

Sustainability trends

2024

Foreword

by Lubomila Jordanova,
CEO and Co-founder of Plan A

Reflecting upon COP28, a defining moment in our collective response to climate change, it is clear that the path forward is both challenging and filled with opportunity. The discussions here at the summit underscore the critical need for a seismic shift in how businesses approach sustainability. This paper, "Sustainability Trends 2024", is an endeavour to chart that course.

We are at a juncture where the policy landscape resembles a minefield, complicated yet navigable with informed strategy and innovative thinking. As leaders, we are called upon to steer our organisations through this labyrinth, not just to comply with emerging regulations but to redefine what it means to do business in a decarbonised economy. The commitment to low-carbon business models and making net-zero business-as-usual is no longer a distant goal but an immediate imperative.

At COP28, the theme of energy transition has been central, emphasising the urgency of shifting towards a sustainable and low-carbon future. The Global Cooling Pledge and the U.A.E. Declaration on Sustainable Agriculture,

Resilient Food Systems and Climate Action, are a testament to the global community's desire to address these challenges. However, national net-zero targets covering 88% of global greenhouse gas emissions are yet to fully integrate concrete plans for phasing out fossil fuels. This gap between ambition and action is where businesses can step in, bridging it with science-driven strategies and bold commitments.

In this context, technological solutions emerge as a beacon of hope and practicality. They enable us to engage stakeholders effectively, particularly in supply chains, fostering transparency and accountability. By leveraging data and cutting-edge technology, we can monitor and manage our environmental impact with unprecedented precision, transforming the way we operate and interact with the world around us.

Moreover, as the conference has reiterated, moving beyond greenwashing and carbon offsetting is not just a moral choice but a strategic one. Promoting inseting – integrating sustainability into the core of business operations – is a more authentic and impactful

approach. It demands a deeper understanding of our environmental impact and a commitment to internal change, aligning our business practices with the ecological imperatives of our time.

As we reflect on the insights and discussions from COP28, it is evident that the journey towards decarbonisation is as much a scientific endeavour as it is an economic and ethical one. From the UAE's ambitious green finance pledge to the heated debates over fossil fuel phase-out, COP28 has highlighted the complexities and nuances of this journey. It is a path paved with challenges, but also brimming with opportunities for innovation, growth, and leadership.

In conclusion, this whitepaper serves as a guidepost for businesses ready to embark on this critical journey from 2024 and beyond. It is a call to action for informed, science-based decision-making and bold, transformative leadership. As we navigate the uncertainties and opportunities of this era, let us be guided by the knowledge that our actions today will shape the world of tomorrow.

Table of contents

Foreword

by Lubomila Jordanova,
CEO and Co-founder of Plan A:

Introduction

01 The decade of climate disclosure. Are you ready?

02 Low-carbon business models? Making net-zero business as usual

03 Greenwashing scrutiny intensifies

04 Leveraging technology for enhanced stakeholder engagement

Conclusion

Introduction

Limiting warming to 1.5°C and 2°C involves rapid, deep and in most cases immediate greenhouse gas emission reductions

Net zero CO₂ and net zero GHG emissions can be achieved through strong reductions across all sectors

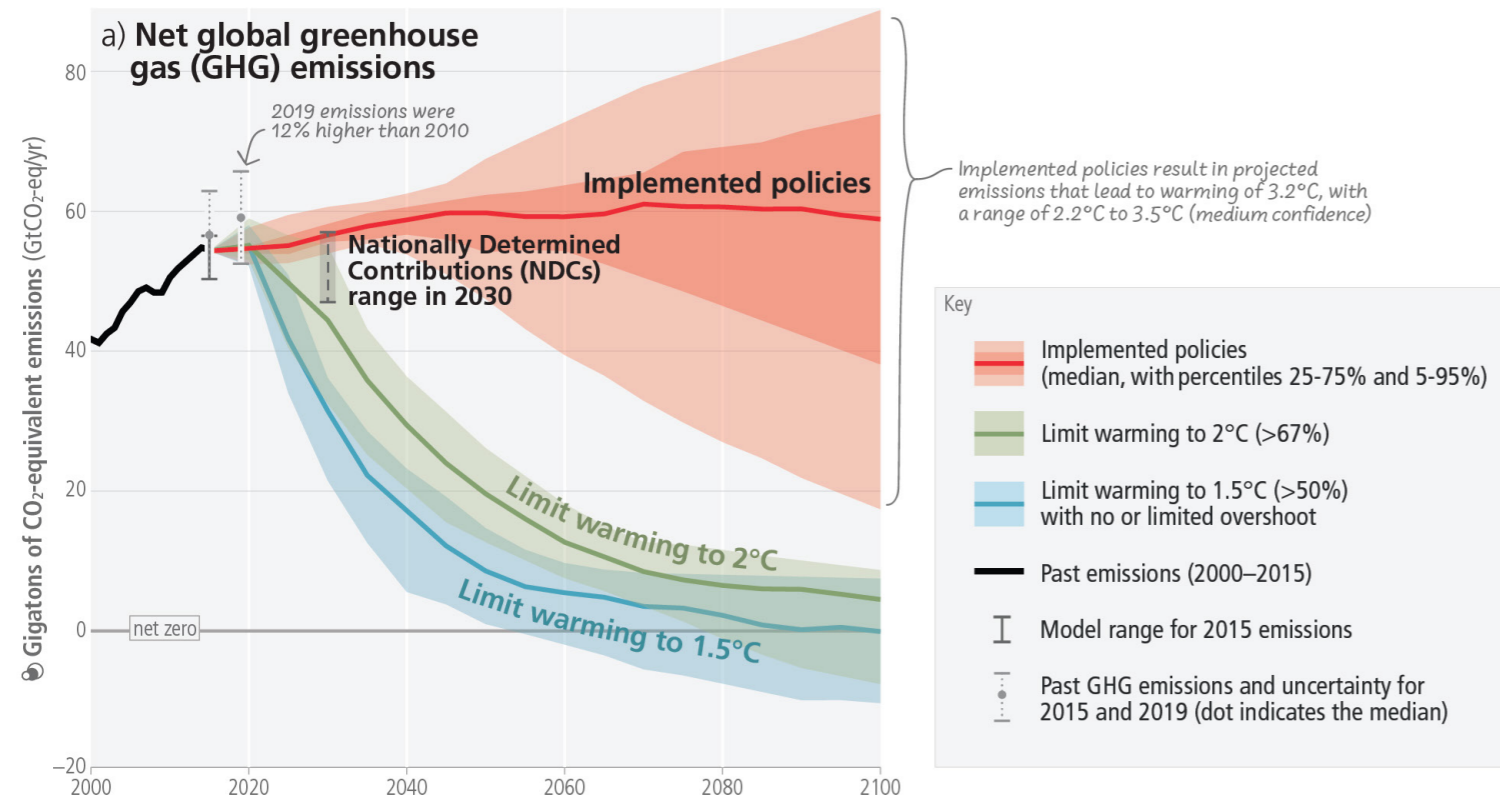


Figure 1. Figure SPM.5: Global emissions pathways consistent with implemented policies and mitigation strategies¹

The latest International Panel on Climate Change (IPCC) report presents a grim reading from an environmental perspective. It showcases the devastating consequences climate change has already had and will continue to have, on the ecosystem and on people's lives¹. Of the 8,000 pages of scientific evidence, the one that stands out is Figure SPM.5.

What does this mean? In short, without corporate sustainability action or government interventions, the planet will experience irreversible change and future generations will suffer the consequences that we are experiencing already. Scientists have confirmed that 2023 is the hottest year on record². Is there a sense of hope within the sea

of despair and what can corporate sustainability contribute to solving one of the most wicked problems society has ever faced? This report summarises four key sustainability trends that are highly likely to materialise in 2024.

Before we jump straight into sustainability, it is impossible to talk about the hype surrounding large language models, such as ChatGPT³ and artificial intelligence (AI). Before exploring the trends and underpinning scientific evidence, we did what many curious minds nowadays would have done – ask ChatGPT. We created a new, clean account with no previous prompts and asked the model what it considered the sustainability trends in corporate reporting would be in 2024.

Our prompt was to consider the perspective of a global management consultancy with clients spanning from fashion to venture capitalists and operations distributed across the globe. The answer was:

- Shifting from linear production to circular production for minimising waste and resources.
- Carbon footprint transparency. Increasing regulatory and consumer demand for transparent carbon footprint disclosure.
- Sustainable supply chain management. Overhauling supply chains to be more sustainable and ensure global coordination.

- Green technology investment. Staying ahead in a rapidly evolving landscape of green technology requires Resource & Development (R&D) and a willingness to embrace new solutions.

How did it compare to the research our internal experts gathered in combination with surveys of industry leaders? Average. It certainly picked up some hot topics that are discussed within corporate sustainability circles and we have seen other 'Trends 2024' articles online based on these exact four principles (nearly verbatim). But it did not offer meaningful insight nor any underpinning evidence to back up the claims⁴. This flaw is understandable as large language models are only as good as their data, the prompts its given, and even then, there is a wide variability in performance depending on how the model is configured⁵. One of the major drawbacks of these technologies, as revealed by a research consortium including Google Mind, is with a budget of \$200 one can extract over 10,000 unique training examples and prompts from these technologies. This process potentially exposes sensitive personal information, such as private conversations, personal identifiers, or confidential documents.⁶

As this paper focuses on sustainability, we will now deep dive into the trends that our team revealed based on primary evidence (interviews with corporate leaders) and secondary evidence (scientific evidence and market research).

¹ https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf

² <https://climate.copernicus.eu/copernicus-november-2023-remarkable-year-continues-warmest-boreal-autumn-2023-will-be-warmest-year#:~:text=Copernicus%3A%20November%202023%20%E2%80%93%20Remarkable%20year,Copernicus>

³ <https://techcrunch.com/2023/12/05/chatgpt-everything-to-know-about-the-ai-chatbot/>

⁴ <https://blogs.library.duke.edu/blog/2023/03/09/chatgpt-and-fake-citations/>

⁵ <https://www.semanticscholar.org/reader/c23d9d44e8bc68408cea9f305d1f24d915bc0d0d>

⁶ <https://arxiv.org/pdf/2311.17035.pdf>

01 The decade of climate disclosure. Are you ready?

As we venture into 2024, companies worldwide are navigating an entire ocean of current and upcoming regulations that also vary depending on size, revenue, and global presence. This complex regulatory landscape coupled with an increase in climate disclosure policies signals a step change in the regulatory cycle. We anticipate a realignment of regulatory pressures, shifting the focus from policymakers to a direct onus on businesses for compliance and accountability.

In response to these scientific findings, global policy development has pivoted sharply towards environmental sustainability. The last three years have seen a doubling of ESG disclosure policies, from 614 in 2020 to 1225 in 2023⁷. This surge is predominantly driven by environmental concerns and carbon emissions reduction strategies in response to IPCC and scientific findings. Critically, it signals a shift that policy is entering a new phase – from passive formulation to active disclosure, evaluation, and enforcement.

Key Dates & Timeline

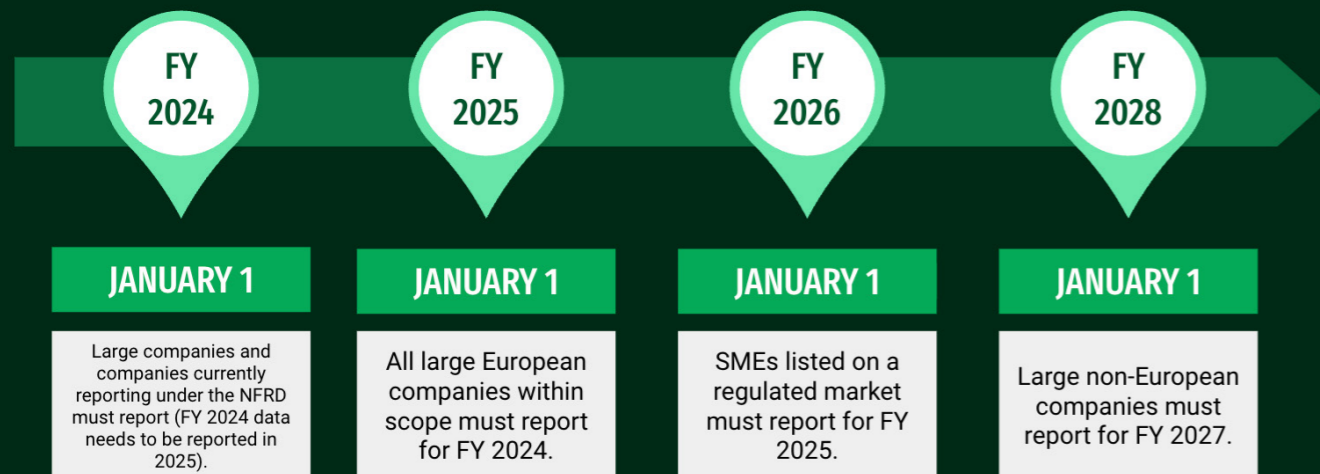


Figure 2. Corporate Sustainability Reporting Directive (CSRD) disclosure

From a corporate sustainability perspective, this means companies have an opportunity to embrace increased ESG disclosure and stay ahead of the curve. This proactive approach prevents the company from facing cliff-edge burgeoning regulatory demands. A study based on 8,369 firm-year observations from 51 countries demonstrates that a proactive approach acts as a mitigation measure as it increases forecast accuracy and reduces potential ESG controversies⁸. Effective climate disclosure becomes not just a compliance strategy, but a critical component of resilient and forward-thinking business leadership.

Finally, the question that dominates board rooms, investor calls and C-level discussions: “Is there a causal link between ESG choices and shareholder value?”. The evidence is rather mixed: one group says “Yes, there’s a \$4 trillion dividend”⁹, a second group claims “Yes, but the actual impact may be modest”^{10, 11}, and a third group says it is “symbolic rather than substantial”¹². To answer this question accurately, we need better alignment and standardisation. Without transparency in methods, inputs and data – our industry will be stuck in an infinite loop of trying to compare apples and oranges.

Standardisation and (mis)alignment

As shown in Figure 1, there are a myriad of policies, standards, and methodologies and

there is an argument that they’re not quite aligned. In the United States, the complexity of disclosure has led to an ideological battle between liberal and conservative states according to a review in the Harvard Law School Forum¹³. Investors point to the standardisation minefield as a weakness and barrier towards ESG-related investments.¹⁴

Why does this matter?

Businesses crave certainty, empirical metrics and data to make decisions. Keeping abreast of the policy, technical, political and science is becoming an increasingly more burdensome task. A survey of more than 1,000 business leaders outlines how making decisions now is statistically harder than it has ever been¹⁵. Companies need a trusted partner that can help guide them on the journey so they can focus on what’s important for them¹⁶: making decisions and ensuring their business grows sustainably. The global race for standardisation and synchronisation is on.

The Carbon Disclosure Project (CDP) to align with International Sustainability Standards Board (ISSB) climate disclosure standard in 2024

The CDP, a global environmental disclosure platform, and the European Financial Reporting Advisory Group (EFRAG) have announced a

⁷ Chalmers, AW, Klingler-Vidra, R, van der Lugt, C, van de Wijs, PP & Bailey, T 2023, Carrots & Sticks: Beyond Disclosure in ESG and Sustainability Policy

⁸ <https://www.sciencedirect.com/science/article/abs/pii/S1057521922003234>

⁹ <https://www.moore-global.com/MediaLibsAndFiles/media/>

MooreStephens2020/Documents/Moore_ESG_White-Paper_FINAL.pdf

¹⁰ <https://link.springer.com/article/10.1007/s11142-022-09701-4>

¹¹ <https://fintech.global/2023/04/21/why-esg-activities-correlate-with-stronger-financial-performance/#:~:text=A%20study%20by%20Bain%20%26%20Company,and%20growth%20for%20private%20firms.>

¹² <https://link.springer.com/article/10.1007/s43979-022-00025-5>

¹³ <https://corpgov.law.harvard.edu/2023/03/11/esg-battlegrounds-how-the-states-are-shaping-the-regulatory-landscape-in-the-u-s/>

¹⁴ <https://www.mdpi.com/2071-1050/14/9/5157>

¹⁵ <https://www.raconteur.net/leadership/why-decision-making-is-more-complex-than-ever>

¹⁶ <https://plana.earth/category/policy-regulations>

" The greatest challenge lies in maintaining a deep commitment and internal leadership to stay accountable to climate goals, even if it necessitates transforming business model pathways. The opportunity arises with the implementation of AI across corporate and climate disclosure data systems and standards. This technology can effectively sort and harmonise stocktaking processes, especially in the realm of mandatory disclosure."



Martin Wainstein
Founder and Executive Director at Open Earth Foundation

collaboration to align CDP's disclosure system with the EU's European Sustainability Reporting Standards (ESRS). This initiative is part of the Corporate Sustainable Reporting Directive (CSRD). The collaboration will focus on accelerating the adoption of ESRS and supporting companies to prepare for new reporting requirements. As we progress through 2024, the ISSB's standards are set to redefine how companies report on sustainability and climate-related matters. The implementation of these standards is a crucial

step towards harmonising sustainability reporting globally, ensuring that stakeholders have access to consistent, reliable, and comparable information.

Task Force on Climate-related Financial Disclosures (TCFD) and International Financial Reporting Standards (IFRS) alignment

Established in 2017 by the Financial Stability Board (FSB), the Task Force on Climate-related Financial Disclosures (TCFD) initially offered voluntary disclosure recommendations to address the fragmentation in reporting frameworks. Following the publication of the IFRS S1 and S2 standards, the TCFD has been integrated into the International Sustainability Standards Board (ISSB).

This integration, requested by the FSB, marks an important step in streamlining sustainability reporting frameworks and simplifying disclosure initiatives for companies and investors. Harmonisation with IFRS S2 standard: One of the notable developments in 2024 is the streamlining between the IFRS S2 Standard and TCFD recommendations. Following the publication of IFRS S2 by the ISSB, there has been a concerted effort to align these standards with TCFD guidelines. This alignment ensures that companies adhering to IFRS S2 will simultaneously be meeting the TCFD requirements for climate-related disclosures from 2024 onwards. Such alignment is crucial in reducing reporting complexity and increasing the consistency and comparability of climate-related financial information across sectors and borders.

Conclusion

The year 2024 stands as a landmark in the journey towards enhanced climate disclosure, the message is clear: companies have an opportunity to take control of their destiny in this rapidly evolving regulatory landscape. The choice is stark – either let the tide of regulation determine your course or proactively steer your business towards resilience and market leadership.

While specialised support like Plan A is invaluable, the diversity of ESG necessitates tailored strategies. Businesses can choose to only be regulation-ready or embrace this challenge and shape the future of sustainable development. Are you ready to take this leap of faith?

02 Low-carbon business models? Making net-zero business as usual

To limit global warming to the critical threshold of 1.5°C, the pace of decarbonisation must accelerate to a rate 11 times faster than what we are currently achieving¹⁷. This means that companies have to transition their operations from simply making net-zero pledges to

actively implementing substantial, low-carbon business models. This approach is fundamental in determining how businesses influence and adapt to the evolving environmental landscape.

“Climate and sustainability are influencing every business, yet it still demands a leap of courage to decide how your company will adapt its business model to satisfy your customers' or clients' needs. For business leaders, taking this leap of faith to discover their role in this industry revolution is both the greatest opportunity and the biggest challenge.”



Steve King
Sustainability Solutions at Visa

Entering the decarbonisation era

2024 marks the beginning of the ‘decarbonisation era,’ a pivotal shift in corporate response to mitigate climate change¹⁸. This era is defined by the implementation of global policies and a structured climate journey for companies, encompassing the five key stages of a company maturity journey: **pledge, disclose, deliver, monitor, and adapt**. This journey is integral to how businesses will shape, or be shaped, by the emerging environmental landscape in the coming years.

The complex nature of pledges and action

The corporate world has seen a significant uptick in net-zero pledges. Over 700 top publicly traded companies, including 59 from the FTSE 100, have committed to net-zero emissions by 2050¹⁹. These pledges, while representing a collective stride towards decarbonisation, also introduce substantial challenges. The urgency to meet stakeholder expectations can turn these commitments into a double-edged sword, especially as deadlines to meet these goals are approaching. This urgency can lead to a rush in reassessing goals, potentially attracting negative media attention and public scrutiny.

The integrity and transparency of these pledges are critically evaluated by organisations like the Corporate Climate

Responsibility Monitor. Only 5 out of 24 companies analysed in their 2023 report were found to be genuinely committed to deep decarbonisation in alignment with their net-zero pledges²⁰. This scenario underscores the inadequacy of relying solely on carbon capture strategies like extensive reforestation. Bloomberg and Oxfam's findings indicate these strategies could lead to an increase of 80% in global food prices due to land constraints²¹.

Moreover, the complexity of these pledges is evident in the struggles faced by businesses in implementing them. For instance, **only 30% of UK businesses have a net-zero strategy**²², and many feel overwhelmed by the necessary steps. Globally, over one-third of the world's largest companies have set net-zero targets, yet most fail to meet basic reporting standards²³.

While making net-zero commitments is an honourable principle, and soon-to-be mandatory policy as outlined in our first trend, the true value and credibility of pledges is backed by sustainable business models.

Carbon accounting, as a discipline, is evolving beyond descriptive analysis of emission recording and evaluation. Concerns about the potential for gaming the system are growing, leading to anticipation of intensified standardisation efforts, as noted by He et al. (2020)²⁴ and Aikman et al. (2023)²⁵. This evolution underscores the importance of disclosure, action, and regular monitoring as fundamental pillars in the climate journey.

¹⁷ <https://www.pwc.com/gx/en/news-room/press-releases/2022/net-zero-economy-index-2022.html>

¹⁸ <https://link.springer.com/article/10.1007/s11301-023-00318-8>

¹⁹ <https://newclimate.org/resources/publications/corporate-climate-responsibility-monitor-2023>

²⁰ https://newclimate.org/sites/default/files/2023-02/NewClimate_CorporateClimateResponsibilityMonitor2023_Feb23.pdf

²¹ <https://www.oxfamnovib.nl/Redactie/Downloads/Rapporten/Fixing-our-Food.pdf>

²² <https://www.gov.uk/government/news/third-of-uks-biggest-companies-commit-to-net-zero>

²³ <https://zerotracker.net/analysis/new-analysis-half-of-worlds-largest-companies-are-committed-to-net-zero>

²⁴ https://onlinelibrary.wiley.com/doi/epdf/10.1111/acfi.12789?saml_referrer

²⁵ <https://www.kcl.ac.uk/business/assets/pdf/research-papers/kbs-research-impact-paper-1-emissions-gaming.pdf>



REAL-LIFE EXAMPLE

The decarbonisation journey is not always straightforward, as illustrated by the experience of Lego. In their pursuit to develop environmentally friendly alternatives, Lego invested two years in creating a new type of plastic. However, this initiative led to an unexpected outcome: the new material resulted in higher overall carbon emissions. This case emphasises the complexities and sometimes counterintuitive results that can arise in the path to sustainability.

“The Lego example is a case study that companies can adopt a scientific approach in their sustainability journey: one of experimenting, sometimes failing, but always transparently moving forward. Science, in its nature, is a story of learning from failure.”



Dr. Dzhordzhio Naldzhiev
Research lead at Plan A

The same principle applies to some decarbonisation initiatives²⁶. Some efforts may fail partially – adding insulation in buildings only decreases carbon emissions in the short term²⁷, because people use the same energy to heat their homes and buy ‘comfort’ (i.e. higher indoor temperature)²⁸. Or in the case of Lego – they may fail²⁹. This example provides

two key lessons: measuring the impact of each action regularly over time is critical and sometimes initiatives go wrong so we need to adapt and be ambitious to reach net-zero.

“The greatest challenge for corporate and real economy stakeholders will be the development of a low/no carbon business model. The transition to a Paris-aligned world will not be easy for many corporations, particularly those in the carbon-intensive sectors. The transition period will be bumpy and many companies will need to completely reinvent their business model. The execution and technology risk presented will be great, however, there is no plan B for a net zero carbon world.”



Michael Sheren
Fellow at Cambridge University Institute for Sustainability Leadership

²⁶ <https://www.frontiersin.org/articles/10.3389/fnins.2019.01121/full>

²⁷ <https://www.cam.ac.uk/research/news/insulation-only-provides-short-term-reduction-in-household-gas-consumption-study-of-uk-housing>

²⁸ <https://www.ucl.ac.uk/bartlett/energy/energy-use-uk-building-stock-new-empirically-based-models>

²⁹ <https://theconversation.com/legos-esg-dilemma-why-an-abandoned-plan-to-use-recycled-plastic-bottles-is-a-wake-up-call-for-supply-chain-sustainability-214573>

“Companies globally are balancing two competing priorities: a market pushing them towards greater profitability against customers and regulatory pressure to demonstrate progress towards net-zero. Soon I believe these two priorities will fully align and the market will heavily reward the companies that took proactive steps to measure and start on the decarbonisation journey.”



Paul Murphy
Partner at Lightspeed Venture Partners

Strategies for effective decarbonisation

Overcoming the gap between intention and action requires a shift from traditional linear business models towards more sustainable, circular, ones. For example, companies reliant on extraction and depletion of resources are encountering greater challenges in transitioning to new operating models.

For instance, circular business models in the fashion industry could generate a \$560 billion economic opportunity. Practical examples from the fashion industry³⁰ include:

- Rainwater harvesting systems used in the manufacturing process
- Using innovative dyeing techniques
- Substituting high-carbon with low-carbon materials (leather → cotton)
- Eliminating single-use plastics and using recycled materials for packaging

Another innovative case study is leveraging waste heat from data centres to reduce the heating demands of homes³¹. Pilots for this effort already exist on a local level where a UK pool is heated by a mini data centre³², and Amazon, Facebook, Microsoft and Apple have already invested in similar projects³³.

As companies navigate the challenging yet opportunistic landscape of 2024, the transition to low-carbon business models emerges as both a necessity and a strategic advantage. While progress is being made in reducing direct emissions, addressing Scope 3 emissions across supply chains remains a challenge. Collaborative approaches with SMEs are essential for effective reductions in these indirect emissions³⁴.

Conclusion

2024 emphasises a crucial juncture in corporate sustainability efforts. This period demands a shift from mere net-zero pledges to the actual implementation of impactful, low-carbon business models. The journey, marked by challenges and opportunities, involves not just compliance but innovation in sustainable practices.

Companies are now exploring transformative approaches, such as circular business models and innovative technology, to align profitability with sustainability. The path is complex and requires resilience, but it presents an unparalleled opportunity for businesses to lead in the decarbonisation era. In essence, 2024 is a year of action and adaptation for businesses, challenging them to not only meet their net-zero commitments but to be trailblazers in sustainable development. Will you rise to the occasion and set a precedent for a sustainable, net-zero future?

³⁰ <https://www.sciencedirect.com/science/article/pii/S2772390922000130>

³¹ <https://www.gov.uk/government/news/thousands-of-homes-to-be-kept-warm-by-waste-heat-from-computer-data-centres-in-uk-first>

³² <https://www.bbc.co.uk/news/technology-64939558>

³³ <https://www.greenbiz.com/article/data-center-warms-homes-waste-heat>

³⁴ <https://www.cdp.net/en/articles/supply-chain/4-steps-for-reducing-scope-3-emissions-and-accelerating-action-through-your-supply-chain>

03 Greenwashing scrutiny intensifies

As we advance into 2024, companies are required to transcend the practice of greenwashing worldwide, with specific greenwashing regulations being implemented in the EU³⁵, UK³⁶ and the US³⁷. Responsible business leaders must adopt a comprehensive and transparent sustainability approach that is both genuine and legitimate. Stakeholders are increasingly insistent on a sincere commitment to sustainability, necessitating a departure

from superficial gestures³⁸. Shifting beyond conventional carbon offsetting towards carbon insetting³⁹, coupled with the integration of life cycle assessments, amplifies an organisation's transparency. These strategic measures are anticipated to play a pivotal role in the evolving landscape of sustainability practices, indicating a broader industry movement towards authentic and impactful environmental stewardship.

Greenwashing is a deceptive tactic used by companies to mislead stakeholders into thinking that their environmental efforts are more significant than they are. This misrepresentation is not only misleading but can also harm a company's reputation, damage customer trust, and ultimately hinder progress towards a sustainable future⁴⁰.

Greenwashing laws: Time for full transparency

The struggle against greenwashing is expected to intensify in 2024, spurred by heightened regulatory scrutiny. Companies will face increased pressure to provide full transparency, particularly due to the evolving legal landscape. The European Union has taken a bold step by prohibiting greenwashing and climate-neutral assertions by 2026⁴¹, and companies could now face potential penalties of **up to 4% of their annual revenue** for making misleading environmental claims.

The Green Claims Directive is a regulatory framework that outlines explicit guidelines mandating companies, irrespective of their origin, to adhere to stringent criteria when articulating environmentally friendly assertions. These guidelines encompass substantiation prerequisites, prohibitions against deceptive claims, and the utilisation of standardised environmental labels for all products and services marketed within the EU. Non-compliance may result in fines, sanctions, and product recalls. The proposed directive necessitates independent verification and

scientific substantiation for covered green claims, with oversight by autonomous bodies under the jurisdiction of EU member states. This requirement extends to companies outside the EU that target European consumers with green claims.

IFRS S1 and IFRS S2 standards issued by the International Sustainability Standards Board (ISSB) set uniform sustainability and climate standards for companies to follow globally from 2024⁴². The introduction of such standards mitigates the harm associated with poor data quality and lack of common standards which previously allowed companies to overstate their climate credentials, or 'greenwash'.

Companies are anticipated to undertake substantial revisions to their marketing methodologies, to fortify themselves against potential allegations of greenwashing. The foreseeable consequences, inclusive of potential customer and investor attrition and potential harm to brand reputation, underscore the imperative for enterprises to abstain from engaging in deceptive practices.

³⁵ <https://www.europarl.europa.eu/news/en/press-room/20230918IPRO5412/eu-to-ban-greenwashing-and-improve-consumer-information-on-product-durability>

³⁶ <https://www.fca.org.uk/news/press-releases/fca-proposes-new-rules-tackle-greenwashing>

³⁷ <https://www.globalpolicywatch.com/2023/05/the-green-claims-global-drive-developments-in-the-uk-us-and-eu/>

³⁸ <https://www.clientearth.org/what-we-do/priorities/greenwashing/>

³⁹ <https://plana.earth/glossary/carbon-insetting>

⁴⁰ <https://plana.earth/academy/how-eu-greenwashing-regulations-impact-business>

⁴¹ <https://plana.earth/academy/how-eu-greenwashing-regulations-impact-business>

⁴² <https://www.ifrs.org/news-and-events/news/2023/06/issb-issues-ifrs-s1-ifrs-s2/>

“As reporting already gears towards normalisation, companies can take this opportunity to revisit their entire value chain to seek optimisation and innovation: it is not every day that companies are building a summary of how they build and operate their business. This introspection can represent a good time for companies to investigate what they could do better, for their customers and shareholders, while improving the outcome for the planet.”



Thibaut Schlaeppli,
Founding Managing, Director Opera Tech Ventures

Ways to avoid greenwashing

01 Transparency and accountability

One crucial aspect of circumventing greenwashing involves transparent communication and accountability. Organisations must provide clear and accurate information regarding their sustainability efforts. Third-party certifications and independent audits play a pivotal role in verifying and substantiating claims and instilling confidence in stakeholders. This approach ensures that sustainability is not just a marketing strategy but a genuine commitment backed by concrete actions.

02 Life Cycle Assessments (LCAs)

Employing LCAs is another pivotal strategy for avoiding greenwashing. These assessments analyse the environmental impact of a product or service throughout its entire life cycle, from raw material extraction to end-of-life disposal. By embracing LCAs, organisations gain a comprehensive understanding of their environmental footprint, allowing for informed decisions and targeted improvements in sustainability practices.

03 Integration of sustainable practices

To combat greenwashing, companies must integrate sustainability into their core business operations. This involves adopting sustainable practices not only in the final product but also in the supply chain, production processes, and distribution networks. This holistic approach ensures that sustainability is deeply embedded in the organisation's DNA, fostering a genuine commitment that goes beyond surface-level claims.

Offsetting under the spotlight

Offsetting has had a long and controversial history. On one hand, it offers companies a quick and easy way to 'virtually' reduce their emissions. Research in the prestigious Nature Journal reveals some projects may not causally reduce emissions by the amount claimed⁴³. Other 'offsetting' projects were selected despite there being a high likelihood they would've been funded anyway even without the 'offset' fund⁴⁴. In the worst-case scenario, such as the Ugandan National Park, offset projects not only failed to deliver the promised carbon savings but also potentially contributed to local conflicts and violence⁴⁵.

There is a role for carbon offsetting, including support for nature-based solutions, but only if implemented properly and evaluated holistically and longitudinally. This means measuring the impact of those efforts rather than a 'set and forget' mentality. For instance, technological advancements and secure data transfers provide a solution for companies to automate processes, despite requiring resources. Seddon (2022) provides examples of both good and bad case studies of nature-based solutions in their recent peer-reviewed study⁴⁶.

Let's consider an analogy involving water companies to better understand the impact of corporate environmental responsibilities. Imagine your closest friends, relatives, colleagues or other close ones regularly swimming in the nearby lake. Would you prefer that the water company (Company A) located near the lake to:

- a Clean the sewage water before dumping it directly into the lake or not to dump sewage water into the lake at all
- b Pay \$5000 to Company B to clean a lake in a different country, but then not follow up and check whether Company B has done that

The same principle applies to carbon accounting. Offsetting is much more straightforward for businesses as it involves mostly desktop searches and due diligence: for example, paying thousands to consultants to advise on whether you should pay the \$5000 to Company B or Company C⁴⁷. However it may simply 'wash' the problem away without having any meaningful impact on the world. There is space for offsetting, but a big trend emerging is the discussion, and scrutiny, of how prominent it is part of companies' corporate sustainability strategies.

Alternatively, Company A could investigate how they can take ownership of the problem and engage the local community to collectively resolve it (in the water analogy case, a scandal has already materialised in the UK)^{48,49}. To avoid similar problems going forward, there are alternative options.

Carbon Insetting

Reducing emissions should always take precedence as the primary objective. Carbon insetting has emerged as a forward-thinking strategy, prioritising internal initiatives within a

⁴³ <https://www.nature.com/articles/s43247-023-00984-2#Sec2>

⁴⁴ https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3950103

⁴⁵ <https://www.sciencedirect.com/science/article/pii/S001671851400147X>

⁴⁶ <https://www.science.org/doi/full/10.1126/science.abn9668>

⁴⁷ <https://www.offsetguide.org/avoiding-low-quality-offsets/conducting-offset-quality-due-diligence/#:~:text=Offset%20project%20due%20diligence%20can,you%20are%20acquiring%20offset%20credits.>

⁴⁸ <https://www.bbc.co.uk/iplayer/episode/m001t4g5/panorama-the-water-pollution-coverup>

⁴⁹ <https://deframedia.blog.gov.uk/2023/12/04/environment-agency-response-to-panorama-investigation/>

company's value chain to directly diminish its carbon footprint. This approach not only underscores the commitment to emission reduction but also serves as a fundamental principle, replacing traditional offsetting methods in alignment with broader sustainability goals.

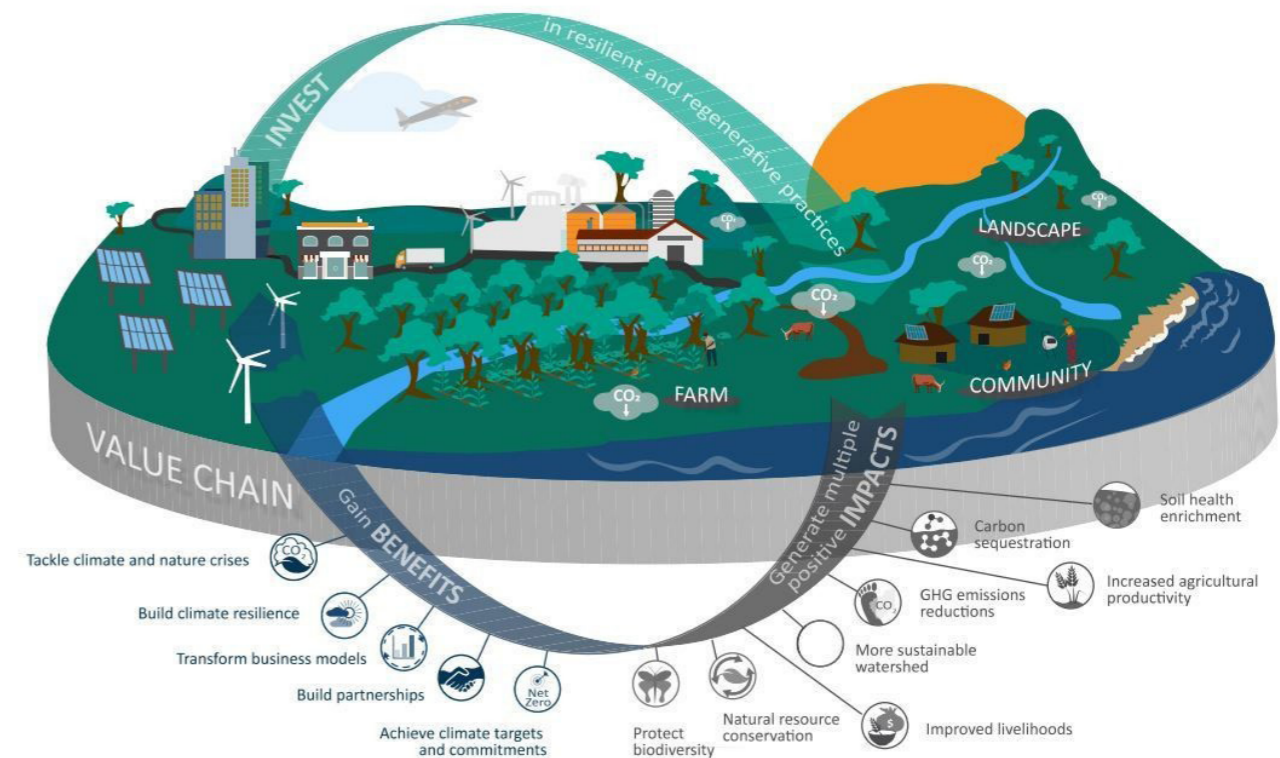
Implementing carbon insetting involves identifying areas within the value chain where emissions can be reduced. This may include investing in renewable energy projects, reforestation efforts, or sustainable agriculture practices where companies form partnerships or joint funds to finance these activities. By actively participating in projects that mitigate environmental impact, organisations not only contribute to global sustainability but also enhance their resilience to climate-related risks⁵⁰. From a scientific perspective, 'insetting' is not a novel initiative as it has existed as a concept since at least 2009⁵¹.

However, in 2009, there were less than 10 papers published in the scientific domain about "insetting" versus more than 10,000 papers about "offsetting". Why is it outlined as a key part of the trends nearly 15 years after it was first introduced as a concept – because it is expected to finally become mainstream and displace offsetting gradually over time.

Some good initiatives have a very long adaptation curve – a prime example is the humble heat pump. Heat pumps are a scientifically proven and cost-effective way to

decarbonise heat⁵². They were developed more than 150 years ago⁵³, commercialised more than 70 years ago⁵⁴ and there have been >600 million units installed worldwide⁵⁵. Why have they not replaced gas, oil, or coal heating globally? For starters, some consumers view them as an incredibly complicated technology^{56,57}, – despite existing for hundreds of years. In fact, the decarbonisation of heat is a large political issue, polarising parties worldwide⁵⁸. Additionally, a significant factor in the slow global adoption of heat pumps has been the covert lobbying campaigns. These campaigns, funded by fossil fuel companies, have employed PR representatives, former politicians, and trade associations to subtly oppose the use of heat pumps⁵⁹. What can we learn from this experience? Let's ensure the same narrative doesn't play out in wider sustainability issues.

To ensure the efficacy of carbon insetting, organisations need robust metrics and monitoring systems. Establishing KPIs allows companies to track the impact of their insetting initiatives over time, providing a quantifiable measure of their contributions to carbon reduction. This data-driven approach facilitates continuous improvement and demonstrates a commitment to tangible, measurable sustainability outcomes.



Understanding insetting.
Credit: International Platform for Insetting

“Organisations should transition from a narrow focus on carbon emission reduction KPIs to adopting a more comprehensive set of environmental KPIs. These metrics should encompass not only carbon but also include water and biodiversity considerations, ensuring they are clear and actionable for internal stakeholders.”



Aude Vergne
Chief Sustainability Officer at Chloé

⁵⁰ <https://www.sciencedirect.com/science/article/pii/S2590174523001605>

⁵¹ https://ecometrica.com/assets/insetting_offsetting_technical.pdf

⁵² <https://www.nature.com/articles/s41560-022-01104-8>

⁵³ <https://www.technologyreview.com/2023/02/14/1068582/everything-you-need-to-know-about-heat-pumps/>

⁵⁴ <https://www.osti.gov/etdeweb/biblio/6405008>

⁵⁵ <https://www.iea.org/reports/installation-of-about-600-million-heat-pumps-covering-20-of-buildings-heating-needs-required-by-2030>

⁵⁶ <https://www.ipsos.com/en-uk/brits-want-to-fight-climate-change-but-third-of-consumers-unaware-how-make-homes-greener>

⁵⁷ <https://www.edie.net/british-public-still-find-heat-pumps-too-expensive-and-complicated-lords-warn/>

⁵⁸ <https://www.ft.com/content/acd6e873-751a-46bc-b789-52fc49165833>

⁵⁹ <https://www.desmog.com/2023/07/20/revealed-media-blitz-against-heat-pumps-funded-by-gas-lobby-group/>

04 Leveraging technology for enhanced stakeholder engagement

As businesses face increasing pressure from regulations, investors, and consumers to ensure transparency and sustainability in their wider operations, effective stakeholder management will be crucial in 2024. Accordingly, 2024 will see businesses increasingly adopting technologies and tools to assist them in further engaging their stakeholders via understanding their supply chain and balancing their needs to create long-term value. Through engaging with wider stakeholders, businesses will create opportunities to learn more about their impact and gather materiality data.

Engaging suppliers and partners

For the majority of large entities, as much as **95% of their supply chain consists of a broad list of vendors**⁶⁰. Despite many of these partners being small and midsize companies, they still hold the potential to have an immense impact on the overall sustainability and performance of the entire supply chain. McKinsey claimed in 2016 that supply chains are responsible for up to 90% of a company's environmental impact on average⁶¹. The exact

number is however entirely sector, company, and methodology specific⁶².

Businesses will increasingly prioritise sustainability within every aspect of their supply chain to achieve set targets⁶³ and reduce their scope 3 emissions⁶⁴ in 2024. A recent Cambridge report highlighted that the case for circular (economy) start-ups is based on technological innovation⁶⁵. Industry leaders are seeking technological solutions to engage suppliers on decarbonisation, circularity, and sustainable distribution to unlock a newfound level of transparency and corporate value. This means businesses – irrespective of their size or industry – will ultimately be left with no other choice than to prioritise value-chain-wide sustainability.

Within the context of the impact of technological development, Ipsos raise an interesting question on whether the Chief Sustainability Officer (CSO) should become the Chief Value Creator⁶⁶. The role of CSO has evolved drastically over the last 5 years and as they say “with great power comes great responsibility”. The ESG performance of a company includes multi-faceted detailed data

about not only the company's (carbon) performance but the (carbon) performance of all its suppliers. CSO decision-making cuts across logistics, finance, sustainability, stakeholder engagement, and other departments or divisions. Technological solutions and analytical dashboards will play an ever-increasing role where the same underlying financial and carbon dataset could be categorised, visualised, and assessed differently: depending on how the board or C-suite responsibilities are split within the company governance⁶⁷.

Engaging investors with ESG

Investors are playing a crucial role in the growth and development of businesses. In parallel to sustainability's critical role in corporate boards' decision-making processes, 2024 will see investors continuing to direct capital towards sectors and companies based on their sustainability and ESG strategy. A Harvard Law review reveals that a majority of investors actively consider ESG in their decision-making, however, there are variations between countries⁶⁸. McKinsey believes that sustainable and low-carbon products perform better than those of peers on capital markets, achieving greater shareholder returns, profit margins and growth⁶⁹. They also outline ways and approaches of how ESG can increase the value proposition and deliver enhanced investment returns⁷⁰. Being able to

transparently measure sustainability KPIs and link them to wider corporate KPIs is a key output for any company in their investor engagements. We believe that sustainability plays a critical role in how businesses make decisions and a data-driven C-suite is empowered to take the optimal path for the development of their company.

Stakeholder engagement initiatives

Technological solutions are set to play a vital role in enhancing stakeholder engagement in 2024 – particularly within supply chains.

Undertaking engagement activities is a vital formative step when tackling decarbonisation initiatives. Utilising the assistance of technologies, businesses in 2024 are set to allocate resources toward the following strategies to further engage stakeholders across their entire value chain:

- 1 Setting and validating net-zero targets
- 2 Risk and opportunity analysis
- 3 Carbon footprint calculation and validation
- 4 Incorporating climate-related considerations into critical decision-making processes
- 5 Repositioning to meet the increasingly sustainable demands of consumers
- 6 Ensuring clear and transparent communications

60 <https://www.forbes.com/sites/sap/2022/04/15/owning-net-zero-small-actions-make-a-big-difference-in-b2b-relationships/?sh=26a8d55572f7>

61 <https://www.mckinsey.com/capabilities/sustainability/our-insights/starting-at-the-source-sustainability-in-supply-chains>

62 <https://onlinelibrary.wiley.com/doi/full/10.1111/jiec.13008>

63 <https://plana.earth/set-decarbonisation-targets>

65 https://www.cisl.cam.ac.uk/files/innovation_for_sustainability.pdf

66 <https://www.ipsos.com/sites/default/files/ct/publication/documents/2023-07/the-ipsos-esg-council-report-2023.pdf>

67 <https://link.springer.com/article/10.1007/s42979-023-01789-y#Sec3>

68 <https://corp.gov.IThe Ipsos ESG Council Report>

69 <https://www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/b2b-growth-is-where-its-green>

70 <https://www.mckinsey.com/-/media/McKinsey/Business%20Functions/Strategy%20and%20Corporate%20Finance/Our%20Insights/Five%20ways%20that%20ESG%20creates%20value/Five-ways-that-ESG-creates-value.ashx>

"Companies face mounting pressure to demonstrate their commitment to sustainability and set a leading example for their customers. The next frontier is when brands leverage technology to create transparent and immutable records of their sustainability efforts, establishing undeniable connections between their initiatives and their actual impact. This will not only foster trust but also enable companies to engage consumers more compellingly."



Catherine Bischoff
CEO at Sovereign Nature Initiative

Based on the evidence we've reviewed and our experience working with clients and guiding them through their net-zero journey, these are the key technological advancements for businesses:

Supplier relationship management (SRM) systems

SRM technologies are emerging as a fundamental stakeholder engagement tool as they provide a centralised platform for businesses to manage their relationships with suppliers. For instance, SRM platforms may include sustainability performance metrics, and ensuring that suppliers are engaged with, and adhere to sustainability standards and goals. Such technology also often facilitates collaboration between stakeholders, allowing suppliers, manufacturers, and distributors to work together towards common sustainability objectives.

Decarbonisation software

As stakeholder engagement becomes more important than ever in 2024, corporate entities will adopt comprehensive decarbonisation software solutions. Not only will such solutions enable businesses to collect data, measure their emissions, and ensure compliance with sustainability disclosures — but comprehensive sustainability software will provide businesses with expert guidance on engaging with suppliers and communicating with internal and external stakeholders along the entire net-zero journey.

Driven by the imperatives of transparency and sustainability, the landscape of stakeholder engagement is undergoing a transformative shift in 2024. Businesses are recognizing the critical role of effective stakeholder management in navigating the pressures from regulations, investors, and consumers. Technology, as a catalyst for change, is emerging as a key pillar in this transformation, offering innovative solutions such as SRM systems and decarbonisation software to engage stakeholders across the entire value chain.

Businesses who wish to effectively engage their stakeholders in this rapidly evolving sustainability landscape will be left with no other choice than to leverage the power of technological solutions in order to reap the true benefits of decarbonisation. Ready to

The year 2024 stands as a landmark in the journey towards enhanced climate disclosure, the message is clear: companies have an opportunity to take control of their destiny in this rapidly evolving regulatory landscape. The choice is stark — either let the tide of regulation determine your course or proactively steer your business towards resilience and market leadership.

While specialised support like Plan A is invaluable, the diversity of ESG necessitates tailored strategies. Businesses can choose to only be regulation-ready or embrace this challenge and shape the future of sustainable development. Are you ready to take this leap of faith?

Conclusion

The critical year of 2024 represents a landmark in advancing climate disclosure, developing low-carbon business models, engaging value chains and leveraging technology for accountability and transparency. Companies face a stark choice: adapt proactively to the evolving regulatory landscape or be passively shaped by it. Emphasising transparency and genuine commitment to sustainability efforts, this paper encourages businesses to move beyond mere regulatory compliance towards actively shaping sustainable development's future. It highlights the importance of embracing technological solutions for effective supplier engagement and stakeholder communication, advocating for a robust, data-driven approach to sustainability.



References

4 steps for reducing Scope 3 emissions and accelerating action through your supply chain. (n.d.). <https://www.cdp.net/en/articles/supply-chain/4-steps-for-reducing-scope-3-emissions-and-accelerating-action-through-your-supply-chain>

B2B growth is where it's green. (2022, April 22). McKinsey & Company. <https://www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/b2b-growth-is-where-its-green>

Barwich, A. (2019). The Value of Failure in Science: The Story of Grandmother Cells in Neuroscience. *Frontiers in Neuroscience*, 13. <https://doi.org/10.3389/fnins.2019.01121>

Bové, A., & Swartz, S. (2016, November 11). Starting at the source: Sustainability in supply chains. McKinsey & Company. <https://www.mckinsey.com/capabilities/sustainability/our-insights/starting-at-the-source-sustainability-in-supply-chains>

Calel, R., Colmer, J., Dechezleprêtre, A., & Glachant, M. (2021). Do Carbon Offsets Offset Carbon? Social Science Research Network. <https://doi.org/10.2139/ssrn.3950103>

Calvin, K., Dasgupta, D., Krinner, G., Mukherji, A., Thorne, P., Trisos, C. H., Romero, J., Aldunce, P., Barret, K., Blanco, G., Cheung, W. W. L., Connors, S., Denton, F., Diongue-Niang, A., Dodman, D., Garschagen, M., Geden, O., Hayward, B., Jones, C. D., . . . Ha, M. a. T. T. (2023). IPCC, 2023: Climate Change 2023: Synthesis Report, Summary for Policymakers. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland. IPCC, 1–34. <https://doi.org/10.59327/ipcc/ar6-9789291691647.001>

Cavanagh, C. J., & Benjaminsen, T. A. (2014). Virtual

nature, violent accumulation: The ‘spectacular failure’ of carbon offsetting at a Ugandan National Park. *Geoforum*, 56, 55–65. <https://doi.org/10.1016/j.geoforum.2014.06.013>

Cooke, P. (2023, July 31). Revealed: Media Blitz Against Heat Pumps Funded by Gas Lobby Group. *DeSmog*. <https://www.desmog.com/2023/07/20/revealed-media-blitz-against-heat-pumps-funded-by-gas-lobby-group/>

Copernicus: November 2023 – Remarkable year continues, with warmest boreal autumn. 2023 will be the warmest year on record. (n.d.). Copernicus. <https://climate.copernicus.eu/copernicus-november-2023-remarkable-year-continues-warmest-boreal-autumn-2023-will-be-warmest-year#:~:text=Copernicus%3A%20November%202023%20%E2%80%93%20Remarkable%20year,Copernicus>

Corporate Climate Responsibility Monitor 2023. (n.d.). NewClimate Institute. <https://newclimate.org/resources/publications/corporate-climate-responsibility-monitor-2023>

“Corporate net zero” “climate commitments” “Paris climate targets.” (n.d.). Net Zero Tracker. <https://zerotracker.net/analysis/new-analysis-half-of-worlds-largest-companies-are-committed-to-net-zero>

Crownhart, C. (2023, August 31). Everything you need to know about the wild world of heat pumps. *MIT Technology Review*. <https://www.technologyreview.com/2023/02/14/1068582/everything-you-need-to-know-about-heat-pumps/>

Defra Press Office. (2023, December 4). Environment Agency response to Panorama investigation. Defra in the Media. <https://deframedia.blog.gov.uk/2023/12/04/environment-agency-response-to-panorama-investigation/>

Department for Business, Energy & Industrial Strategy. (2021, March 29). Third of UK’s biggest companies commit to net zero. *GOV.UK*. <https://www.gov.uk/government/news/third-of-uks-biggest-companies-commit-to-net-zero>

Department for Energy Security and Net Zero. (2023, November 3). Thousands of homes to be kept warm by waste heat from computer data centres in UK first. *GOV.UK*. <https://www.gov.uk/government/news/thousands-of-homes-to-be-kept-warm-by-waste-heat-from-computer-data-centres-in-uk-first>

Dragomir, V. D., & Dumitru, M. (2022). Practical solutions for circular business models in the fashion industry. *Cleaner Logistics and Supply Chain*, 4, 100040. <https://doi.org/10.1016/j.clscn.2022.100040>

Ebersold, F., Hechelmann, R., Holzapfel, P., & Meschede, H. (2023). Carbon insetting as a measure to raise supply chain energy efficiency potentials: Opportunities and challenges. *Energy Conversion and Management: X*, 20, 100504. <https://doi.org/10.1016/j.ecmx.2023.100504>

EU to ban greenwashing and improve consumer information on product durability | News | European Parliament. (n.d.). <https://www.europarl.europa.eu/news/en/press-room/20230918IPRO5412/eu-to-ban-greenwashing-and-improve-consumer-information-on-product-durability>

FCA proposes new rules to tackle greenwashing. (2022, October 25). *FCA*. <https://www.fca.org.uk/news/press-releases/fca-proposes-new-rules-tackle-greenwashing>

Fearon, J. (1978). History and development of the heat pump. *www.osti.gov*. <https://www.osti.gov/etdeweb/biblio/6405008>

George, S. (2023, February 22). British public still find heat pumps too expensive and complicated, Lords warn. *Edie*. <https://www.edie.net/british-public-still-find-heat-pumps-too-expensive-and-complicated-lords-warn/>

Greenwashing. (2023, June 7). *ClientEarth*. <https://www.clientearth.org/what-we-do/priorities/greenwashing/>

Guest, S. (2022, April 15). Owing Net-Zero: Small Actions Make A Big Difference In B2B Relationships. *Forbes*. <https://www.forbes.com/sites/sap/2022/04/15/>

owning-net-zero-small-actions-make-a-big-difference-in-b2b-relationships/?sh=57bbcab472f7

Gupta, S., Langhans, S. D., Domisch, S., Nerini, F. F., Felländer, A., Battaglini, M., Tegmark, M., & Vinuesa, R. (2021). Assessing whether artificial intelligence is an enabler or an inhibitor of sustainability at indicator level. *Transportation Engineering*, 4, 100064. <https://doi.org/10.1016/j.treng.2021.100064>

He, R., Luo, L., Shamsuddin, A., & Tang, Q. (2021). Corporate carbon accounting: a literature review of carbon accounting research from the Kyoto Protocol to the Paris Agreement. *Accounting & Finance*, 62(1), 261–298. <https://doi.org/10.1111/acfi.12789>

Hodgson, C., Millard, R., & Nilsson, P. (2023, August 7). The humble heat pump blows a green wave across Europe. *Financial Times*. <https://www.ft.com/content/acd6e873-751a-46bc-b789-52fc49165833>

How the EU greenwashing regulations will impact your business. (2023, August 23). *Plan a Academy*. <https://plana.earth/academy/how-eu-greenwashing-regulations-impact-business>

IFRS – ISSB issues inaugural global sustainability disclosure standards. (n.d.). <https://www.ifrs.org/news-and-events/news/2023/06/issb-issues-ifrs-s1-ifrs-s2/>

Installation of about 600 million heat pumps covering 20% of buildings heating needs required by 2030 – Analysis – IEA. (n.d.). *IEA*. <https://www.iea.org/reports/installation-of-about-600-million-heat-pumps-covering-20-of-buildings-heating-needs-required-by-2030>

Insulation only provides short-term reduction in household gas. (2023, January 1). *University of Cambridge*. <https://www.cam.ac.uk/research/news/insulation-only-provides-short-term-reduction-in-household-gas-consumption-study-of-uk-housing>

Johnson, M., Rötzel, T. S., & Frank, B. (2023). Beyond conventional corporate responses to climate change towards deep decarbonization: a systematic literature review. *Management Review Quarterly*, 73(2), 921–954.

<https://doi.org/10.1007/s11301-023-00318-8>

Jonsdottir, B., Sigurjónsson, Þ. O., Jóhannsdóttir, L., & Wendt, S. (2022a). Barriers to Using ESG Data for Investment Decisions. *Sustainability*, **14**(9), 5157. <https://doi.org/10.3390/su14095157>

Kim, L. (2023, May 5). The Green Claims Global Drive: Developments in the UK, US and EU | *Global Policy Watch*. <https://www.globalpolicywatch.com/2023/05/the-green-claims-global-drive-developments-in-the-uk-us-and-eu/>

Kleinman, B. Z. (2023, March 14). Tiny data centre used to heat public swimming pool. *BBC News*. <https://www.bbc.com/news/technology-64939558>

Long, J., & Sanders, M. (2023, September 1). Brits want to fight climate change, but a third of consumers unaware of how to make homes greener. *Ipsos*. <https://www.ipsos.com/en-uk/brits-want-to-fight-climate-change-but-third-of-consumers-unaware-how-make-homes-greener>

Min, B., Ross, H., Sulem, E., Veyseh, A. P. B., Nguyen, T. H., Sainz, O., Agirre, E., Heintz, I., & Roth, D. (2023). Recent advances in natural language processing via large pre-trained language models: a survey. *ACM Computing Surveys*, **56**(2), 1–40. <https://doi.org/10.1145/3605943>

Murray, C. (2023b, September 22). Why making business decisions is harder than ever. *Raconteur*. <https://www.raconteur.net/leadership/why-decision-making-is-more-complex-than-ever>

Nasr, M., Carlini, N., Hayase, J., Jagielski, M., Cooper, A. F., Ippolito, D., Choquette-Choo, C. A., Wallace, E., Tramèr, F., & Lee, K. (2023). Scalable Extraction of Training Data from (Production) Language Models. *arXiv (Cornell University)*. <https://doi.org/10.48550/arxiv.2311.17035>

Panorama – The Water Pollution Cover-Up. (n.d.). *BBC iPlayer*. <https://www.bbc.co.uk/iplayer/episode/m001t4g5/panorama-the-water-pollution-coverup>

Policy & Regulations | Plan A. (n.d.). *Plan A*. <https://plana.earth/category/policy-regulations>

[earth/category/policy-regulations](https://plana.earth/category/policy-regulations)

PricewaterhouseCoopers. (n.d.). Decarbonisation rates must far outstrip anything seen before to limit warming to 1.5°C, finds PwC's Net Zero Economy Index. *PwC*. <https://www.pwc.com/gx/en/news-room/press-releases/2022/net-zero-economy-index-2022.html>

Rosenow, J., Gibb, D., Nowak, T., & Lowes, R. (2022). Heating up the global heat pump market. *Nature Energy*, **7**(10), 901–904. <https://doi.org/10.1038/s41560-022-01104-8>

Schiemann, F., & Tietmeyer, R. (2022). ESG Controversies, ESG Disclosure and Analyst Forecast Accuracy. *International Review of Financial Analysis*, **84**, 102373. <https://doi.org/10.1016/j.irfa.2022.102373>

Sdiri, B., Rigaud, L., Jemmali, R., & Abdelhedi, F. (2023). The Difficult Path to Become Data-Driven. *SN Computer Science*, **4**(4). <https://doi.org/10.1007/s42979-023-01789-y>

Seddon, N. (2022). Harnessing the potential of nature-based solutions for mitigating and adapting to climate change. *Science*, **376**(6600), 1410–1416. <https://doi.org/10.1126/science.abn9668>

Set decarbonisation targets | Plan A. (n.d.). *Plan A*. <https://plana.earth/set-decarbonisation-targets>

Stapp, J. R., Nolte, C., Potts, M. D., Baumann, M., Haya, B., & Butsic, V. (2023). Little evidence of management change in California's forest offset program. *Communications Earth & Environment*, **4**(1). <https://doi.org/10.1038/s43247-023-00984-2>

Tang, C. S. (n.d.). Lego's ESG dilemma: Why an abandoned plan to use recycled plastic bottles is a wake-up call for supply chain sustainability. *The Conversation*. <https://theconversation.com/legos-esg-dilemma-why-an-abandoned-plan-to-use-recycled-plastic-bottles-is-a-wake-up-call-for-supply-chain-sustainability-214573>

TechCrunch is part of the Yahoo family of brands. (2023, December 5). <https://techcrunch.com/2023/12/05/chatgpt-everything-to-know-about-the-ai-chatbot/>

[com/2023/12/05/chatgpt-everything-to-know-about-the-ai-chatbot/](https://techcrunch.com/2023/12/05/chatgpt-everything-to-know-about-the-ai-chatbot/)

The data center that warms homes with waste heat | GreenBiz. (n.d.-a). <https://www.greenbiz.com/article/data-center-warms-homes-waste-heat>

The Harvard Law School Forum on Corporate Governance. (2023, March 11). ESG Battlegrounds: How the States Are Shaping the Regulatory Landscape in the U.S. <https://corpgov.law.harvard.edu/2023/03/11/esg-battlegrounds-how-the-states-are-shaping-the-regulatory-landscape-in-the-u-s/>

Ucl. (2020, November 3). Energy use in the UK building stock: new empirically based models. *UCL Energy Institute* <https://www.ucl.ac.uk/bartlett/energy/energy-use-uk-building-stock-new-empirically-based-models>

Welborn, A. (2023, March 14). ChatGPT and fake citations – *Duke University Libraries blogs*. *Duke University Libraries Blogs*. <https://blogs.library.duke.edu/blog/2023/03/09/chatgpt-and-fake-citations/>

Welch, K., & Yoon, A. (2022). Do high-ability managers choose ESG projects that create shareholder value? Evidence from employee opinions. *Review of Accounting Studies*, **28**(4), 2448–2475. <https://doi.org/10.1007/s11142-022-09701-4>

What is carbon insetting? (n.d.). *Plan A*. <https://plana.earth/glossary/carbon-insetting>

Xu, Z., Hou, W., Main, B. G. M., & Ding, R. (2022a). The impact of ESG on financial performance: a revisit with a regression discontinuity approach. *Carbon Neutrality*, **1**(1). <https://doi.org/10.1007/s43979-022-00025-5>

Ready to get ahead of the most important sustainability trends for your business?

GET IN TOUCH TO START YOUR DECARBONISATION JOURNEY WITH PLAN A.

LEARN MORE

BOOK A DEMO

STAY UP TO DATE ON SUSTAINABILITY IN BUSINESS.



LinkedIn



Instagram



Newsletter

planA