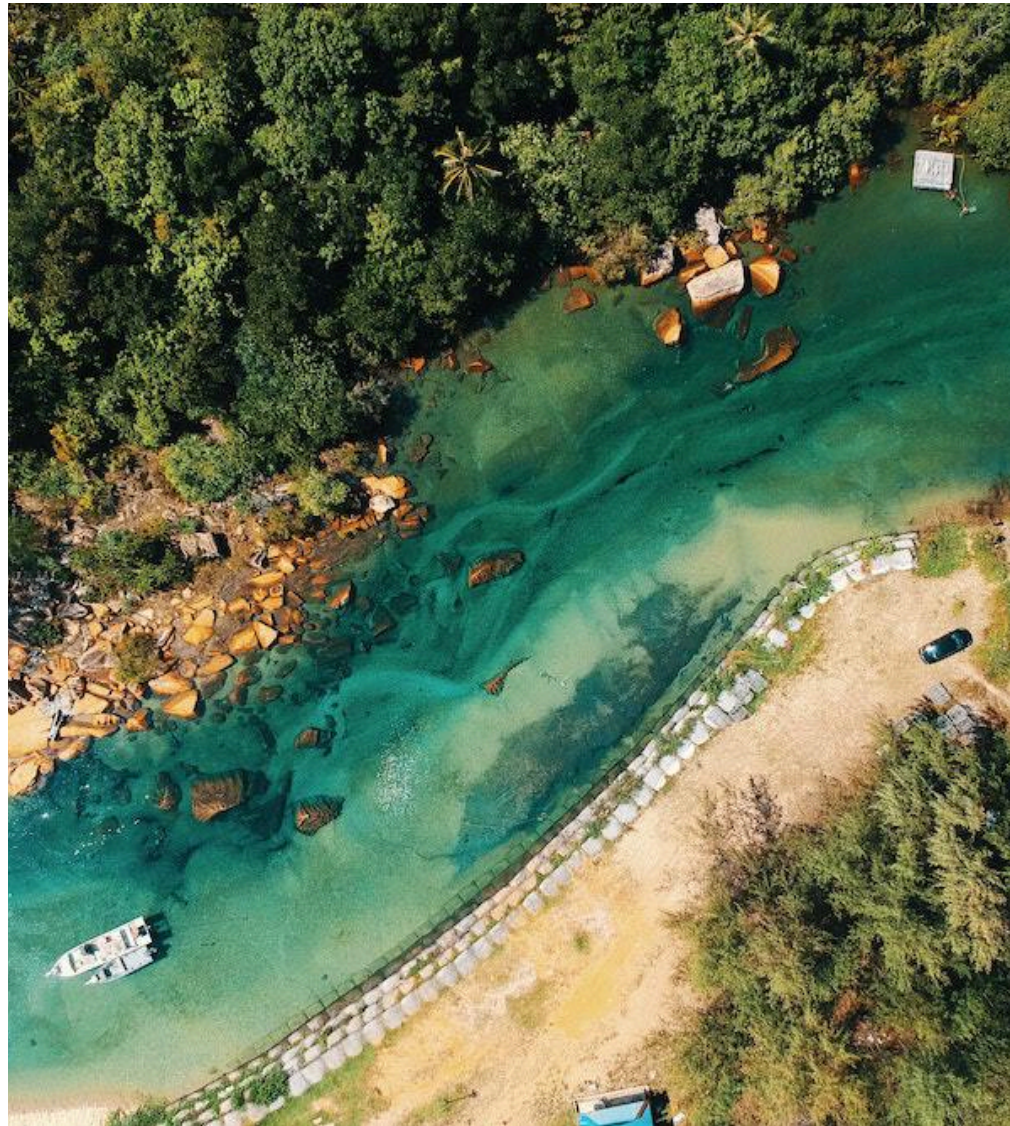
The SASB is an independent non-profit, whose mission is to develop and disseminate sustainability accounting standards that help public corporations disclose useful information to investors. It's the most widely used reporting standard in the US.

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.

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?

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!



US regulation of non-financial reporting

In the US, the [Securities and Exchange Commission \(SEC\)](#) has 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
- 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.

If the proposal is adopted, it will have a massive impact on listed companies in the US, as only a third of them reported on this type of information in 2019 and 2020.

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.

As of 1st January 2024, 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 rules was adopted by the Parliament in November 2022, and applies to large companies, listed and unlisted:

- 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

Non-EU companies with substantial activity in the EU (with a turnover over €150 million euro in the EU) will also have to comply.

This means that around 50,000 companies will need to publish reports, a whopping five times more than before!

Do you think ESG reporting should be mandatory for every company across the world?

Yes

No

I'm not too sure

Post answer

Sustainable buildings:

regulation spotlight



US

[Local Law 97 \(LL97\)](#) is a regulation set out by the New York City council as part of the Climate Mobilization Act. It came into effect in November 2019, and means that from 2024, all buildings above a specified size will have to comply with new greenhouse emissions caps, or face a fine.

Europe

The Energy Performance of Buildings Directive makes it compulsory for every new building to be a nearly zero-energy building (NZEB) from 2021 onwards across the European Union. 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. There are also several country-specific regulations, like the [Tertiary Decree](#) in France which requires the reduction of energy consumption in the tertiary sector.



UK

[Streamlined Energy and Carbon Reporting \(SECR\)](#)

was implemented by the UK Government on 1st April 2019. It makes it mandatory for large businesses to report their energy and carbon emissions, as well as efficiency measures taken throughout the year, on an annual basis.

[Part F of Schedule 1 to the Building Regulations 2010](#)

came into effect on 15th June 2022. For the first time, air quality monitoring is regulatory for the design and construction of both domestic and non-domestic new builds in England. Specifically, the change means that CO₂ needs to be continuously monitored.

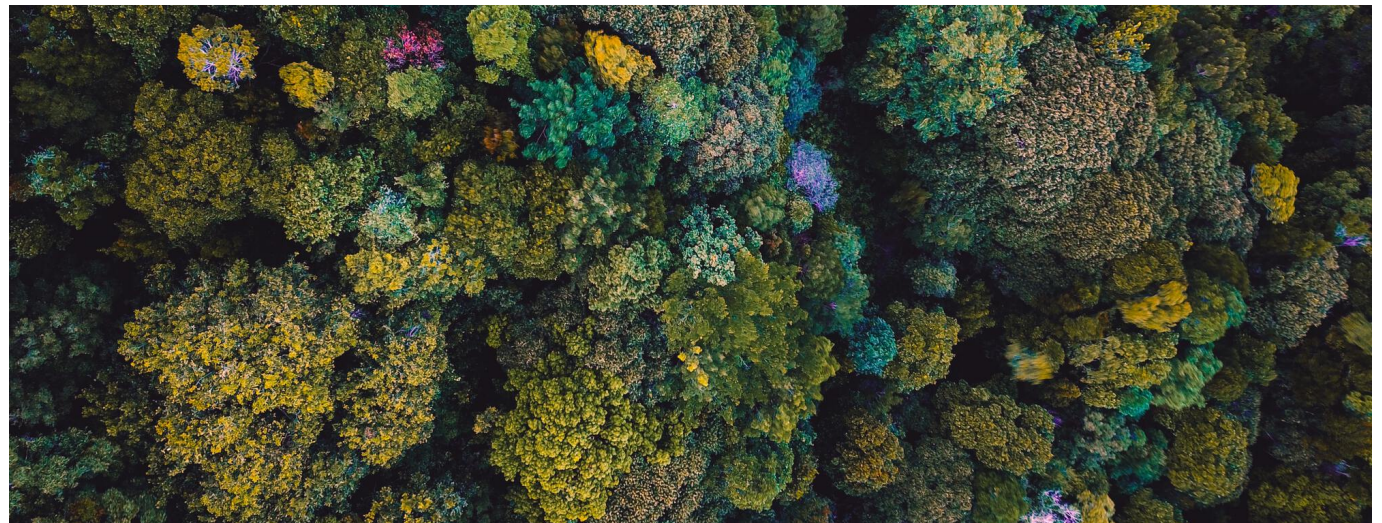
You can [read our breakdown of Part F and what it means for you here](#).

What next?

As we edge closer to a global framework for mandatory ESG reporting, companies need to start monitoring their impact now.

Those that try to cut corners or delay the inevitable will quickly be left behind – both in the ratings and in the marketplace.

Prioritizing ESG isn't just a one-off thing; it's an ongoing, iterative process that needs to be embedded at the core of a business. So, what can companies do now to be prepared for the future of ESG? It's time to find out.



Comfort vs climate: can we find a healthy balance?



Comfort vs climate: can we find a healthy balance?

Buildings are essential. They are where we live, where we rest, and where we work. However, they are also responsible for nearly [40%](#) of global emissions. In the US alone, commercial buildings account for [20%](#) of all the energy used, and as much as [30%](#) of that goes to waste. This means if we are going to successfully transition to a low-carbon future it is absolutely critical that we improve the energy efficiency of buildings. In order to achieve this, companies are going to have to reduce the energy used on things like heating, lighting and indoor air quality.



However, in this new hybrid-working world, wellbeing and employee experience have both been brought to the forefront. This in turn creates tensions between climate and comfort, also known as the E and S of ESG. When we're focused on getting our

temperature and the air quality right for tenants and employees, what impact does this have on our energy consumption?

Let's imagine a situation: you're using a building efficiency software such as Metrikus, and you get an

alert that the CO₂ levels are too high, so you adjust your HVAC system to deliver filtered air to the offending area. Naturally, your energy consumption will begin to rise. The question is, where does the line get drawn between a company prioritizing the wellbeing



of their employees versus energy consumption, and can they prioritize both?

I think you can. While there are tensions between E and S factors when it comes to buildings, there is a symbiotic relationship, too. For example, you can overlay your occupancy data with your energy data to reduce your consumption at times when tenants aren't in the building. This means our customers are able to reduce energy consumption with minimal disruption to tenants. As well as this, with real-time, accurate data you can make better-informed decisions – for example, if only 30% of staff are in the office you could ask that people move to one floor and turn the lights and air filtration off on the others. You can even use trends to make this a policy: after a certain time, all floors bar one are closed, but the one that remains

open is kept at ideal working conditions for the employees' comfort and wellbeing.

You can also enable preset parameters so that you don't have the conflict in the office between some people finding it too hot and some people finding it too cold. You can have preset temperatures, and let everyone know what those temperatures are ([men tend to prefer cooler temperatures to women](#) which means women are often colder in the office).

Other extraneous factors are going to have an increasingly serious effect on the energy consumption of urban buildings, such as [local climate change and urban overheating](#). We've already seen this with several heat waves here where I'm based in London, as well as across Europe and the US. As a result of the climate crisis, we are



going to have hotter summers, requiring buildings to be cooled even more.

Here in the UK, where homes aren't equipped for high temperatures, we've already seen a trend of people going into the office that have better aircon on days where they would typically work from home.

But then we return to the problem: how are people then going to reach a net zero goal if they're having to put their aircon on? Unfortunately, we're in a vicious cycle. In light of the complexities, it's clear that renewable energy will have a pivotal role to play. To be able to keep people happy, comfortable and productive at work, even in the face of things like rising temperatures, but not increase energy consumption massively; it's a very tricky situation.

Reporting on your businesses' sustainability is always going to be complicated because there are so many aspects to consider – both social and environmental. There is simply never going to be a one-size-fits all answer, as every company and every building is completely different.

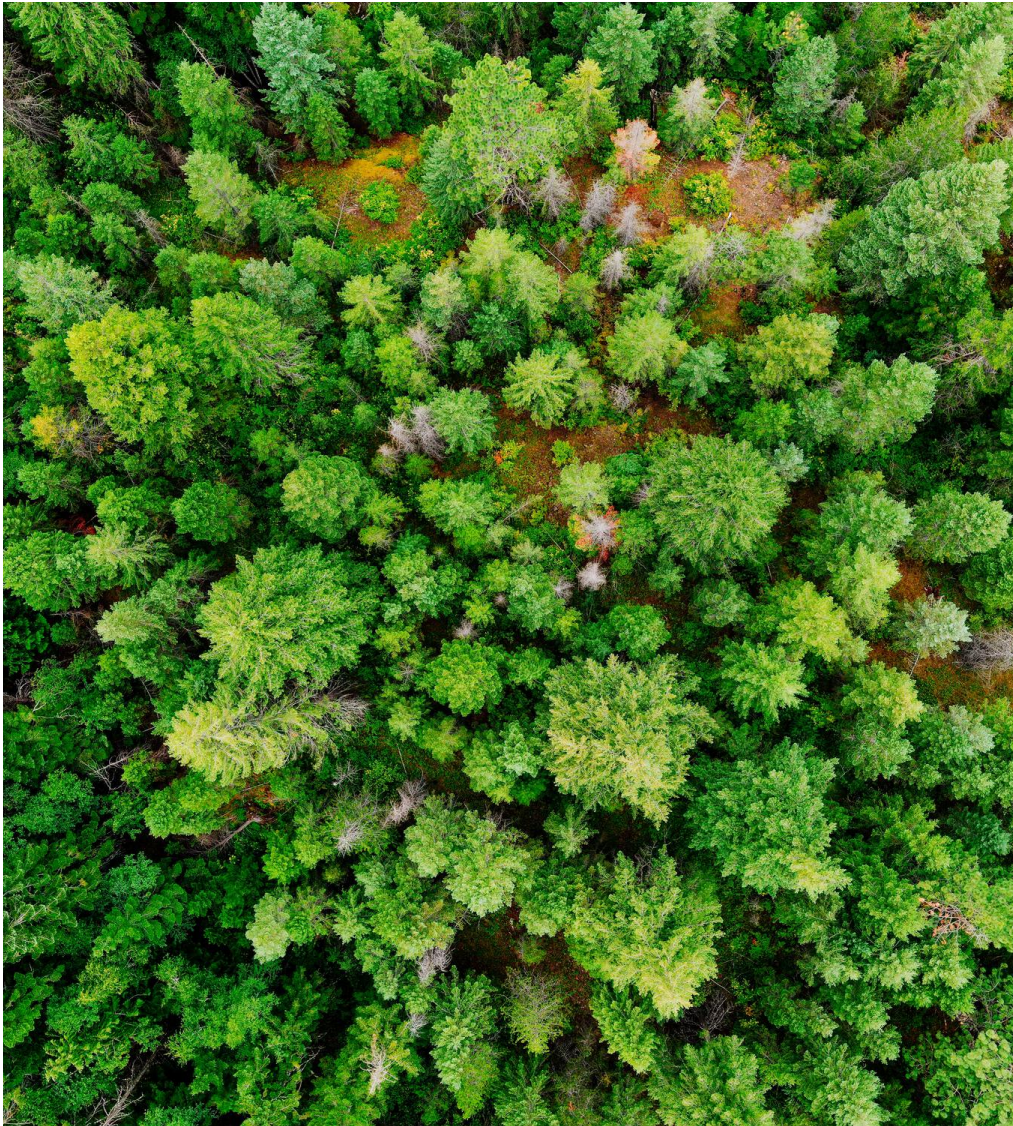
To achieve the right balance between comfort and climate, we can't shy away from these tensions and difficulties. We need to embrace a more holistic, data-driven approach to buildings that considers people and the planet in tandem. That way, we can make healthy and sustainable buildings that are truly fit for the future.



Sally Scott, Senior Product and Partnership Marketing Manager at Metrikus



ESG: the future of the world?



The focus on ESG issues is growing, fast. As ethical operations become a bigger priority worldwide, more regulation is being introduced to encourage companies and governments to be more sustainable.

- **Technology is increasing the accessibility of ESG monitoring**
- **Transparency is more expected from companies of all sizes**
- **Gathering and processing data will become even easier and cheaper**
- **Smart algorithms will allow for a more accurate interpretation of qualitative information**
- **Good stewardship and low carbon practices are more important than ever**

Key factors like technology, transparency and data are more important and accessible than ever before, so companies have no excuse when it comes to fulfilling their environmental commitments.

So, what does the future of ESG look like? It remains a complex space, with greenwashing and inconsistent reporting being common issues, but with the right preparation, tools and awareness of what's to come, organizations can really maximize their ESG outputs with positive impact.

How to be prepared

International regulators are introducing new standards around ESG metrics, with Biden [recently announcing](#) climate change and environmental justice as priorities, and countries like [Canada declaring](#) ESG disclosure will be mandatory for financial companies in 2024.

This is coupled with the rise of many environmental-specific regulations too. Buildings and construction account for a huge portion of carbon emissions produced across the world: [39%](#), to be precise. So it's no surprise that many countries are introducing stricter regulations in a bid to reduce their carbon footprint and minimize environmental impact.

Organizations are increasingly expected to operate more sustainably, treat workers ethically, and have frameworks in place to report transparently on this data.

The key to preparing your business for this change is understanding how you currently operate, and implementing the changes necessary to fulfill ESG responsibilities. How do you go about this? It's simple: **proper measurement and reliable data.**



Proper measurement

Any successful ESG strategy starts with accurately measuring your performance. It's the only way to accurately assess what you're using, benchmark how this compares to where you should be, and get started on making any changes.

It's essential for this data to be collected and collated in a central place, where it can be verified by a third-party expert, 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 start collecting high-quality data now to get ahead of upcoming legislation.

Implementing a real-time monitoring solution is key to establishing ESG reporting – not to mention helping to reduce the cost of running a building by minimizing energy usage and improving employee wellbeing.

Companies should start by focusing on the metrics which have the largest presence in their day-to-day activities. For example, a clothing company might start by prioritizing labor practices, whereas the priority for a real estate giant should focus more on their impact on the climate.

Gathering accurate data

Once you've started measuring your ESG data, what can you do with all this information? Quite a lot, actually.

What ESG metrics can you measure in your building?

1. Energy monitoring

Energy monitoring does what it says on the tin: monitors your energy usage. But it also has other unexpected benefits, such as detecting inefficiencies in your building systems so action can be taken at the earliest possible opportunity. This is a fundamental aspect of making any building more environmentally friendly and improving ESG performance.

2. Indoor air quality monitoring

Indoor air quality (IAQ) can have a huge impact on the wellbeing of your employees. Poor IAQ can cause sick building syndrome symptoms like dizziness, lack of concentration and headaches – as well as severely impacting productivity.

You can also measure ESG metrics like water monitoring, waste monitoring and noise levels – all of which can impact occupant wellbeing significantly.

Having accurate, real-time (as well as historic) data gives you the information you need to analyze your building estate's ESG performance. Historic occupancy and energy data can be overlaid to identify reduction opportunities and minimize emissions. Real-time water monitoring can optimize your water usage and detect leaks in real time, decreasing consumption by up to 40% in some cases.

Likewise, IAQ data can be harnessed to establish any harmful pollutants and make necessary changes – such as installing air purification systems.

More importantly, any adjustments can then continue to be monitored, and this data can be collected, analyzed, and compared to establish improvements in ESG performance.



Tools

So you want to improve the ESG rating of your building? Luckily, there are many tools to help you do exactly that.

Smart sensors

As we've mentioned, gathering accurate data is a key part of ESG reporting, and sensors are an effective way to measure and record real-time information. IoT sensors can collate data such as:

- Energy usage
- Water usage and quality
- Noise levels
- Carbon footprint
- Waste management

Sensors can be used to carry out [real-time occupancy monitoring](#), which improves ESG performance

by reducing energy consumption by only using energy in occupied spaces, ensuring compliance with legal occupation requirements, and enabling hotdesking and flexible workspaces.

Using IoT sensors to [monitor indoor air quality](#) and track the presence of harmful pollutants is a great way to improve occupant health, wellbeing and productivity. With a platform like Metrikus, smart alerts can notify you when key air quality parameters (such as carbon dioxide) deviate from their optimal zone. This way, steps can immediately be taken to maintain a healthy environment and minimize harmful effects of poor IAQ.

Having access to a range of real-time data through IoT sensors allows you to better understand your building, and optimize how the space is being used.

This data can then be analyzed and changes can be implemented to improve both the sustainability of your space, and the wellbeing of its occupants. For instance, some environmental sensors provide heat maps so that you can easily identify areas that fall outside the desired range.

Alerts can also be set up to notify the relevant personnel when environmental parameters deviate from the optimal zone, and the necessary action can even be automated using your BMS. This means minimal energy wasted, reduced carbon emissions, and a better working environment – sounds good to us!

Smart building platforms

Once you've got all this information, what can you do with it? Use a smart building platform like Metrikus to track all your ESG data

in one place, and trace it with complete accuracy. With all your building data stored and analyzed in one centralized system, it's far easier to see whether a company is hitting its targets and identify areas of improvement.

Reduction strategies

You've collected your building data and are tracking it in a smart building platform (good for you!), but now what?

What does net zero mean, and why should you care?

It's time to look into reduction strategies and actually minimize the environmental impact of your building. There are different sustainability aims worldwide, the most common one being for companies to hit net zero emissions. Over 70 countries, including massive polluters such as China, the United States and many countries in the

European Union, have pledged to [halve global emissions by 2030](#).

This is a vital step in the fight against climate change, but what does it actually involve? To be net zero, a company has to reduce its emissions by 90% to 95% from its base year – regardless of any growth during that time. The final 5% to 10% of emissions must be removed using the most impactful types of offsetting (like direct air capture), which actually remove carbon from the atmosphere for good.

Calculating emissions

The first move is to calculate your emissions – which is the total CO₂ emissions a company has released over the past year. Having energy monitoring sensors in place will aid with this, and tools such as Future Learn's [carbon calculator](#) are a great way to establish your Scope 1, 2 and 3 emissions.

From here, you can identify the biggest areas for improvement and validate these goals using third parties, such as the Science Based Targets initiative (SBTi).

Offsetting and removal

There are many different types of offsetting, and not all are created equal. It's important to do your research, opt for initiatives that meet key project standards, and be wary of greenwashing.

Examples of offsetting projects:

Renewable energy initiatives

This type of offsetting aims to build or maintain renewable energy sources, such as wind solar, or hydro sites. As well as reducing the use of fossil fuels, these projects also create employment opportunities.



Conservation and rewilding

These types of schemes focus on the conservation of natural habitats, such as forests and oceans. Over time, this will remove carbon from the environment, but has added benefits of boosting ecosystems and protecting wildlife. However, there are issues with measuring how much carbon is actually being reduced through these projects, but advances in technology will hopefully make

these improvements easier to track over the coming years.

Artificial carbon removal

These kinds of offsets use technology to actually extract carbon from the atmosphere, rather than reduce it. This includes projects such as direct air capture, which removes and stores carbon from the air. This is more difficult to do than other types of offsetting and is still far more expensive.

Metrikus

[Metrikus](#) is a market-leading software that combines multiple data sources and sensors to provide revolutionary insights, make spaces smarter and help you reach your ESG targets.

We make data accessible and understandable, with real-time data, bespoke charts, graphs and analytics – all in one pane of glass.

Our platform gives companies the tools and information they need to get started with ESG and overcome any challenges. Our distinctive approach to integration future-proofs your building; our platform integrates with any system or hardware, so it's truly a system that can grow with your business.

Environmental

Our real-time energy monitoring solution helps companies to reduce their carbon footprint by monitoring performance, detecting inefficiencies, and allowing you to make automatic adjustments via a Building Management System. You can also overlay energy data occupancy data to identify further opportunities to reduce consumption.

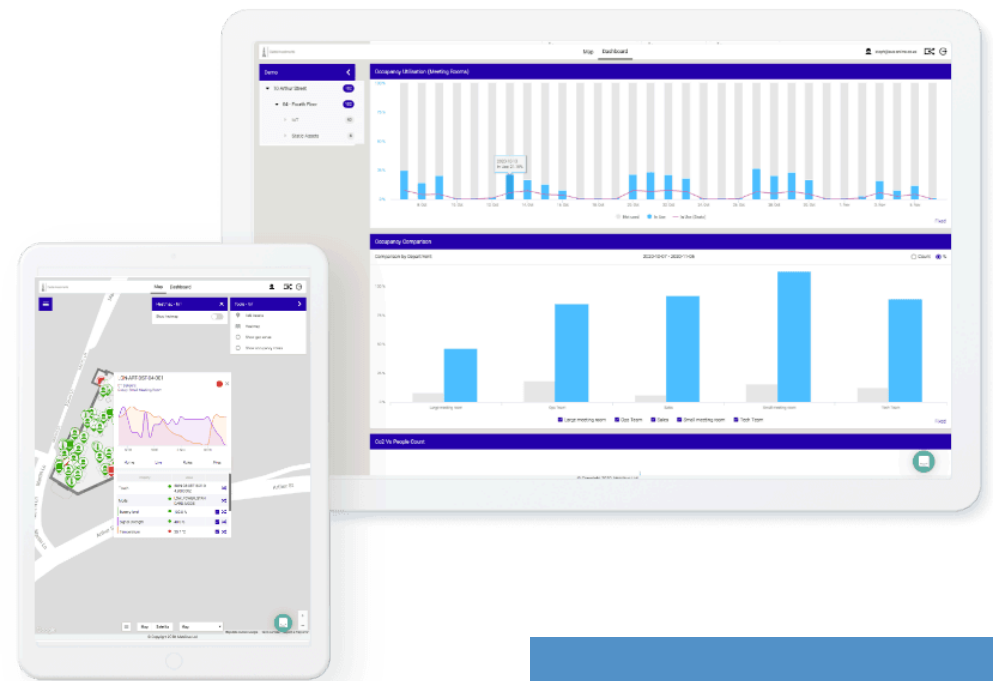
Social

Good indoor air quality (IAQ) is essential for productivity and employee wellbeing. Through installing sensors and tracking key factors (such as temperature, humidity, carbon dioxide and particulate matter) in real time, you can ensure IAQ never drops below optimal levels and understand how this could impact employees.

Governance

With our platform, accurate, secure and up-to-date data is available at your fingertips. We measure and report on key ESG metrics, and display them in a single place that can easily be shared with all stakeholders.

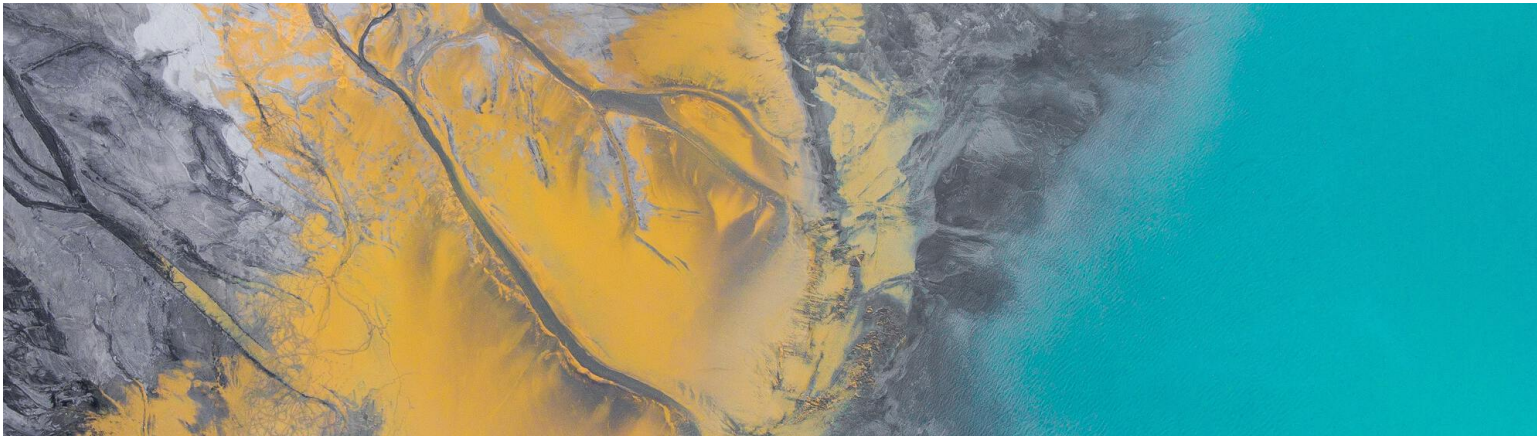
Our platform allows you to understand your building, safety, people and maintenance, efficiently track ESG performance and take steps to improve ESG ratings.



[Watch a short demo](#)



IoT and ESG



If you've got this far, we assume you're on board with ESG being a growing part of business operations – and something companies need to get to grips with fast. Despite being a fast-growing field, collecting accurate data still proves to be a challenge for many organizations.

A BlackRock survey found that the majority (53%) of respondents were hesitant about adopting sustainable investing due to 'poor quality or availability of ESG data and analytics.'

Effective action isn't just about data measurement, it's about action too. When it comes to buildings, IoT can provide efficient solutions to fulfilling ESG criteria and operating more ethically.

IoT and ESG: the perfect pairing?

We've already explored the role technology plays in ESG reporting and measurement. Take a look at the [Tools](#) section to read more about IoT's valuable role in enhancing building performance across key ESG metrics through minimizing energy usage, improving occupant wellbeing and reporting on valuable data in real time.



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

Matthew Marson, Co-Founder of Smart Building Bootcamp



Some companies are even developing IoT solutions with specific ESG metrics in mind; for instance, current performance could be analyzed in real time against local legislation or regulations.

The world of IoT is constantly evolving, and we're interested to see how these changes will impact ESG performance and reporting in a number of ways.

How can the cloud help your ESG efforts?

Businesses across the world are upscaling their use of cloud services to enhance their digital capabilities due its scalability, efficiency and data security.

But cloud technologies can help in achieving ESG, too, by:

- Enhancing ESG reporting through automation, data storage and analysis

- Accelerating data collection from multiple sources
- Providing accurate comparison between current performance and ESG targets

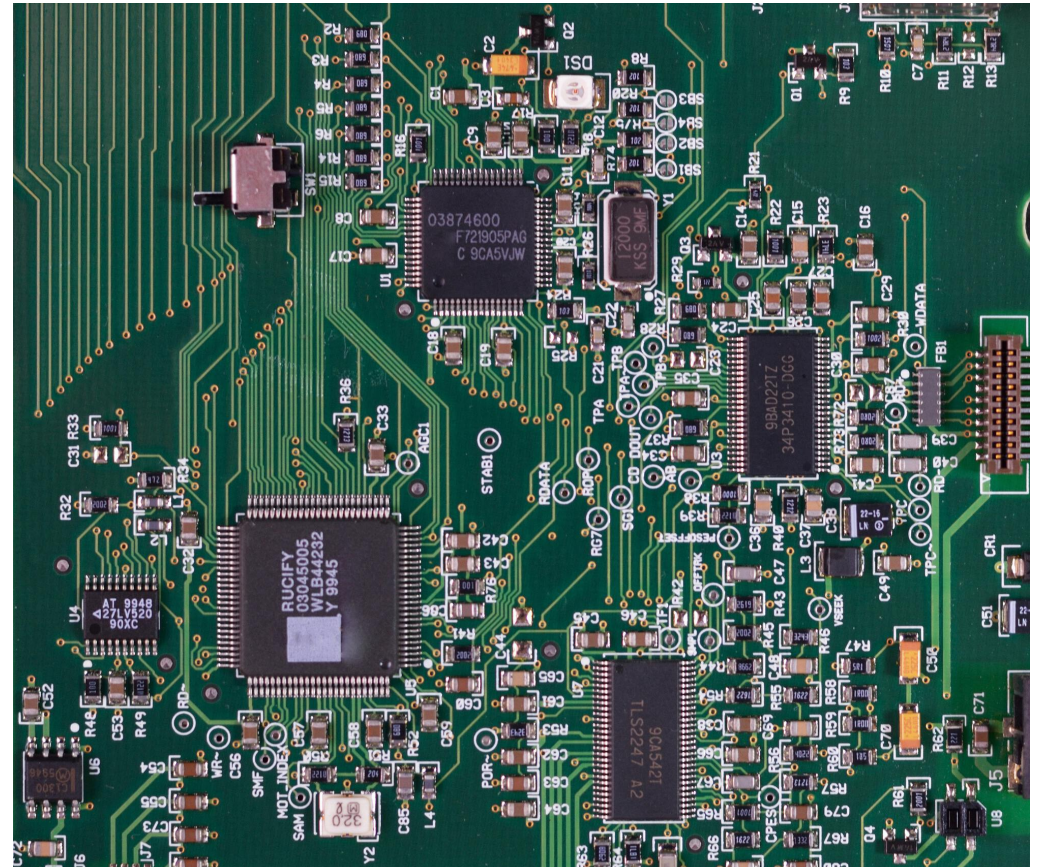
Reducing operational costs

These benefits all make accessing, collecting, and using ESG data much more efficient and minimize the friction often associated with this process – this way, businesses can get on with the all-important task of implementing change.

This all sounds great, but are there any challenges? Due to the nature of cloud computing, it can be more vulnerable to cybersecurity breaches than traditional data collection and storage methods, and can sometimes be difficult to integrate with certain systems. But establishing clear roles and responsibilities of cloud ownership within a business should alleviate concerns.

If used properly, cloud computing can be a helpful aid in achieving ESG targets, and is already in use today. A recent PwC survey in the US found that 60% of business

leaders already, or are planning to, use the cloud to enhance ESG reporting, and 59% were already, or are planning to, use it to execute ESG strategies.



Artificial intelligence, machine learning and ESG

The acronym AI usually conjures up images on sentient robots and driverless cars, but it could actually play a useful role in helping companies achieve their ESG targets.

Although ESG is fast growing, there are still no standardized methods for reporting on vital data, which can present challenges to companies trying to disclose information about sustainability or social operations. Many businesses lack clarity around what data to collect, or be unsure of how to collect it.

Where AI can help is with ESG reporting – going far beyond the capabilities of any alternatives; using



We may be able to detect whether managers are ‘greenwashing’ when they talk about their firm’s ESG policy.

Mike Chen, Director of Sustainable Investing at PanAgora Asset Management



AI for ESG reporting means better quality data and enhanced analysis. And the capabilities of artificial intelligence are developing rapidly, with algorithms constantly evolving to become faster and more accurate.

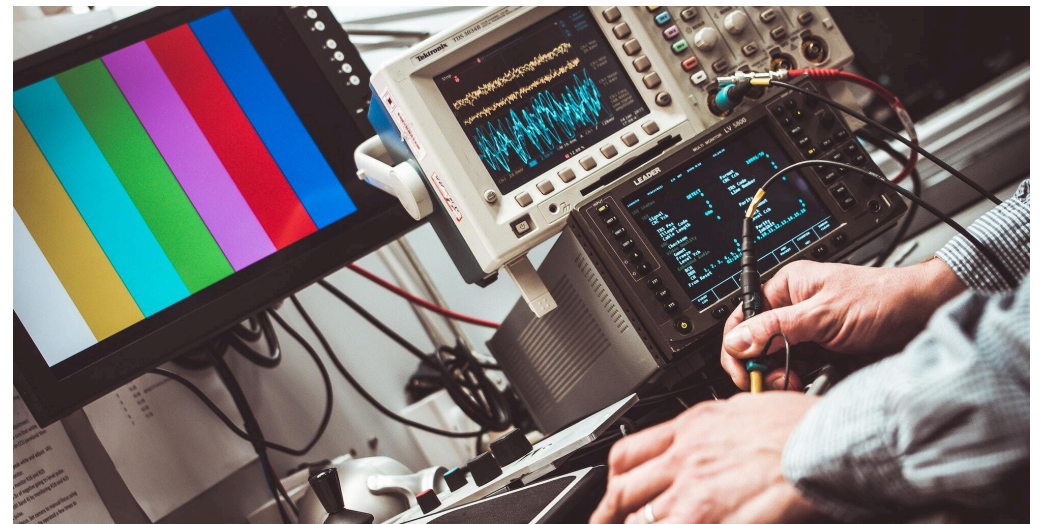
This means they’ll be able to digest both qualitative and quantitative information faster than ever before, simplifying ESG reporting for organizations worldwide.

Machine learning is proving to be a valuable method for linguistic analysis, with engineers using this technology in entirely new ways. In Boston, a group of researchers have developed advanced machine learning to analyze previously untapped information – such as LinkedIn posts – to determine a company’s true commitment to ESG.

‘We may be able to detect whether managers are ‘greenwashing’ when

they talk about their firm’s ESG policy,’ said Mike Chen, Director of Sustainable Investing at PanAgora asset management.

Already, AI holds an exciting position in ESG reporting, with the potential to standardize how companies collect data and what they report on, prioritizing transparency and accuracy, and machine learning opens up the possibility of accessing entirely new datasets.





**Building safer
environments with
IoT**



Michael Grant shares how [Metrikus](#) uses the internet of things to create safer, cost-effective and sustainable building spaces for its customers



We make data accessible and understandable, with real-time data, bespoke charts, graphs and analytics – all via one source. By driving building efficiency, we help companies to reduce costs and emissions and improve their bottom line.

[Michael Grant](#), COO at [Metrikus](#)

Understanding how to optimize the environment, maintenance and usage of their facilities is key to the success of any organization. And visualization software provider and Microsoft partner Metrikus is developing software to help companies to do just that.

“Metrikus provides revolutionary insights, making spaces smarter, safer and more sustainable,” says Michael Grant, COO at Metrikus. “We make data accessible and

understandable, with real-time data, bespoke charts, graphs and analytics – all via one source. By driving building efficiency, we help companies to reduce costs and emissions and improve their bottom line.”

Metrikus is a registered Microsoft independent software vendor (ISV) partner and member of [Microsoft for Startups](#). Its platform is built using a range of technologies on Azure, including Azure IoT Hub and Azure Digital Twin.





“By leveraging Azure, we can gather real-time reliable data using the platform as a service tool, allowing us to reduce our operational costs,” says Grant. “Azure is now the backbone of our platform and we have conducted a range of

technical training sessions with Microsoft’s ISV FastTrack team that have been immensely valuable. We have gone from being uncertain about the way that the different tools work, to Azure being the default choice for technology decisions.”

The company uses the internet of things (IoT) to help customers across the financial services, manufacturing, retail and public sectors connect thousands of assets and sensors in one digital platform. This enables financial services institutions

to share data collected from components with shareholders and stakeholders to increase collaboration while manufacturing companies can use data insights to reduce asset failures, downtime and maintenance costs.

“We ensure factories are safe, healthy and compliant environments, all while lowering costs and increasing profits,” says Grant. “We can also help retailers to improve the customer experience with real-time occupancy and indoor air quality monitoring, ensuring stores are safe and healthy environments.”

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We ensure factories are safe, healthy and compliant environments, all while lowering costs and increasing profits. We can also help retailers to improve the customer experience with real-time occupancy and indoor air quality monitoring, ensuring stores are safe and healthy environments.”

Michael Grant, COO at Metrikus



“Meanwhile, healthcare providers can benefit from [asset tracking](#), automated cold storage, risk management and smart cleaning, all of which are enabled through Metrikus’ [healthcare](#) and [smart cleaning](#) solutions.”

Metrikus has also developed an environmental, social and governance ([ESG](#)) [solution](#) to help businesses become more sustainable to combat the impact of global warming and climate change. The ESG solution combines multiple data sources and sensors to provide insights into how to improve the energy efficiency of a building.

A great example of this is the work that Metrikus did with Manchester



Metropolitan University (MMU). MMU had recently built a state-of-the-art Business School. As the Business School was a very expensive project geared towards responsible and sustainable consumption, MMU partnered with Metrikus to fully understand and [optimize their energy use](#). Metrikus deployed sensors and overlaid the occupancy data with energy use. MMU was immediately able to see that a high amount of energy was being used compared to the occupancy levels.

Off the back of this data, MMU was able to optimize BMS settings and reduce operational hours depending on which areas of the building were occupied in

line with footfall data. This quickly helped them to significantly reduce their carbon emissions and make their space more sustainable.

More recently Metrikus has worked with a multinational consultancy firm on their estate in Spain. Understanding how their people use their offices combined with air quality data allowed them to reduce heating by two hours per day, preserving occupants’ comfort and saving energy at the same time.

“We empower companies with the data they need to reduce their building’s energy usage, overlapping multiple data sets to identify hotspots and opportunities for reduction,” says Grant. “This enables

them to reduce their emissions by up to 25 percent, so they can reach their sustainability targets and comply with ESG regulations.”



Interview by
[Alice Chambers](#).
First published in
Issue 24 of the
[Microsoft Technology](#)
[Record](#).

ESG predictions

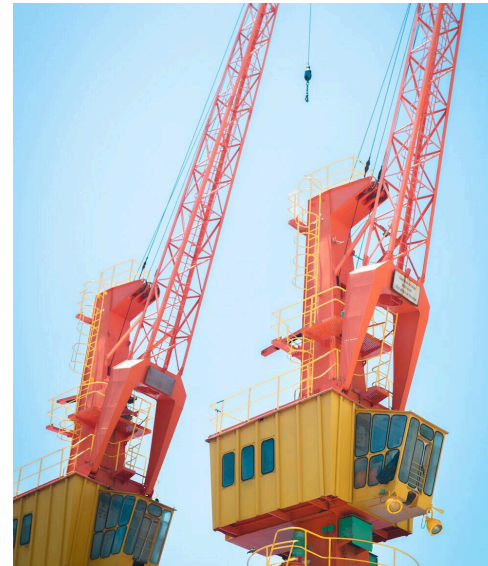




Over the past decade ESG has moved from the fringe of attention (outside of corporate circles) to the center spotlight for not just corporations, but the nations in which they operate and the global public that makes their business possible. Those who Design, Build and Operate buildings today dedicate more headspace than ever before to human health/wellness and environmental sustainability. If I were to 'bet' on any trend at the intersection of the Internet of Things and Real Estate,

it would be tech-enabled building operations tools that enable companies to have their best people, managing their buildings at maximum efficiency, all-the-time, from wherever those experts may be. PropTech that lets world-class engineers avoid battling through traffic to multiple buildings to meet vendors bidding on ECM's or addressing technical issues, will offer the irresistible one-two punch of 'Quality of Life' in the battle for that talent, alongside 'Sustainable Efficiency' in the way that time, fuel and energy must be deployed.

These tools are going to be the substance of the 'metaverse', whatever that term comes to mean: the 1's and 0's that are the virtual doppelgangers of the molecules in which we live, work and play. As a Green Building professional, when I'm doing a commissioning walkthrough, I want to hand my



client more than just a PDF report no one will ever read. I want to hand them a Digital Twin that lets their team see not only where something needs to be fixed today, but where even the management team of the next owners can look for opportunities or issues five years down the road that help them succeed in decarbonizing, in making a healthier, more equitable space. That Digital Twin and the

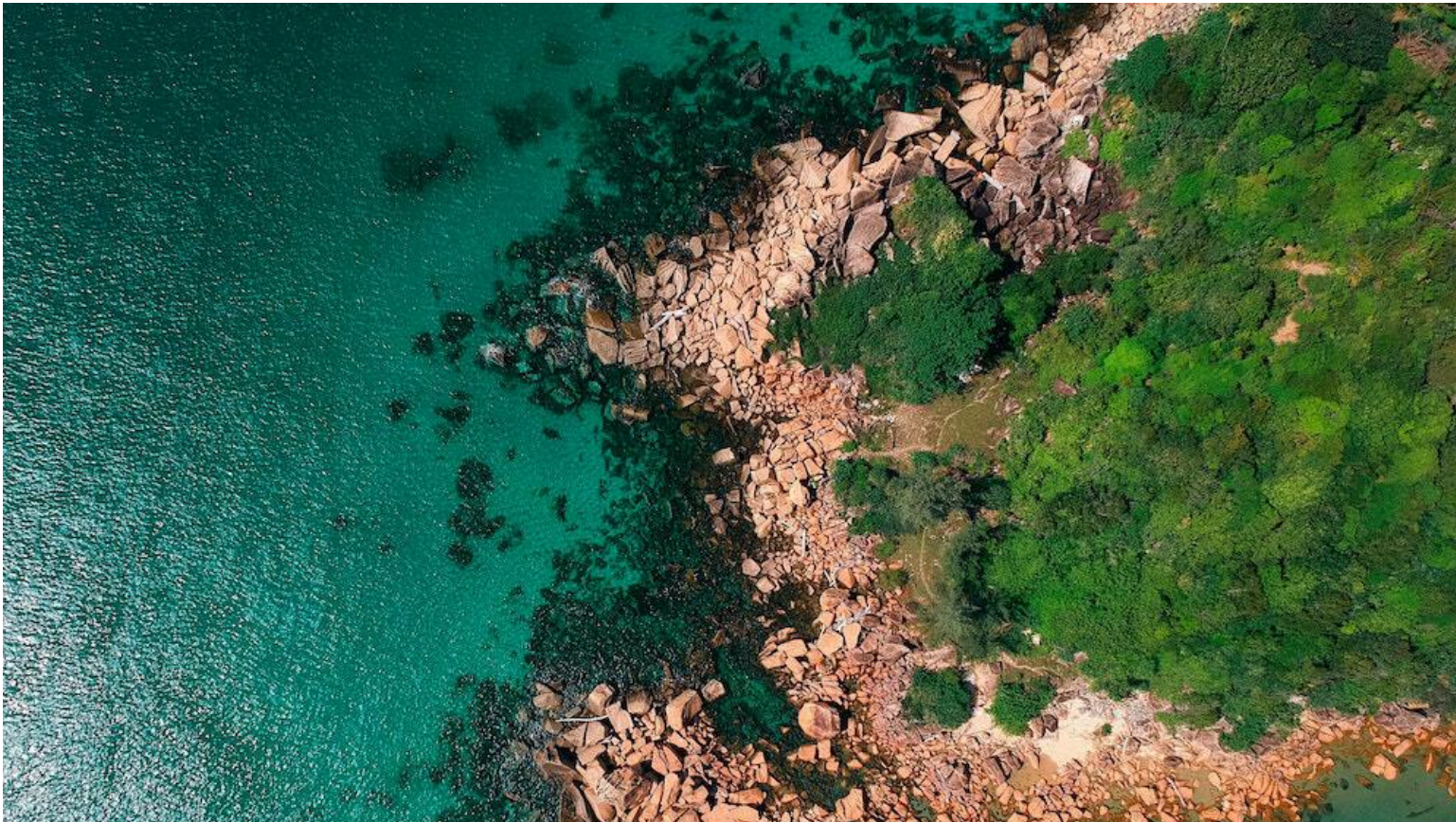


If I were to 'bet' on any trend at the intersection of the Internet of Things and Real Estate, it would be tech-enabled building operations tools that enable companies to have their best people, managing their buildings at maximum efficiency, all-the-time, from wherever those experts may be.

Charlie Cichetti, CEO & Co-Founder of the Sustainable Investment Group



property technology inside it becomes a real asset, one that is appreciating in value along with the physical building; a digital asset yes, but it's no less real. That's where we are going to see PropTech become inextricably intertwined with success in ESG.



Looking forward to how companies will approach ESG in the future, I think we will see two major changes that create the impact we need to see for people and the planet. The

first is making ESG measurement quantitative rather than qualitative as they mostly are today. The second is companies using this measurement to differentiate. The

companies that can productise their purposeful activity and compete on an emotional level will win out in the long term.

“

The companies that can productise their purposeful activity and compete on an emotional level will win out in the long term.

Jimmy Cockerton, UK Business Strategy Manager at Microsoft

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ESG will continue to evolve rapidly, with new standards, understanding and acronyms entering the vernacular at pace. As science deepens our insights and technology offers optionality, the field will become increasingly complex in the short-term, before enhanced legislation brings focus and motivation in the mid-term.

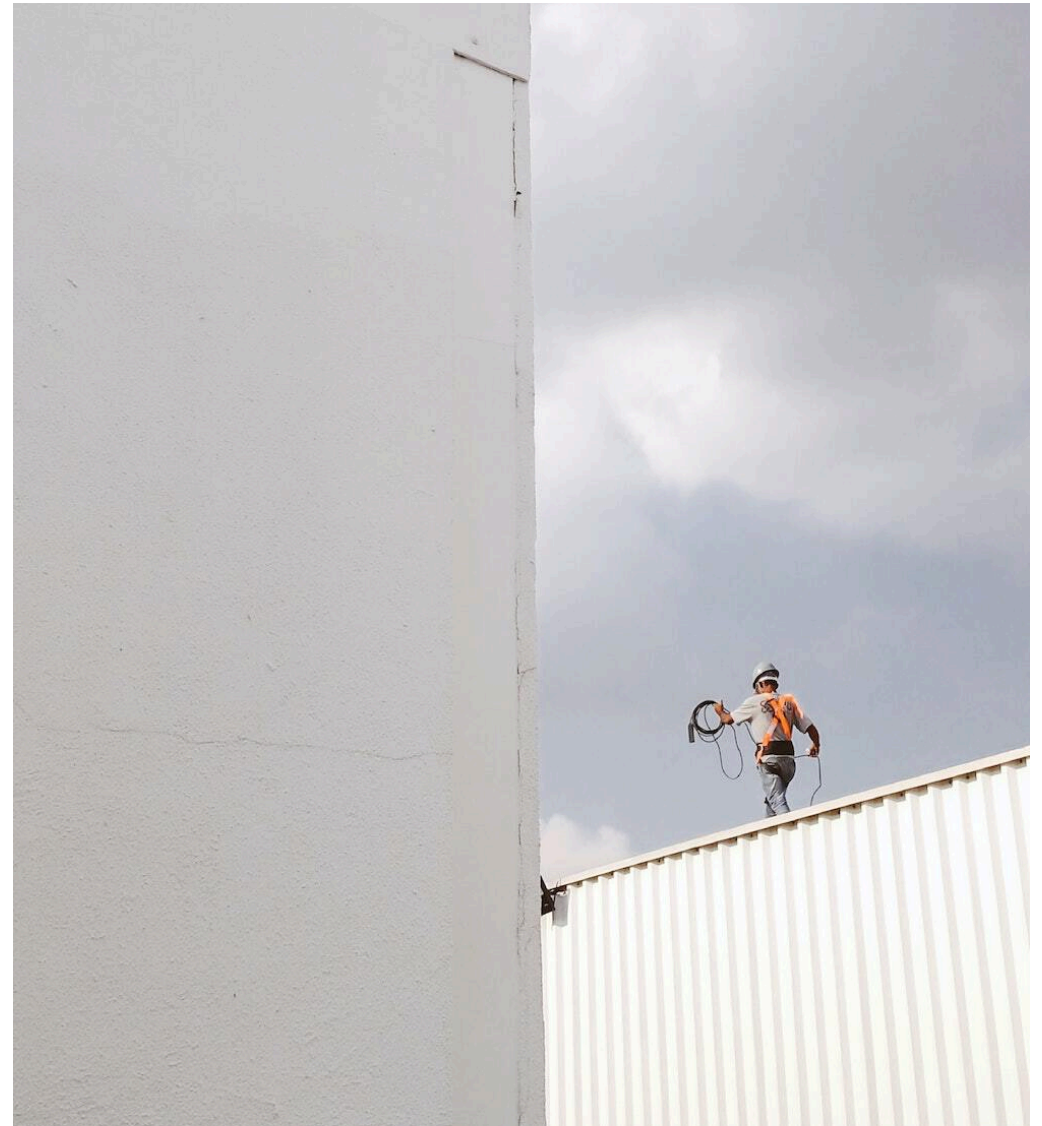
I'm also expecting to see greater refining and reporting of more indicators across the ESG

“
ESG will continue to evolve rapidly, with new standards, understanding and acronyms entering the vernacular at pace

Hettie Cust, Strategic Projects
Manager at Gerald Eve LLP

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spectrum. Often it's more straightforward to report improvements in the environmental aspect, for example in our Head Office at One Fitzroy we measure air quality every 3 months to ensure standards remain high, but I expect PropTech will evolve to increase accountability of social and governance measures to deliver material differences in all three spheres.





I think over the next couple of years there will be big changes in regulation and legislation – this might be at state level, local government level, or country level.

[Michael Grant](#), COO at Metrikus



I think over the next couple of years there will be big changes in regulation and legislation – this might be at state level, local government level, or country level. Companies will have no choice but to comply – until this point, some companies may still drag their heels with ESG, which is already something we've seen in our market.

I also think new joiners or tenants will have bigger expectations for companies to have clear ESG strategies in place. People want to see and understand how exactly this is being rolled out and what goals are being hit, and it will be a bigger part of the decision-making process for prospective employees. Any businesses that lack transparency might notice it impacts their recruitment efforts.





Good quality data will continue to play a key role in ESG, particularly as we now have commonly adopted tools like the Carbon Risk Real Estate Monitor (CRREM), which gives context to the metrics that have been reported, allowing investors and portfolio managers to interpret them in a more meaningful way.

Andres Guzman, Senior Director | Head of ESG – Europe at Tishman Speyer.



The drive to price a wider set of ESG risks together with rising pressure for more accountability and greater regulatory scrutiny will increase the demand for more credible disclosure. Climate risks are currently being assessed based on global or regional models making it tricky for the market to price that risk at the asset-level. In the next two to three years, I think we'll see a massive shift towards better resolution in climate risk tools, more specific to assets.

Good quality data will continue to play a key role in ESG, particularly as we now have commonly adopted tools like the Carbon Risk Real Estate Monitor (CRREM), which gives context to the metrics that have been reported, allowing investors and portfolio managers to interpret them in a more meaningful way.



When it comes to regulation, I think that the implementation of the EU Taxonomy and the Sustainable Finance Disclosure Regulation (SFDR) will have a big impact, as they will effectively force asset owners and managers to apply the concept of double materiality. This will increase transparency and help the sector understand the real impact that real estate funds are having.

ESG rating platforms will also start to align more with natural boundaries. We are already starting to see this shift, with collaborations between companies like GRESB and CRREM. In the coming years, other ratings and standards will follow suit, broadening the scope to include aspects like materials and water usage.

Finally, I think we will see an increased focus on measuring and reducing Scope 3 emissions. Currently, there is a great deal of estimation being used, but we have the tools we need to progress towards measuring and reporting across all emission scopes in a more accurate way.



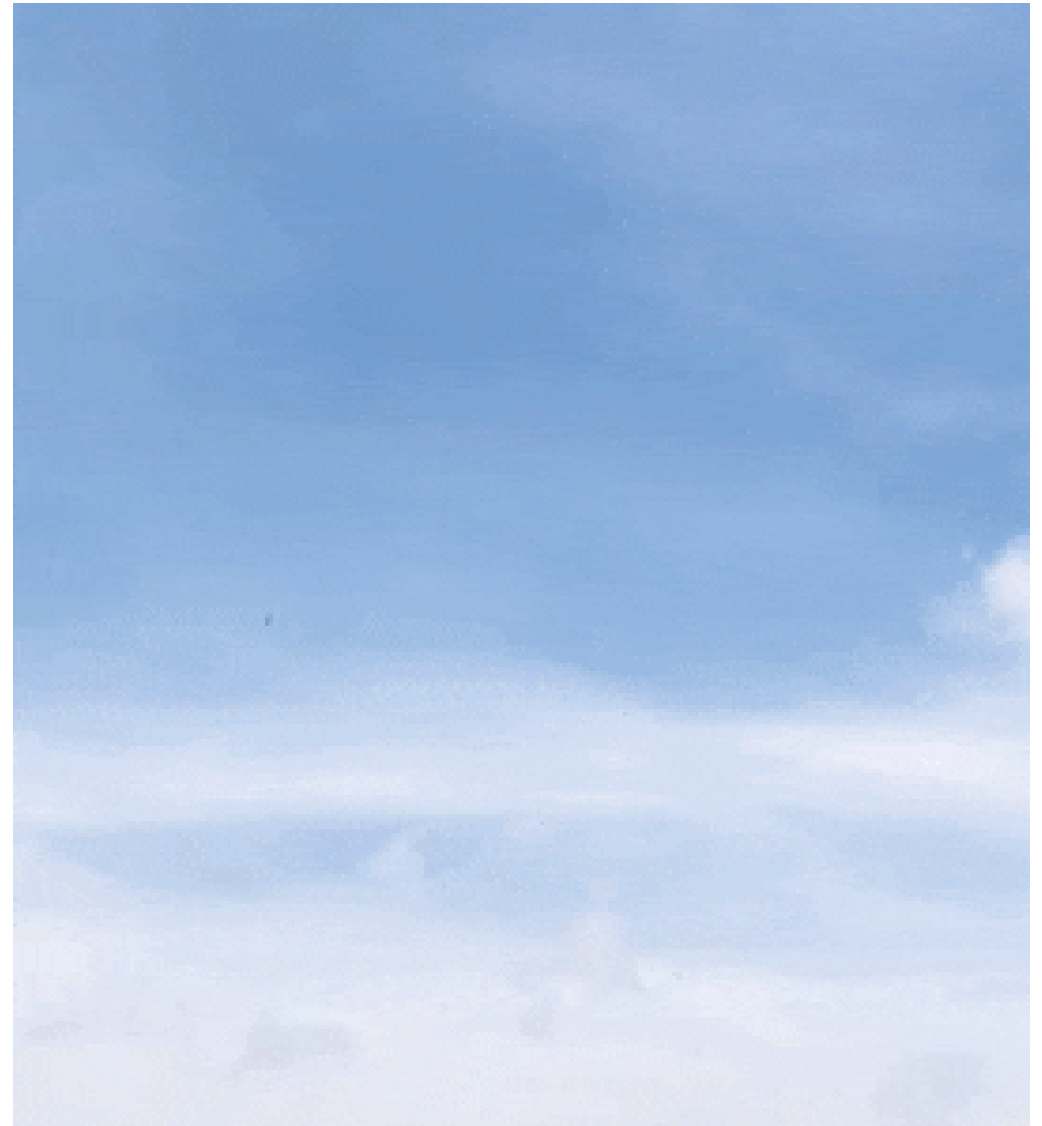
I hope that each stakeholder will be able to see for themselves how taking action to save money can also have a positive impact on reducing carbon emissions, and vice-versa.

Sophia Kesteven, General Manager at Tech Zero



I think the current energy crisis in the UK could be a catalyst for businesses to really hone in on their energy use; refining their energy management and taking action to become much more energy efficient.

I think many companies will look to become more self-sufficient, such as by installing solar panels on office buildings or warehouses, alongside energy storage technology. This will take strong partnerships and collaboration, especially within shared workspaces, but I hope that each stakeholder will be able to see for themselves how taking action to save money can also have a positive impact on reducing carbon emissions, and vice-versa.





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In particular we see that Building Energy Management solutions combined with occupancy monitoring and lighting controls are enabling customers to better monitor, predict and manage energy usage.

James Lockyer, IoT Sales and Marketing Leader at Microsoft



With multiple market dynamics today influencing customer requirements we predict that we will see an increase in demand for smart building solutions to help reduce energy usage and costs as well as support company ESG initiatives. In particular, we see that Building Energy Management solutions combined with occupancy monitoring and lighting controls are enabling customers to better monitor, predict and manage energy usage. By doing so, customers are realizing the benefits of reducing their energy usage by up to 25% today; this has the added benefit of also reducing energy costs. We expect to see the convergence of company strategies and budgets here – with Building Energy Management deployments linking directly to reducing operational emissions, which is a core sustainability strategy for most customers.

Shareholders, investors and consumers are closely watching what steps companies are taking to meet ESG goals and support the transition to net zero, with many organizations linking their smart building projects to their sustainability annual reports and meeting disclosure requirements, such as the Task Force for Climate Related Financial Disclosures (TCFD) – which has been mandatory for UK listed companies with more than 500 employees since April 2022. Having the ability to record and report all emissions across Scope 1, 2 & 3 categories centrally using a common data model, and being able to demonstrably take steps to reduce emissions, will also accelerate.



According to CIBSE figures, one faulty sensor on an item of plant increases the running cost of that device by a minimum of 10%.

James Palmer, Head of Pre Sales and BMS at Metrikus



I predict that FM departments will get increased budgets to maintain building management systems and HVAC plants. According to CIBSE figures, one faulty sensor on an item of plant increases the running

cost of that device by a minimum of 10%. Years of underinvestment in these areas from all sorts of businesses is now being realized as people begin to feel the real cost of inaction.

I think estate managers will be held to greater account by ESG departments as these teams grow within larger businesses. They'll have to prove the efficiency of their estate and adopt software to demonstrate that they're actually making a difference.

We can also expect to see more discussions about building efficiency at C-suite level. Heads of businesses will want to understand space utilization, energy efficiency and comfort levels for staff, in order to promote their company to a more discerning, better educated and far more demanding customer base. The same is true for HR departments trying to attract and retain top talent. They will need to prove their business is sustainable and safe to work in.



As organizations normalize data and buildings become more connected across the portfolio, gamification will be used to drive positive employee behavior in recycling, power savings...

**Michael Przytula, Managing Director
- Intelligent & Digital Workplaces at
Accenture**



Organizations will aggregate data across traditional enterprise silos surfacing correlations between building measures and workplace efficiencies. For instance, the combination of occupancy and air quality metrics can provide insights for the optimization of power consumption. As organizations

normalize data and buildings become more connected across the portfolio, gamification will be used to drive positive employee behavior in recycling, power savings, etc.

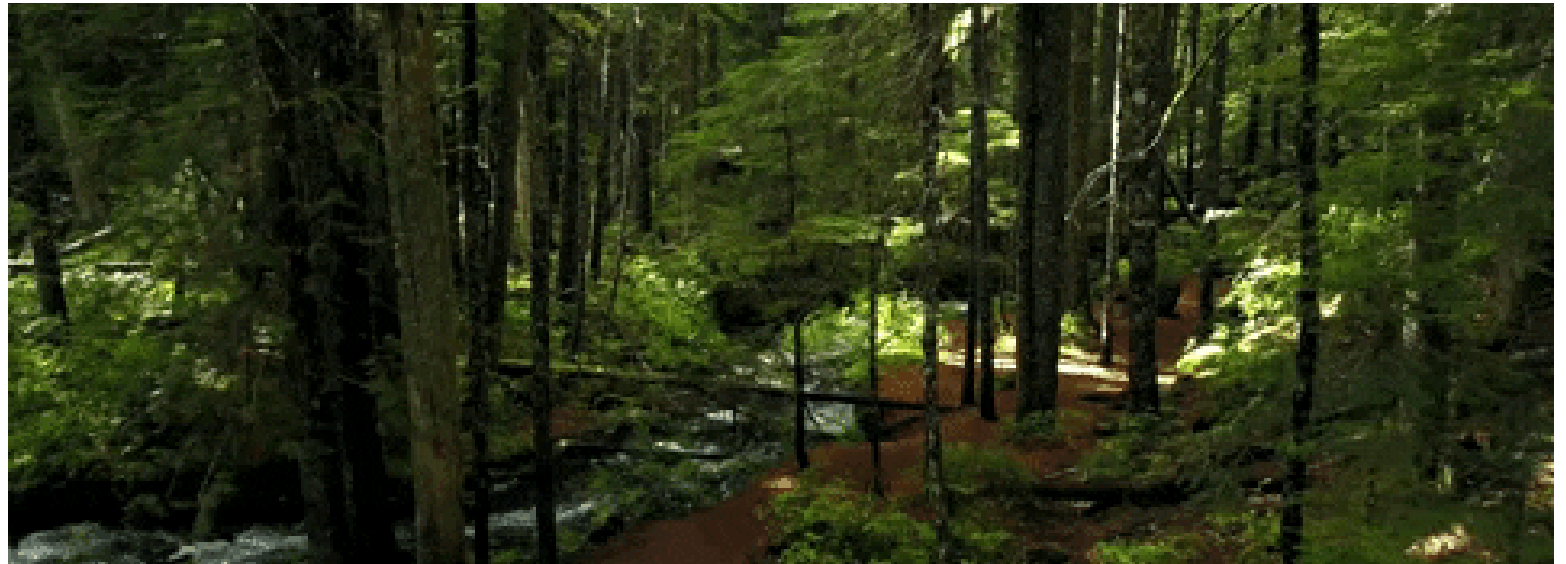
We will see the rise of friendly competitions between teams, facilities, and geographies that

encourage not only meeting, but exceeding sustainability targets with positive reinforcement. This will create persistent momentum in organizations as employees and leaders witness the cumulative impact of their individual actions on ESG goals.

In the coming years, we will see ESG regulations continue to accelerate amid significant global challenges.

ESG will evolve into the implementation phase for big corporations, but challenges will remain when it comes to small and medium-sized enterprises (SMEs), which are the backbone of Europe's economy and account for 99% of all businesses in the EU, UK and US.

Technology and climate tech will become key for ESG execution, and we will see an increase in the quality of ESG data. Greenwashing will become a risk too expensive to run and Boards will become more ESG conscious.



Technology and climate tech will become key for ESG execution, and we will see an increase in the quality of ESG data. Greenwashing will become a risk too expensive to run and Boards will become more ESG conscious.

Susana Quintás, Senior Advisor for Metrikus Spain and Latam





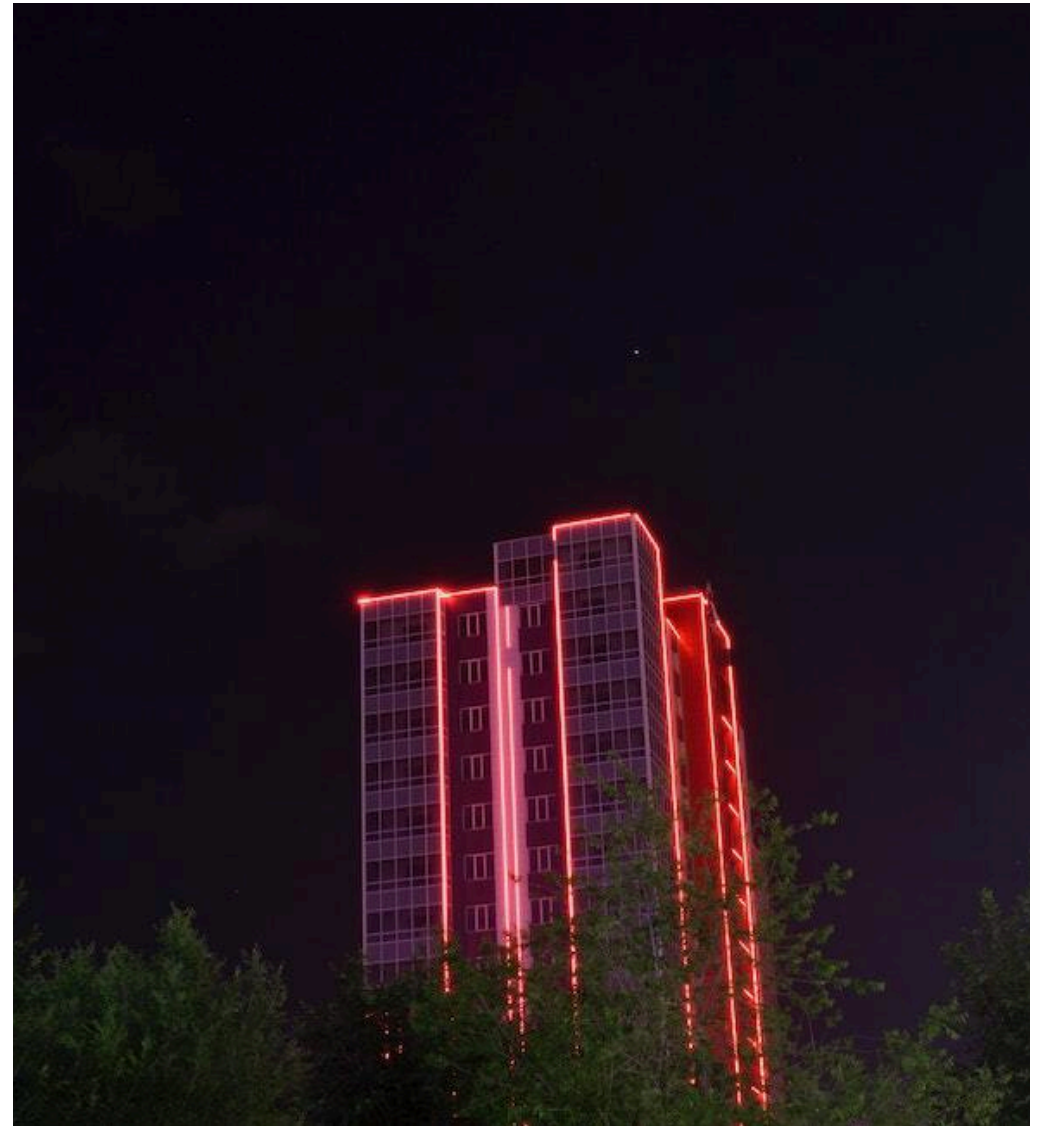
In the coming years, the real estate industry will further accelerate its work to decarbonize. Already ESG is no longer a check-the-box exercise, it involves a holistic company-wide commitment that runs deep through a portfolio.

And looking ahead, pressure for more transparency and accountability will come from stakeholders across the real estate value chain – investors, governments, occupants, communities – which will only increase the importance and seriousness in which sustainability is addressed.



Already ESG is no longer a check-the-box exercise, it involves a holistic company-wide commitment that runs deep through a portfolio.

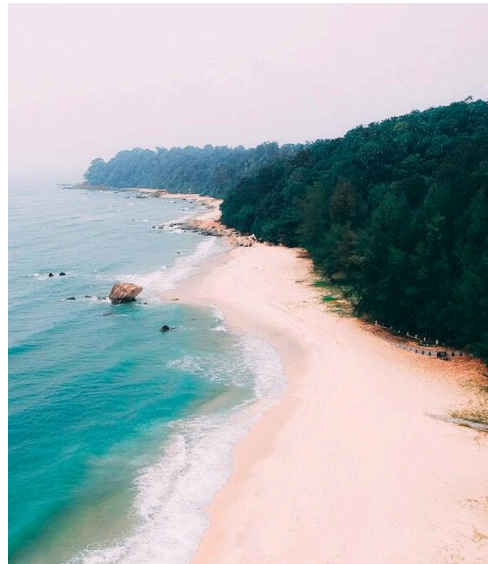
**Marta Schantz, Co-Executive
Director, ULI Randall Lewis Center
for Sustainability in Real Estate**



The drivers and incentives for ESG reporting have increased rapidly in the last 10 years and that trend is only set to continue, with reports suggesting that ESG assets will tip \$30 trillion by 2030.

Businesses of any size, in any sector and in any geography are now being requested to provide their ESG and sustainability credentials by multiple stakeholders. Being able to demonstrate that you can measure, manage and report your sustainability is now an essential part of future-proofing your business.

Investors are becoming savvier and are demanding more valuable insights and greater intelligence on whether companies are not only mitigating any negative impact created by their business operations but also creating positive impact in the communities where they operate, and where they sell



and source. Traditionally most ESG measurement models were based on negative screening, where the onus is on proving your business is not doing anything bad. Now the focus is on impact reporting, which is being able to report, preferably in a quantitative way, the good your business creates.

In addition to this, there is a push towards a broader definition of



Now the focus is on impact reporting, which is being able to report, preferably in a quantitative way, the good your business creates.

Alexandra Smith, Co-Founder of The Sustainability Group



ESG reporting in 2022 and beyond should be based on measuring both current progress and future ambition, setting timeframes and ensuring accountability for the targets and improvements you have committed to.

It is most important to measure what we value, analyze it, communicate it and have a positive intent to do better.

Acknowledgements



We'd like to say a huge thank you to our contributors:

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- Michael Przytula, Managing Director – Intelligent & Digital Workplaces at Accenture
- Marta Schantz, Co-Executive Director, ULI Randall Lewis Center for Sustainability in Real Estate
- Alexandra Smith, Co-Founder of The

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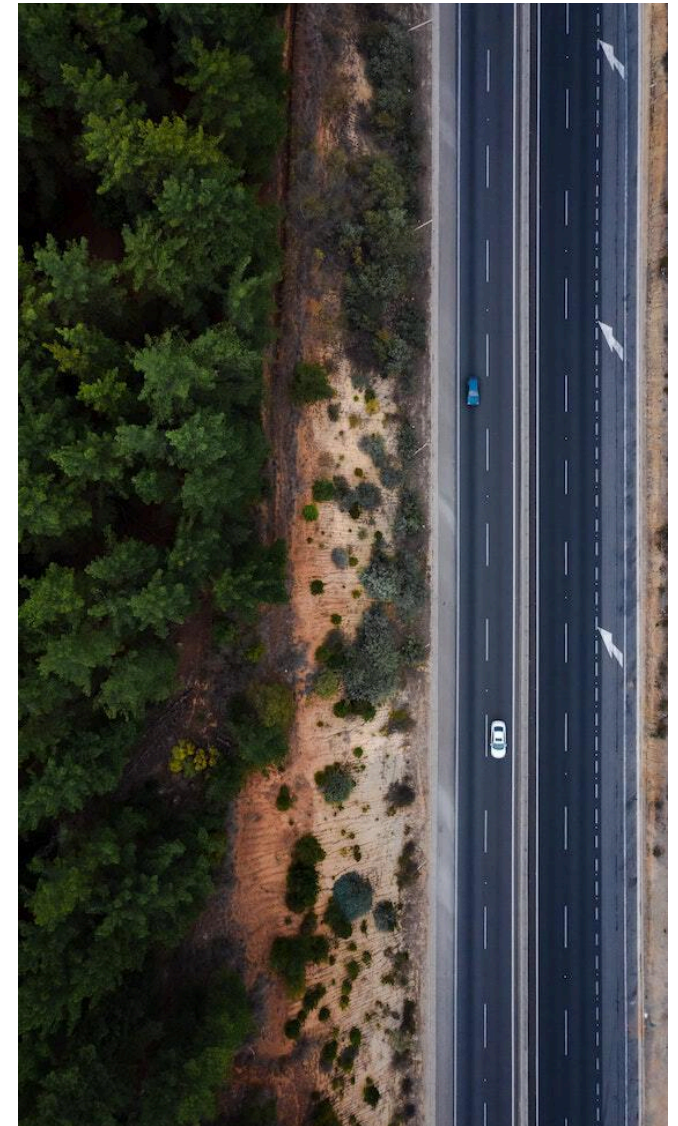
Get in touch

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

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Thank you for reading

