State of Green Business 2023

BY JOEL MAKOWER & THE EDITORS & ANALYSTS AT GREENBIZ

GreenBiz group

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Foreword

BY JOEL MAKOWER

Welcome to the 2023 State of Green Business report, our 16th annual.

It's an incredibly exciting time to be in the sustainability profession, a be-careful-what-you-wish-for moment, even. Suddenly (although not so suddenly), the world understands and appreciates what we do and the important knowledge and perspective sustainability professionals bring to their companies, communities and the world. Finally, sustainability is a hot-button issue. At last, there's supporting policy and investor pressure demanding that companies move further, faster.

Of course, it's not all a bed of green roses. With that newfound attention comes increased scrutiny and, in some cases, pushback. Sustainability, and its larger cousin, ESG, have become a lightning rod in some circles, as a small cabal of politicians and pundits seek to score points by attacking sustainability issues and investments as "woke" or worse. Of course, these things wouldn't be under attack if they weren't having an impact, which may be a positive spin but is also a proof point: What we do matters.

In short, the risks are growing, but so are the rewards — to professionals, their organizations and, ultimately, to the planet and all who live here.

This year, as we have since 2008, the GreenBiz editors and analysts have selected 10 key trends worth watching, reflecting a broad spectrum of environmental and sustainability topics: transportation, carbon removal, the circular economy, climate tech, sustainable food systems, renewable energy and more. You'll also find data and commentary on the state of biodiversity, from our partners at S&P Global; and on green jobs and careers, from LinkedIn.

Thanks for reading. As always, I hope you enjoy this year's report and look forward to your comments.

The State of Biodiversity

BY RICHARD MATTISON

PRESIDENT, S&P GLOBAL SUSTAINABLE1

We're at a pivotal moment for the corporate world's understanding of biodiversity's connection to climate change and the financial implications of nature loss.

This changing tide was apparent at the U.N.'s COP15 meeting in Montreal, Canada, last month, where more than 190 countries agreed to a historic package of goals and targets aimed at halting and reversing nature loss by 2030.

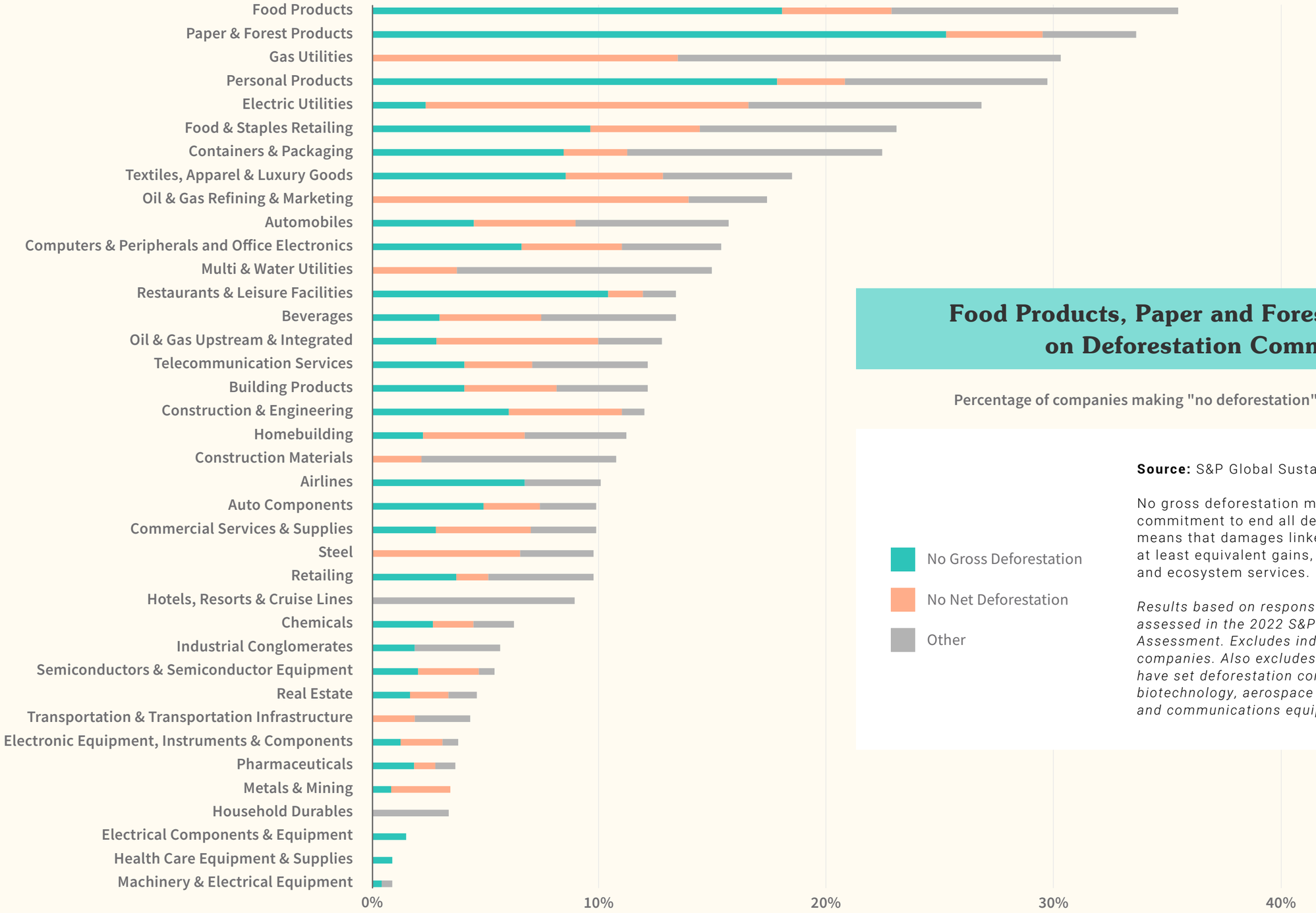
Investors and the private sector are paying more and more attention to the topic of biodiversity, but only a small share of companies globally have set targets to protect biodiversity or address deforestation, according to research by S&P Global Sustainable1.

This trend holds true even for regions where governments have set ambitious biodiversity goals, such as in the European Union. Only about one-third of Europe's biggest companies have set such targets, while adoption rates are even lower among the largest companies in Asia-Pacific and the U.S.

Most companies with biodiversity targets aim to reach their goals by 2030, according to S&P Global Sustainable1 data. But we also see that only a small share of companies have committed to preserving biodiversity or addressing deforestation across their supply chains, where most of the damage is being done.

The picture is similar when it comes to nature-related finance. At present, financial institutions' offerings related to biodiversity or ecosystem services are far less developed than their products geared toward climate change, an analysis of S&P Global Corporate Sustainability Assessment data shows.

Addressing the biodiversity and climate crises in tandem is also increasingly urgent. One key example of how biodiversity and climate change are intertwined is the low-carbon transition, which will require a huge expansion in the supply of elements like lithium and copper to support new infrastructure.



Food Products, Paper and Forest Products Lead on Deforestation Commitments

Percentage of companies making "no deforestation" commitments by industry

No Gross Deforestation

No Net Deforestation

Other

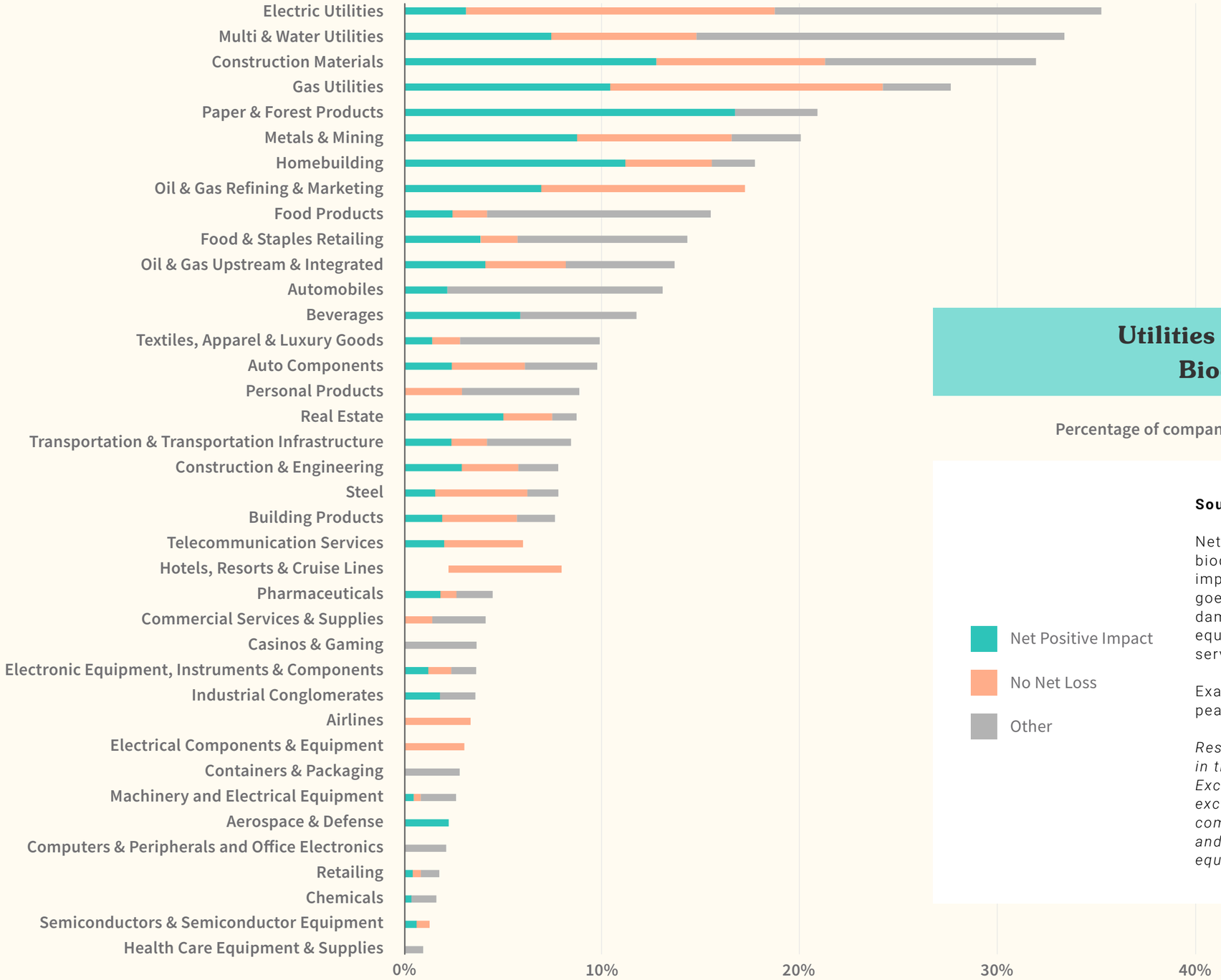
Source: S&P Global Sustainable1. Data as of November 2022.

No gross deforestation means the company has made a commitment to end all deforestation. No net deforestation means that damages linked to business activity are offset by at least equivalent gains, avoiding a net loss of biodiversity and ecosystem services.

Results based on responses from 3,634 companies assessed in the 2022 S&P Global Corporate Sustainability Assessment. Excludes industries that each had less than 20 companies. Also excludes industries in which no companies have set deforestation commitments. Those industries are biotechnology, aerospace and defense, casinos and gambling and communications equipment.

Utilities Industries Lead the Pack on Biodiversity Commitments

Percentage of companies making nature-related commitments by industry

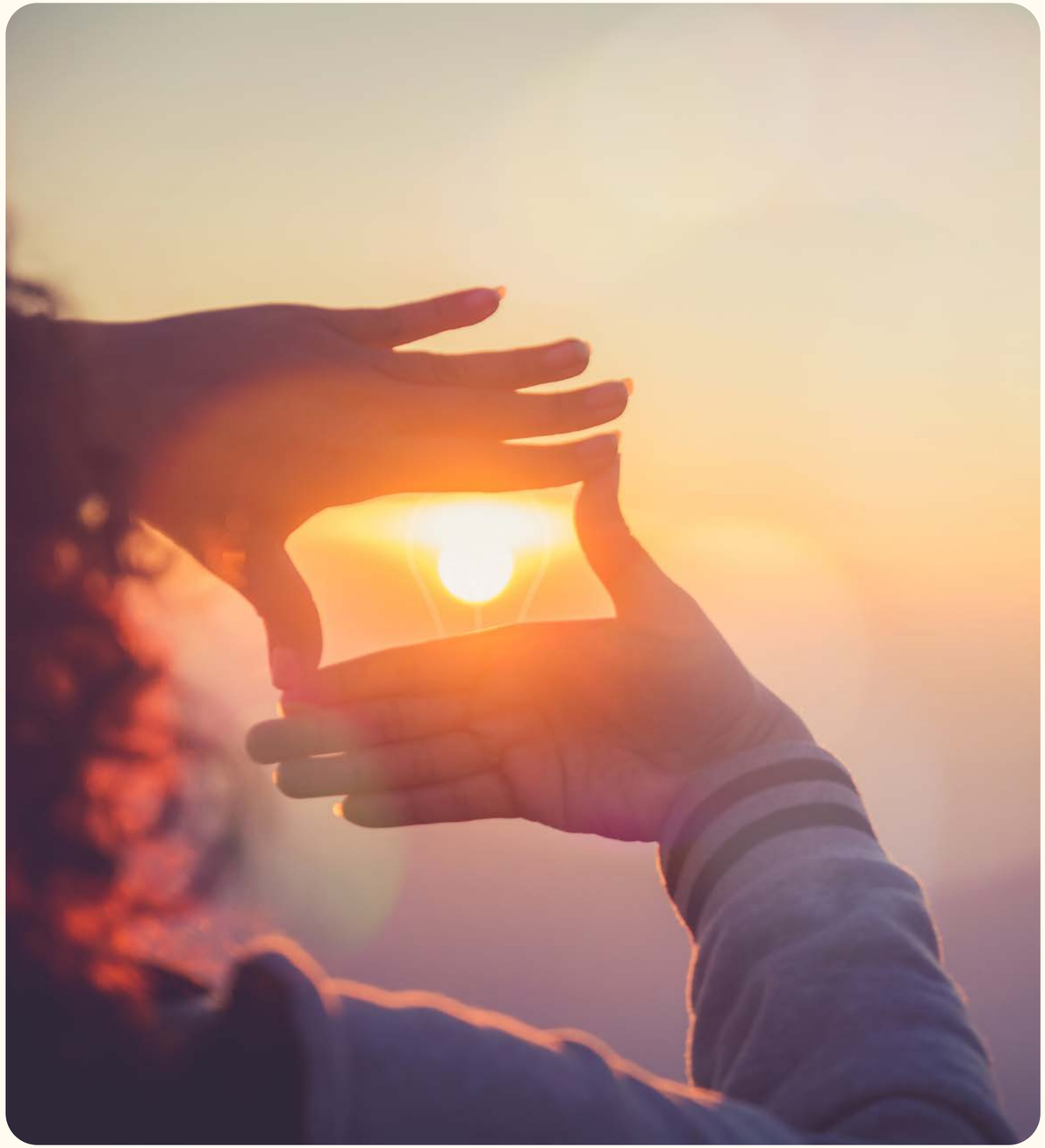


Source: S&P Global Sustainable1. Data as of November 2022.

Net positive impact, or NPI, means that corporate actions on biodiversity, such as habitat protection, are greater than the impact from its business activity. A commitment to NPI typically goes further than one to no net loss, or NNL. NNL means that damages linked to business activity are offset by at least equivalent gains, avoiding a net loss of biodiversity and ecosystem services.

Examples of "other" commitments include: No deforestation; no peat; no exploitation; and the use of certified raw materials, etc.

Results based on responses from 3,654 companies assessed in the 2022 S&P Global Corporate Sustainability Assessment. Excludes industries that each had fewer than 20 companies. Also excludes industries in which no companies have set deforestation commitments. Those industries are biotechnology, restaurants and leisure facilities, household durables and communications equipment.



Mining exploration around the world is picking up to meet this need, but research by S&P Global Sustainable1 has found that existing mines and exploration sites overlap with some of the world's most important areas for biodiversity. Of the 1,276 mining sites that intersect with Key Biodiversity Areas, 29% of these sites are for extracting minerals needed for the low-carbon energy transition. Enabling the energy transition while managing the potential negative impacts on biodiversity is a complex challenge.

Although we see some encouraging signs from the private sector, our data indicates corporations still have a long way to go — including when it comes to the way we communicate about nature and biodiversity. We heard repeatedly during COP15 about the lack of shared language around nature and biodiversity, and the need for education around these topics. S&P Global Sustainable1 is working to address some of these challenges by convening a knowledge community to consult on the development of data intelligence to accelerate a shift of capital towards nature-positive outcomes through the universal lens of the Taskforce on Nature-related Financial Disclosures (TNFD).

Richard Mattison *is president of S&P Global Sustainable1*

The State of Green Jobs and Careers

BY PEGGY BRANNIGAN AND EFREM BYCER

LINKEDIN

Fighting climate change is a human capital challenge. Our global economy needs to create millions of new green jobs while also making the existing jobs (and the workers in them) greener. Making a job greener means equipping those workers with green skills so they take a more sustainable approach to their daily work activities.

LinkedIn worked with a team of internal and external experts to develop a list of 600 core green skills and 400 green-adjacent skills. Researchers at LinkedIn can use this list of skills to categorize job titles by "green skill intensity" or the extent to which green skills are present in the average skills profile for any title. Using this approach, we can identify "Green" jobs that have a high green skills intensity, as well as "Greening" jobs — more traditional jobs (such as construction or investing) that increasingly are done with sustainability in mind, as indicated by the growing prevalence of green skills among LinkedIn members in those positions.

Fastest-Growing Titles

We can use the grouping of titles in the Green and Greening categories, as well as longitudinal data on job counts to identify the fastest titles in both categories. Our main takeaway from this analysis: policy change and infrastructure development are pillars of the green economy transition.

For example, titles related to environment, health and safety (EHS) dominate the fastest-growing Green titles. As all levels of government adopt new environmental regulations, employers need people on staff to ensure compliance with those regulations. Likewise, government and business need to better understand how commercial and industrial operations can affect the environment. The fact that EHS titles are experiencing high growth at multiple levels of seniority reinforces how important these roles are.

Energy Manager rounds out the fastest-growing Green titles as utilities, large corporations, and startups engage in increasing renewable energy production, energy storage and energy efficiency across their operations. While Wind Turbine Technician and Solar Consultant aren't among the top job titles, these also experienced significant growth in the last five years, further highlighting growing investment in transitioning away from fossil fuels.

The fastest-growing Greening titles may not necessarily be obviously green, but green skills are increasingly required to succeed in these roles and their growth tells an important story. For example, the inclusion of Director of Regulatory Affairs on this list echoes the emphasis on EHS titles we saw on the Green titles list. Not only do companies need to focus on compliance, they also need to have policy- and advocacy-skilled employees representing their interests as regulatory bodies determine the rules. The fact that Director of Regulatory Affairs is a Greening title also reveals something important: To remain competitive in their jobs, regulatory affairs professionals need to learn relevant green skills as this category of regulations increasingly impacts business operations.

Multiple titles on the Greening list are related to infrastructure, construction and buildings. These aren't new types of jobs, but rather jobs that need to be done in a different, greener way. Workers in these titles now must assess the environmental impact of how they might site or build a project, select more sustainable building materials and operate buildings to use less energy, produce less waste and better conserve scarce resources like water.

Fastest-growing "Green" and "Greening" Jobs, 2017-22 (Compound Annual Growth Rate of CAGR)

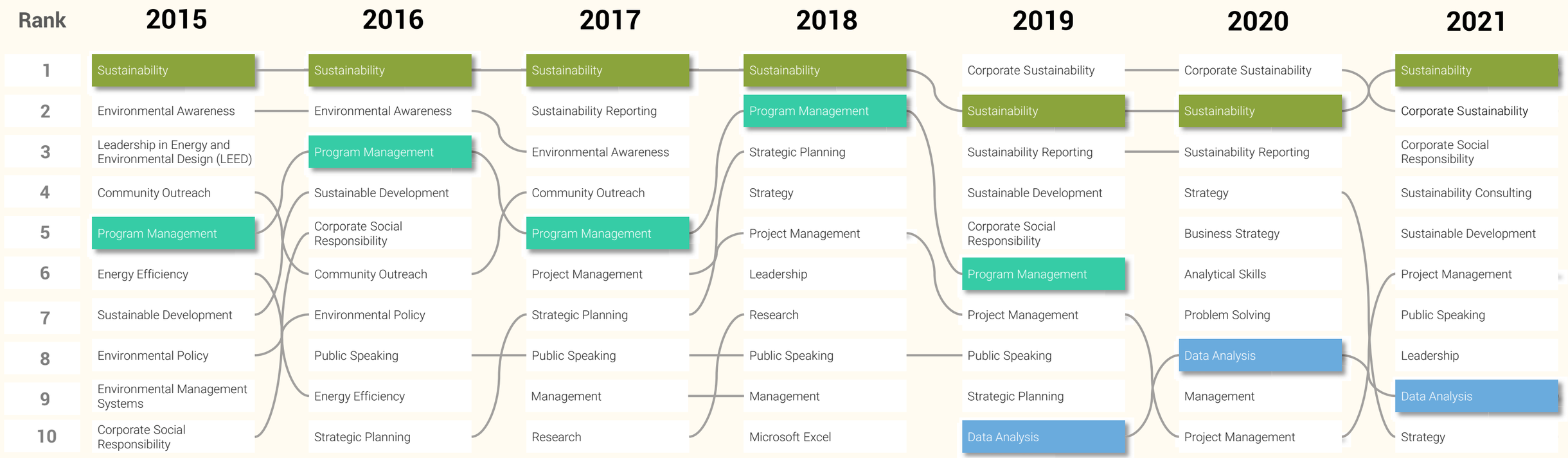
Title	Job Type	CAGR
Environmental Health Safety Engineer	Green	28.0%
Sustainability Manager	Green	27.3%
Head of Environment Health and Safety	Green	25.1%
Health and Safety Environment Engineer	Green	23.8%
Environment Health and Safety Manager	Green	21.0%
Environment Health and Safety Specialist	Green	19.8%
Director of Environmental Health Safety	Green	14.5%
Health Safety Environments Supervisor	Green	12.6%
Energy Manager	Green	9.1%
Director of Public Works	Greening	28.0%
Power Generation Engineer	Greening	27.4%
Extension Agent	Greening	26.5%
Thermal Engineer	Greening	25.5%
Process Engineering Manager	Greening	23.9%
Preconstruction Manager	Greening	23.8%
Survey Project Manager	Greening	21.4%
Vice President Facilities	Greening	20.9%
Director of Regulatory Affairs	Greening	20.7%

A Shifting Landscape

The idea that the skills required for these jobs are changing is nothing new. Jobs change over time and that is also certainly true of Green titles, even those perceived to be relatively new. Our research into how jobs evolve over time last year revealed that the average skills profile saw a 25 percent change between 2016 and 2021, and we expect that change to reach 50 percent by 2027.

How this looks in practice varies from job to job. Let's look at how the skills have evolved over time for Sustainability Manager, one of the fastest-growing Green titles, according to our data. In this example, we see that the top 10 skills for Sustainability Manager have changed significantly over time.

Top 10 Skills Ranked for Sustainability Managers From 2015 to 2021



Source: LinkedIn

Here are two notable ways the job has changed in terms of skills:

- **Data analysis.** New tools, often digital ones, mean that sustainability professionals have more data than ever with which to analyze their company's performance and track key metrics. They need to have the skills to manipulate that data to assess the effectiveness of different strategies and to make data-informed recommendations to executives and report externally.

- **Business skills.** Sustainability managers are cross-functional actors working across departments to convince leaders to change their operations and adopt new practices. This manifests itself in our data with the increased importance of public speaking to deliver compelling presentations and strategy as sustainability professionals are seen as core business professionals rather than technocrats advising the business.

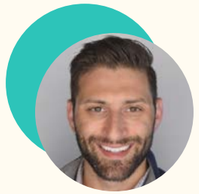
Looking at the most common skills among sustainability professionals shows that they always include non-green skills such as strategy and project management. We know that current demand for sustainability professionals today outpaces supply of those workers. That means that many of the people who enter the sustainability profession do so having most recently held a non-green title. According to LinkedIn data, approximately 21.5 percent of all transitions into Sustainability Manager are by workers with no prior green experience. Their transitions into this role are done via the relevant non-green skills to succeed as a Sustainability Manager.

Looking Ahead

The successful transition to a greener economy requires that these Green and Greening jobs continue to grow. We also need to accelerate the greening of more titles across the workforce, particularly when it comes to such categories as transportation and energy, the largest sources of carbon pollution, and finance, where countries and companies must find the resources to fund and scale new technologies and approaches. That will require widespread upskilling initiatives where governments, businesses, universities and other players understand which green skills are important to each respective job title.

As we move forward with our green economy research agenda, LinkedIn is focused on how we can facilitate a skills-based approach to greening the workforce and what it will take to ensure that the economic opportunities presented by these growing, in-demand jobs reach more people and communities.

Peggy Brannigan *is director, global environmental sustainability at Linkedin*



Efrem Bycer *is senior manager, public policy and economic graph at Linkedin*

Top Sustainable Business Trends of 2023

BY JOEL MAKOWER

"Stay the course."

That may be the key message coming out of the convulsing, confounding year that was 2022. For all that those 12 months threw at us — a still-raging pandemic, a global economic downturn, major supply-chain choke points, political upheavals, climate-exacerbated natural disasters and a global energy crisis spurred by Russia's unprovoked invasion of Ukraine — there's no turning back for sustainability professionals.

Of course, inflation and low economic growth led some companies to tap the brakes, slowing some initiatives, including the increased headcount that goes with companies' growing sustainability ambitions. But not for long. There's a general sense that the critical nature of social and environmental challenges, and the risks they pose to companies and society, will keep sustainability a hot-button business issue for the foreseeable future.

Oddly, some of the perturbations listed above have had a salutary effect on progress. The energy crisis laid bare the world's unsustainable reliance on oil and natural gas from unfriendly nations and led to a ramping up of renewable, homegrown energy sources, notably solar and offshore wind along with fast-growing energy storage technologies. The spiking of gasoline and diesel prices accelerated the uptake of electric vehicles of all types, from e-bikes to big-rig trucks and everything in between. Supply-chain shortages contributed to a relocalization of manufacturing and logistics, driving down the emissions from shuttling things across oceans. Low-input indoor agriculture took root alongside rising food prices and distribution disruptions.

Still, it's a treacherous, often terrifying time, given the real-world indicators of progress, or lack thereof. And to look only at the positive outcomes belies the immense challenges ahead: more extreme weather disruptions; more dithering by political leaders on decisively addressing the climate, biodiversity and equity crises; more evasive maneuvers by the fossil fuel lobby and its acolytes to delay a global energy transition; more plastics polluting oceans, reservoirs and, ultimately, our bodies. And more corporate

commitments and pronouncements unmatched by actual, or at least sufficient, progress.

It's another round of the sustainability cha-cha: two steps forward, one step back.

To be sure, the dance can be invigorating. Breakthroughs in decarbonizing energy production; high-performance chemicals and materials made without fossil fuels; new generations of plant- and cell-based meat alternatives; building technologies that enable healthier, more adaptive workplaces — these and many other advances have inspired us and promise positive economic and sustainability outcomes in the coming years.

And it's not just scrappy entrepreneurs who are leading the charge, though there is no shortage of those. Many of the world's largest companies, from furniture-makers to food producers to fashion houses, are developing or acquiring technologies that can accelerate their own transitions to more sustainable products, services and delivery systems.

In short, much of the sustainability wish list is coming to fruition — gradually, then suddenly, as Ernest Hemingway once put it. At last, biodiversity and natural capital are being recognized as critical inputs to business and industry; healthy ocean ecosystems are linked to climate mitigation and resilience; the financial sector, from insurance to banking to venture capital, is awakening to a post-oil future; and forthcoming transparency and disclosure frameworks promise to help separate leaders from laggards.

And despite a small but noisy cabal of right-wing ideologues in the United States, stakeholder capitalism is alive and well, as companies and mainstream investors increasingly view environmental and social issues not as some social engineering conspiracy but as activities critical to business and macroeconomic success. What some dismiss as "woke capitalism" is seen by many business leaders as waking up to 21st-century realities.

So, where does that leave us? What can we expect from 2023?

To answer that, for the 16th consecutive year, we've tapped the GreenBiz analyst and editorial teams to identify 10 key trends and developments we'll be watching over the coming 12 months. Here, in no particular order, is what they reported.

Joel Makower *is chairman and co-founder of GreenBiz Group*

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Micromobility and Transit Pave the Way to Net Zero

BY VARTAN BADALIAN

The road to decarbonizing transport is looking more promising. Shifting transportation away from cars toward public transport and micromobility options across the world's cities must roughly double in this decade to align with the Paris Agreement. And between 40 to 80 percent of global miles traveled in cities must be from walking, cycling or public transit, according to the C40 Cities Climate Leadership Group. Businesses, governments and individuals are starting to take this road.

Large company fleets, such as IKEA's, are leading the way, driven partially by the mandates of climate-forward cities. Paris and London, for example, are pushing companies to accelerate decarbonization through zero- and ultra-low emission zones as well as congestion pricing for delivery services. New York City last year announced a request for delivery-making businesses and freight operators to help kick off a pilot in July to develop "efficient, sustainable and economically feasible" distribution micro-hubs. Doing so would accelerate cargo bike deliveries, which more than doubled in nine early months of the coronavirus pandemic, between May 2020 and January 2021.

UPS in Europe began testing its Quad electric cargo delivery bike in the Big Apple last year. Volta Trucks, a Swedish electric commercial vehicle manufacturer, partnered with CAKE, an electric motorcycle and moped company, to support retail giant H&M in mode-shifting its last-mile deliveries in Paris. Amazon launched its first fleet e-cargo bike and on-foot delivery program in the U.K. And Urb-E, a cargo bike and final-mile delivery company, announced that it's expanding to Los Angeles.

More innovation is coming. While micromobility can be a valuable tool to decrease emissions depending on its application, minimobility — which includes three- or four-wheeled vehicles for one to two people with added protection from the elements — is also grabbing attention. A global McKinsey report found 30 percent of respondents are likely or very likely to consider minimobility in the future.

One analysis found that if the 50 largest U.S. cities adopted certain shared

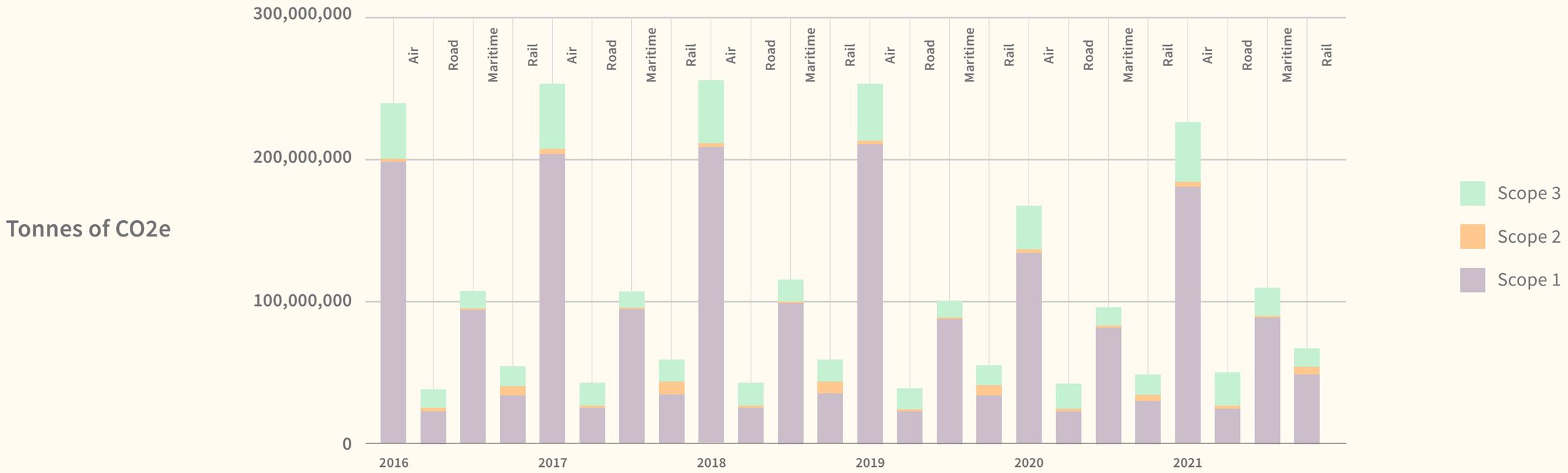
mobility services at scale, they could cut 100 million metric tons of greenhouse gas emissions annually, equating to 40 percent of all U.S. transport emissions.

Still, the transition won't be easy. Cities will need to prioritize shifting people away from personal vehicles; build new bike lanes; and expand, electrify and improve public transit to serve more people and create interconnected systems between modes of transportation. However, cities aren't alone as the federal Infrastructure Investment and Jobs Act provides $89.9 billion for public transit.

To maximize emissions reductions, it will be critical for cities to use micromobility and minimobility as replacements for driving, not public transit and walking. In good news, several companies including Lyft and Uber-backed Lime note that 36 percent and 27 percent of users, respectively, are mode shifting from cars to shared e-bikes or scooters.

In addition, lifecycle emissions are coming into focus for the micromobility industry. The circularity of shared e-scooters and bikes was a deeper concern in the early days of the industry four to five years ago, with vehicles prone

Emissions from Air, Road, Maritime and Rail Travel Rebounded After a Pandemic-Era Decline

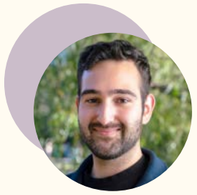


Source: S&P Global Sustainable1. Data as of November 2022.
Analysis based on the S&P Global Trucost Environmental Dataset, showing the five-year trend in emissions profile for S&P 1200 companies in the transportation and logistics sectors, which include air, road, maritime and rail.

to shorter lifespans. However, a recent study found that these lightweight vehicles reduced net carbon emissions across their lifecycles in five out of six cities. Also, recent news that Lyft will recycle its e-bike and e-scooter batteries in partnership with Redwood Materials points to further industry progress on net carbon emissions and vehicle lifespans.

Several startups have their eye on improving outdated public transit systems. For example, 4AI Systems uses machine learning vision systems to enhance rail networks, improving public transit efficiency and helping cities increase ridership. Meanwhile, cities worldwide continue to adopt zero-emission buses, China having the largest global share.

Net-zero transport emissions by 2050 will remain a dream without shifting away from polluting vehicles. Public transit, micromobility and smart policy decisions all hold the key, and more players are reaching for it.



Vartan Badalian *is transportation analyst at GreenBiz Group*

Sustainability Gets Schooled at Work

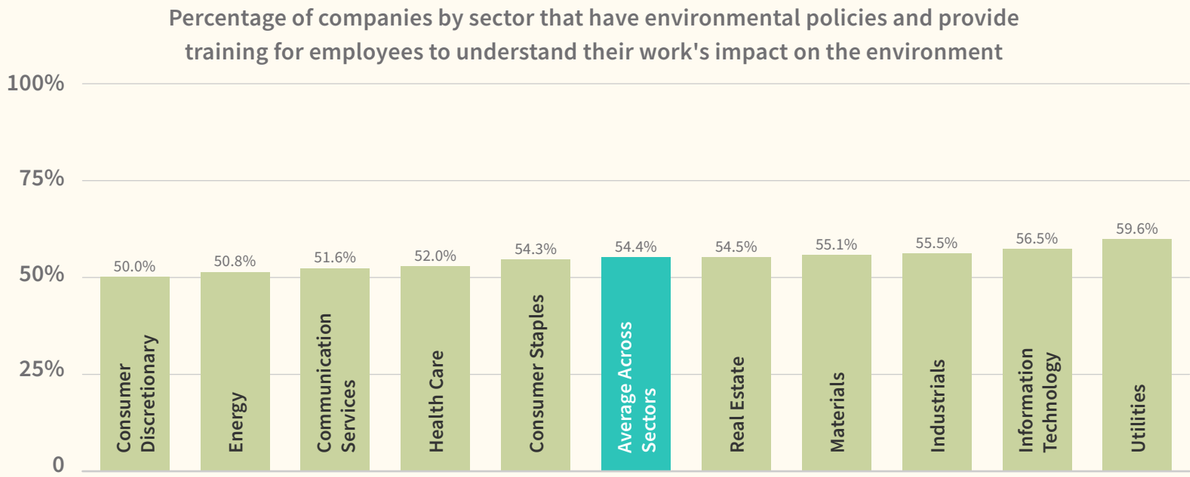
BY JOHN DAVIES

Corporations are starting to invest in educating employees — in some cases, tens of thousands of them — about the relationship of sustainability and ESG issues to business success. Business leaders, in pursuit of meeting their science-based targets, are looking beyond green teams and community cleanups to motivate employees to incorporate sustainability at work and at home.

Doing that requires a new generation of courses and delivery systems. Numerous educational offerings related to sustainability and climate have emerged in the past couple of years, ranging from online learning platforms such as Salesforce's Trailhead and Microsoft's LinkedIn Learning to climate courses from organizations such as terra.do and certificate programs from universities and others.

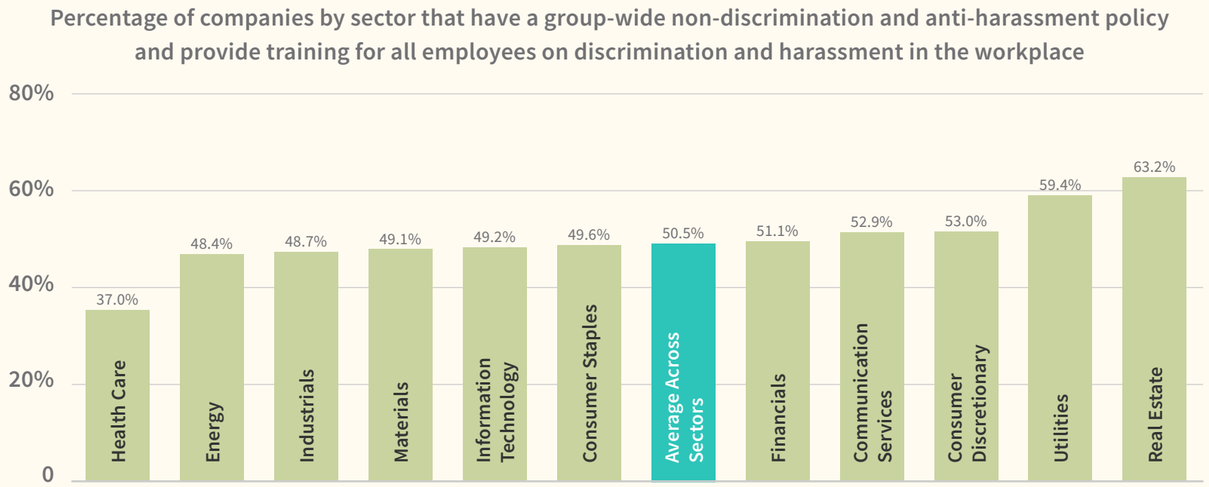
The catch? It requires a motivated student.

Energy Sector Lags Others in Training Employees on Environmental Impact



Source: S&P Global Sustainable1. Data as of November 2022. *Results based on responses from 1,403 companies assessed in the 2022 S&P Global Corporate Sustainability Assessment that affirmed they have environmental policies.*

Only Half of Companies in Most Sectors Indicate Their Employees Receive Discrimination and Harassment "On-Camera" Training



Source: S&P Global Sustainable1. Data as of November 2022. *Results based on responses from 1,702 companies assessed in the 2022 S&P Global Corporate Sustainability Assessment that affirmed they have a group-wide non-discrimination and anti-harassment policy.*

That's why company leaders are looking for various ways to meet their employees where they are. Jones Lang LaSalle produced a series of short video modules to explain sustainability and ESG, what the firm is doing in that arena and why it's important to the company and its clients. Avnet took a similar approach, and both used outside talent to avoid one employee being the lone face of sustainability within the company.

Global Sustainability Director Brandy Wilson is that face at J.R. Simplot, the potato and agribusiness supply company. During COVID, she started recording video explainers that provide specific examples for employees about what the company is doing, how it is working to influence its value chain and how it responds to customer sustainability requests. While these are more homespun recordings, the explainers make it easy to create new episodes in response to questions asked after the first few videos.

As for all companies, the key to success is using specific examples from their business. These videos also typically provide links to additional resources for the more motivated employees. Avnet, for one, is sourcing user-generated content from employees on how they're pursuing sustainability at home and on the job.

When it comes to meeting employees where they are, Genentech has developed an online resource not only to share its sustainability goals but also to provide toolkits for taking action. Topics include air travel, commuting, sustainable science and product stewardship. The meeting and events toolkit, which is targeted to admins, points the way toward the next phase of this project. Employees will soon be able to click on their job function and be directed to the appropriate toolkits for their specific role. Those seeking a pre-built platform to achieve this can look into Climate Club.

Some companies are giving employees a deeper dive into the world of sustainability through interactive simulations. Griffith Foods, for example, has sent several cohorts of employees through the WholeWorks certificate program that helps them learn by doing as they participate in a "whole-system simulation" about pursuing sustainability at a traditional business. Participants also receive personal coaching to develop an implementable project for their employer. For the finance industry, Attain has developed a unique game-based learning platform to help its workforce quickly develop sustainable finance skills.

At this early stage, it's not clear how success will be measured but given the aggressive sustainability goals many companies have set, it's employers' hope that every job can become a sustainability job.

John Davies *is senior vice president and senior analyst at GreenBiz Group*

Companies Learn to Measure the Unmeasurable

BY JESSE KLEIN

The past few decades of corporate sustainability have been characterized by countless pledges and commitments targeting the end of this decade. But as those 2030 deadlines get closer, the talk has moved to action and impact — and even more so, measuring that impact.

Quantitative goals have applied to carbon emissions for a long time, such as net-zero emissions and 1.5 Celsius degrees of warming. However, the many other factors that contribute to the climate crisis as well as the embedded social impacts lack such straightforward numbers. So how does the adage of "what gets measured gets managed" apply to factors where the assessment is more subjective? That is the question companies and organizations are starting to unpack.

Understanding companies' impacts and improvements will require innovative and more nuanced methodologies. Tracking biodiversity and nature conservation initiatives, for example, requires transforming qualitative assessments into quantitative metrics. That's no small feat. All nature is local, making it difficult to create a global metric.

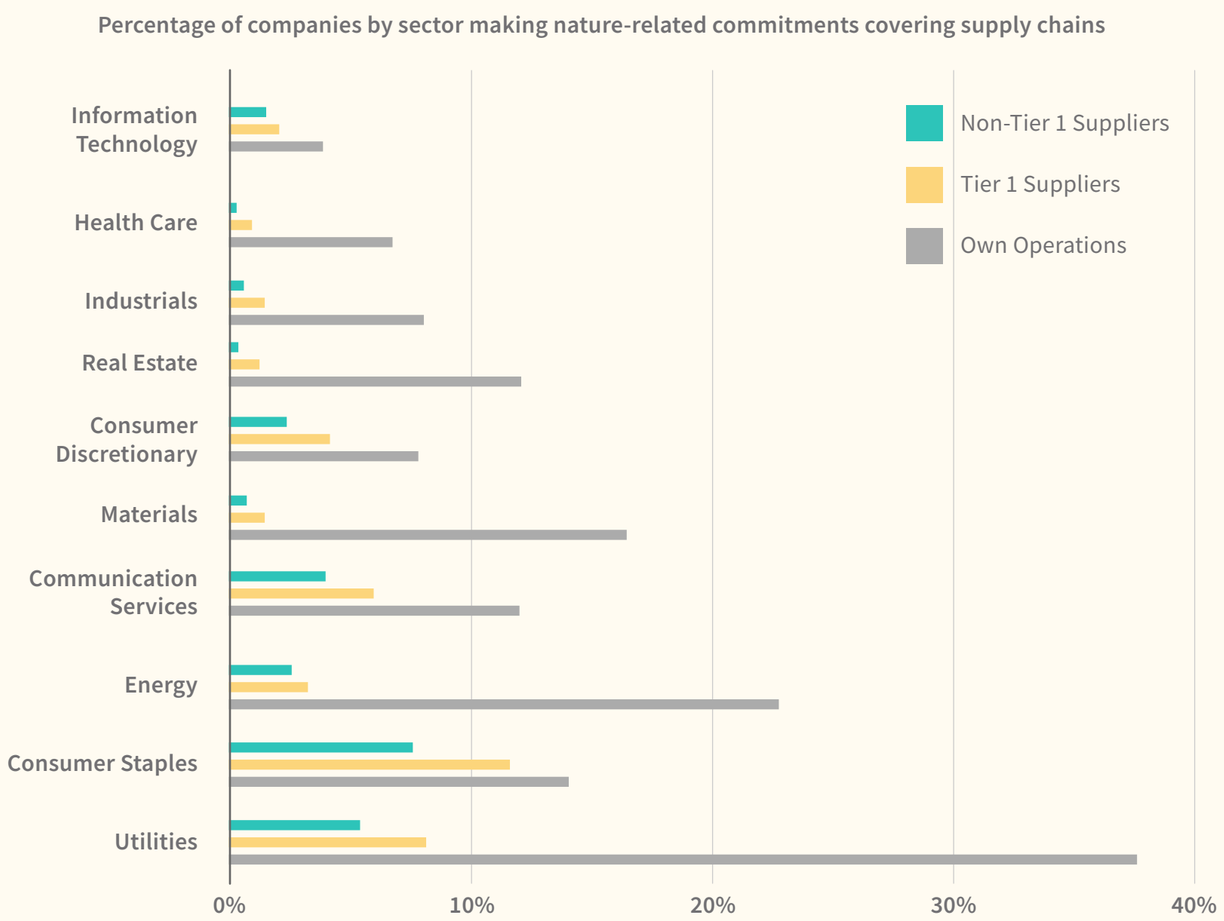
Some work is already being done to help companies measure and track such abstract attributes. The UN Convention on Biological Diversity met in December to create the equivalent of a 1.5-Celsius-degree pathway for nature. But unlike, say, greenhouse gas emissions, the target is not yet a number but this aspiration: "By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people."

A number of groups are working to change this imprecision. The Kunming-Montreal Global Biodiversity Framework includes some targets, such as bringing the loss of areas of high biodiversity importance close to zero by 2030, as well as conserving or restoring 30 percent of land by 2030, but even these leave plenty of room for interpretation.

Meanwhile, the Science Based Targets Network is planning on publishing

guidance in early 2023 for setting targets for land and water conservation. The quantitative metrics companies will be asked to use and report on are built off five main drivers of nature loss: land-use change; climate change; pollution; natural resource use and exploitation; and invasive species.

Nature-related Commitments Rarely Extend to Supply Chains



Source: S&P Global Sustainable1. Data as of November 2022. *Tier 1 suppliers directly supply goods, materials or services (including intellectual property or patents) to the company. Non-Tier 1 suppliers provide products and services to the supplier at the next level in the supply chain (i.e. Tier 2 or lower). Results based on responses from 3,753 companies assessed in the 2022 S&P Global Corporate Sustainability Assessment.*

The idea is to take a qualitative statement such as "stopping land conversion" and turn it into actionable numbers, such as acres of natural habitat or species of birds on a given property.

And some first movers have already started down this path. In 2020, the French luxury brand company Kering committed to becoming nature positive by 2025 and launched a regenerative agriculture program for 1 million hectares of land. But of course, nature positive remains a buzzword that needs an exact definition. The Coca-Cola Co. has invested in protecting watersheds including providing funding for technical expert training in Guatemala to help local communities and farmers protect against deforestation. But these one-off projects need to become embedded into everyday business. IKEA's 2030 Forest Positive Agenda commits to sourcing timber from deforestation-free suppliers.

As for the social side, after the increased focus on diversity and inclusion in 2020 and, more recently, the growing emphasis on the social aspects of ESG, measuring the impacts of companies on people and communities will be the next frontier. The Capitals Coalition's Social and Human Capital Protocol uses factors such as living wage, health and safety reports, number of job trainings, access to unions and other countable instances. This year, the coalition plans to release an integrated protocol that links its nature and human capital protocols, which could be a major step forward.

These initiatives should help companies measure the unmeasurable and, along the way, provide more tangible appraisals that they and their stakeholders can use to assess progress.

Jesse Klein *is senior editor at GreenBiz Group*

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Alternative Protein Beefs Up for the Mainstream

BY THERESA LIEB

Browsing supermarket shelves, consumers can find a dazzling array of products, from ice cream to sausages and prepared meals to protein bars without animal-based ingredients. The alternative protein industry has written a tremendous success story — evidenced not only in stores but also by the $5 billion in disclosed investments companies secured in 2021, a fivefold increase from just three years ago.

Alternative protein backers have long extended beyond companies such as Impossible Foods and Beyond Meat to the world's largest food companies — including Nestlé, Unilever and Mars as well as meat giants such as Tyson and Cargill. And yet, the industry can't prove that it has saved a single animal or avoided notable carbon emissions because its products aren't replacing conventional meat, dairy and eggs in omnivores' shopping baskets.

Instead, food companies may just be spicing up the bean and tofu rotations of vegans and vegetarians. While these are nice-to-have customers, alternative proteins can only fulfill their promise to slash the food systems' greenhouse gas emissions by getting mainstream meat eaters to substitute at least some of their steaks, chops and burgers with plant-based alternatives. In 2023, food purveyors will accelerate efforts to capture those consumers.

What needs to give? Taste, perception and price.

Many of today's plant-based foods don't live up to the taste and texture of the products they're meant to replace, so the industry is expanding its toolkit. Dairy from precision fermentation and mushroom-based meats made big waves in 2022. The star of 2023? Cultivated products from real animal cells, but for which animals were not killed or otherwise harmed.

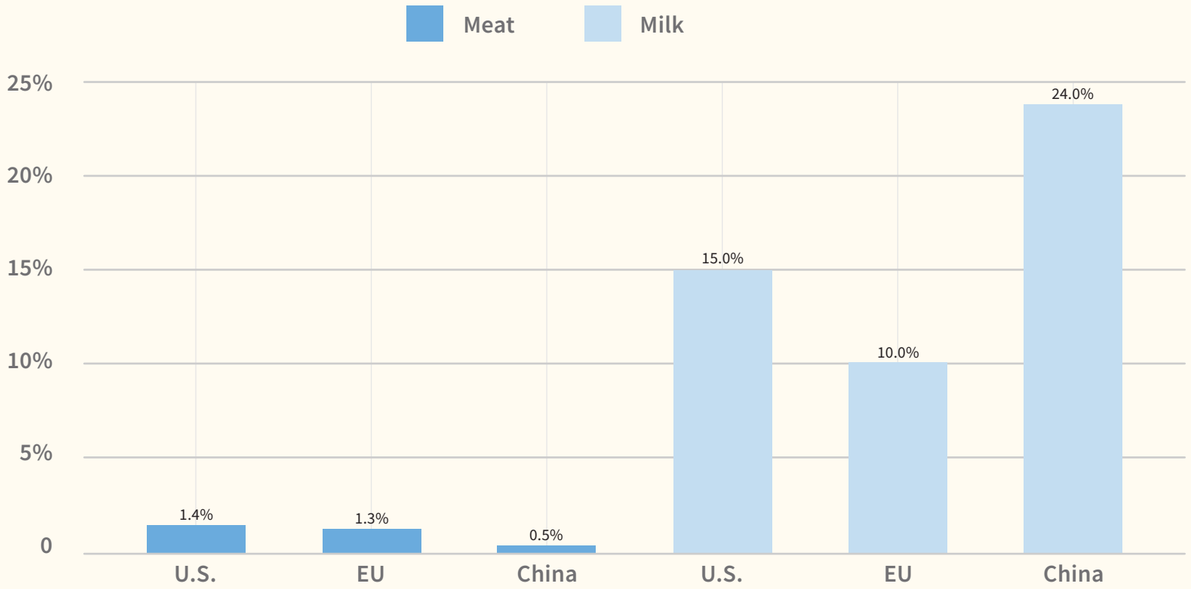
Such cultivated meats will show up more often as ingredients than pure products. For example, while some companies will create premium offerings such as cultivated steaks, many others will likely create hybrids — say, Mission Barns' plant-based chorizo sausage that contains a sprinkle of cultivated animal fat to make the taste and texture more like the real thing.

Call it alt-protein 2.0.

As flavor and mouthfeel improve, companies will also revamp product perception, drawing on the rich lessons learned during alt-protein 1.0. Rather than touting their foods as planet and animal saviors, the industry will likely put taste front and center and place their products where they belong — in supermarket meat aisles and chef specials rather than in separate vegetarian or vegan sections.

For example, Eat Just started promoting its plant-based eggs simply as "really good eggs" in celebrity-backed ad campaigns last spring. New York City's hospitals successfully introduced plant-based lunches for patients by marketing them as the "Chef's Special."

Plant-based Meat and Milk Share of Total Retail Sales In U.S., EU and China in 2020



Source: IHS Markit, now a part of S&P Global

Yet none of these efforts will succeed if prices don't come down. And that may be a lot for food companies to swallow. Heavy subsidies, large-scale production and environmental externalities make conventional meat, milk and eggs inexpensive. To compete, alt-protein companies must improve their economies of scale by reaching beyond the startup funding community to gain support from governments, large-scale investors and big food companies.

Jeremy Coller, a British investor and philanthropist, is helping the industry reach new shores. With the FAIRR Initiative, he's guiding a $69 trillion investor network to account for the ESG risks associated with intensive animal agriculture. In turn, FAIRR and the Good Food Institute launched an ESG framework for alternative protein companies, fostering the industry's transparency. With clear-cut comparisons at hand of the risks in conventional and alternative protein portfolios, more investors may earmark future funds for the latter.

Governments also increasingly understand the case for supporting protein research and manufacturing. Resource-constrained countries such as Singapore and Israel have long led the way. U.S. President Joe Biden signed an executive order to launch a national biotechnology and biomanufacturing initiative in September that, among other goals, aims to improve food security by supporting cultivated meat.

As these and other forces collide, alt-protein companies may finally stand a chance to make good on their promise of giving food shoppers healthier, more climate-friendly choices at competitive prices.

Theresa Lieb *is senior analyst, food systems, at GreenBiz Group*

Carbon Disclosure Becomes Mandatory

BY NETHRA RAJENDRAN

Carbon disclosure is being spotlighted on the international stage, with Belgium, Canada, Chile, France, Japan, New Zealand, Sweden and the United Kingdom among those requiring financial disclosures aligned with the Task Force on Climate-Related Financial Disclosure (TCFD). The United States will follow with the Securities and Exchange Commission's proposed rule, the Enhancement and Standardization of Climate-Related Disclosures for Investors, which posits that the climate crisis creates financial risks for companies, requiring them to disclose their emissions and prospects in a climate-changing world.

Some of the world's largest investors are on board. BlackRock, for example, released a statement in support of the U.S. rule indicating that the age of voluntary and unregulated disclosure is coming to a close. Others agree. "The business case has been made, and measuring climate risk and emissions is now seen as a preparedness tool," according to Elizabeth Small, general counsel and head of policy at the nonprofit group CDP.

With this transition to a mandatory disclosure world, a few developments are certain to follow. "Disclosure is a critical first step," said Steven Rothstein, managing director at Ceres. "It alone will not address the climate risks. We cannot solve this problem without having people and systems in place to measure it."

One expected development is an increase of companies hiring professionals and seeking technologies in support of what's called MRV — for measuring, reporting and verification — to keep up with the demand by regulators, investors and customers for accurate carbon disclosure data.

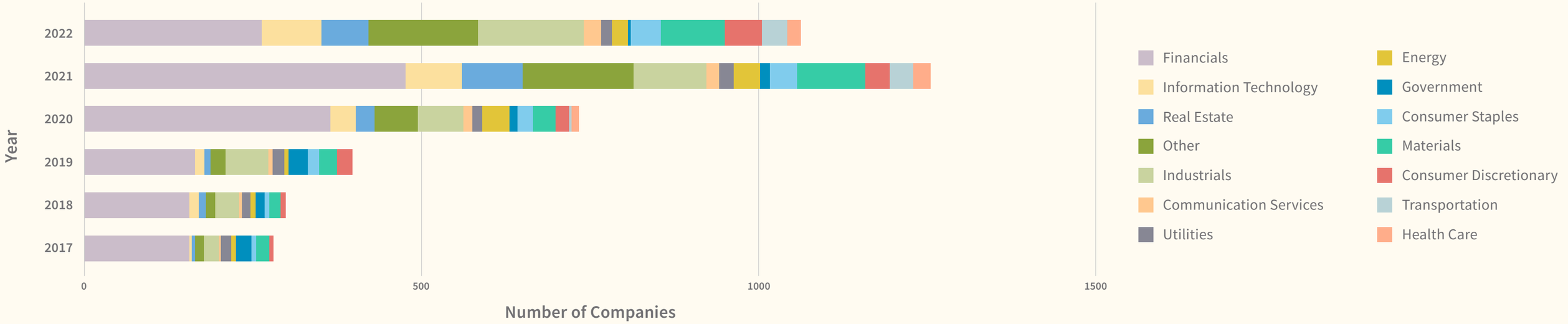
The landscape can be confusing, and it will affect companies in different ways. Overall, there will be stricter standardization aimed at decreasing the mispricing of climate risk by investors and ensuring data that companies provide is comparable and "decision-useful." TCFD and the GHG Protocol, which standardized greenhouse gas reporting, will serve as the foundational principles for future reporting practices. Key players such as the

International Sustainability Standards Board will play an integral role in managing and auditing these standards to further harmonize climate data outputs.

Scope 3 emissions — those from supply chains and customer use — are an infamously difficult topic within disclosure because they require gathering accurate data from suppliers and suppliers' suppliers, reaching all the way back to raw material extraction. Prepare to see an increase in regulations and disclosure expectations around this, too, in the near future.

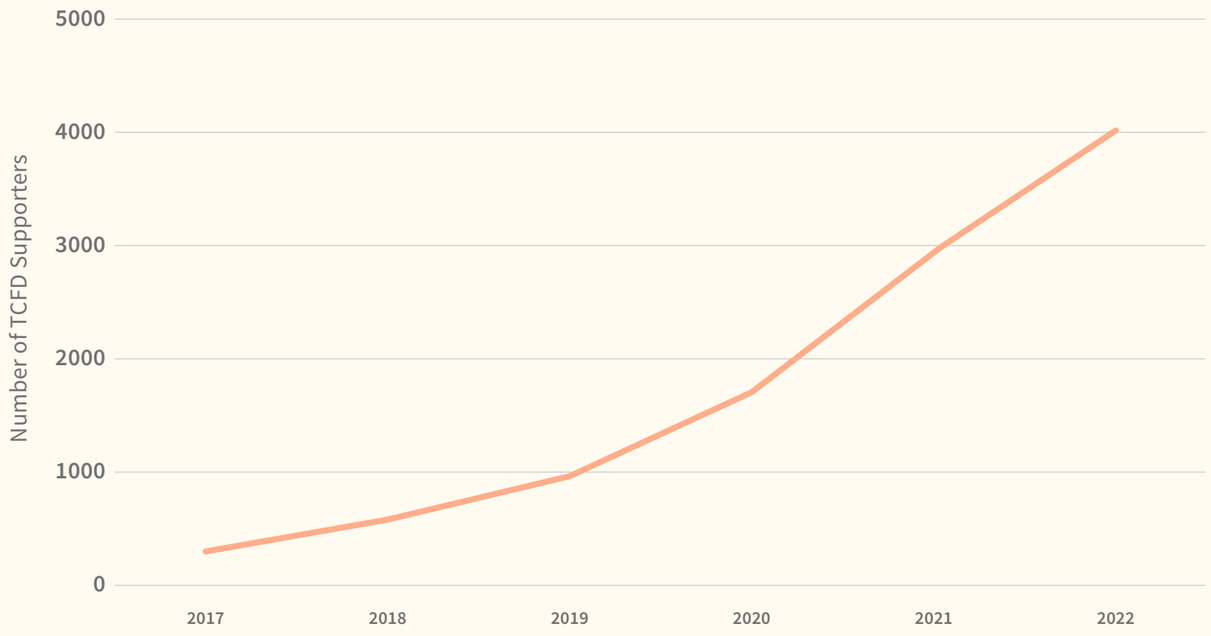
Corporate carbon disclosure in the United States is expected to get a boost from the Federal Supplier Climate Risks and Resilience Proposed Rule, which leverages the government's procurement power to build accountability

Thousands of Companies Announced Support for TCFD the Past 2 Years, with the Financial Sector Leading the Pack

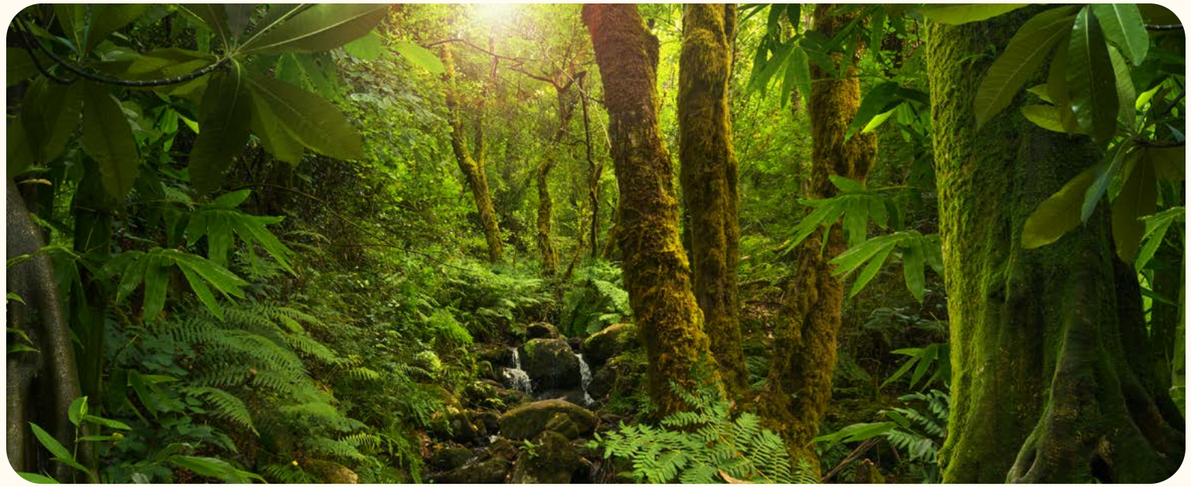


Source: S&P Global Sustainable1; TCFD. Data as of November 2022. *Analysis based on the Task Force on Climate-Related Financial Disclosures (TCFD) website list of supporters across sectors globally. "Support" indicates that an organization believes the TCFD recommendations provide a useful framework to increase transparency on climate-related risks and opportunities within financial markets.*

Steady Growth in Number of Companies Supporting TCFD



Source: TCFD, 2021 *Analysis based on the Task Force on Climate-Related Financial Disclosures (TCFD) website list of supporters across sectors globally. "Support" indicates that an organization believes the TCFD recommendations provide a useful framework to increase transparency on climate-related risks and opportunities within financial markets.*



within its supply chain. It calls for federal suppliers and contractors with over $7.5 million in annual government contracts to report their Scope 1 and 2 emissions, and suppliers with over $50 million in annual contracts to report Scope 3 emissions and set science-based emissions targets.

While significant gaps in Scope 3 disclosure remain within these proposals, “we can expect to see Scope 3 emission accountability and disclosure skyrocket in the coming years because of the magnitude of their impacts,” said Pankaj Bhatia, the World Resources Institute's GHG protocol global director.

The tide is changing, and fast. Companies that move with the currents, rather than waiting to make changes after regulations become law, will find smoother sailing as disclosure becomes mandatory.

Nethra Rajendran *is net zero analyst at GreenBiz Group*

Water Tech Catches a Wave

BY HEATHER CLANCY

"Climate change is the problem, but water is the messenger." So observes Jose Ignacio Galindo, co-founder and CEO of San Francisco-based Waterplan, an early-stage software firm helping Amazon, Anheuser-Busch InBev, Coca-Cola, Colgate-Palmolive, Danone, Diageo, McCain and Meta understand their operational impact on watersheds where they do business.

Waterplan represents a new generation of "aquapreneurs" focused on industrial and commercial water applications. From planning tools to advanced wastewater filtering and recycling systems to freshwater generation technologies, these startups are thirsty for funding and finding more investors willing to fill their cups as 2030 looms.

Just ask Boston-based superfiltration company ZwitterCo, which disclosed a $33 million Series A funding round in September — the biggest early-stage infusion to date for water tech. ZwitterCo makes membranes for treating wastewater contaminated with oils, fats, greases or proteins. Often, companies have this water hauled away at considerable expense. Now, they have another option. "The water reuse story is something that resonates," says ZwitterCo CEO and co-founder Alex Rappaport.

Historically speaking, venture capital flowing into water technology has been a trickle rather than a flood — an estimated $470 million in 2021. That's a mere drop in the bucket compared with the $27 billion invested in climate tech in the first half of 2022 alone. The category barely rates separate consideration — solutions for stormwater abatement, wastewater treatment, pipe maintenance, irrigation and so on are often categorized as agtech or urbantech or industrial tech, which include non-water technologies. But money is gushing into digital water technologies, in particular, with Bluefield Research predicting global spending for that segment alone to double to $55.2 billion in 2030, from $25.9 billion in 2021.

Innovation across all applications is coming from all over the world. Just three examples: Chemical-free purification systems from Singapore-based Pure Active Water (Dole is a customer); mobile wastewater treatment equipment

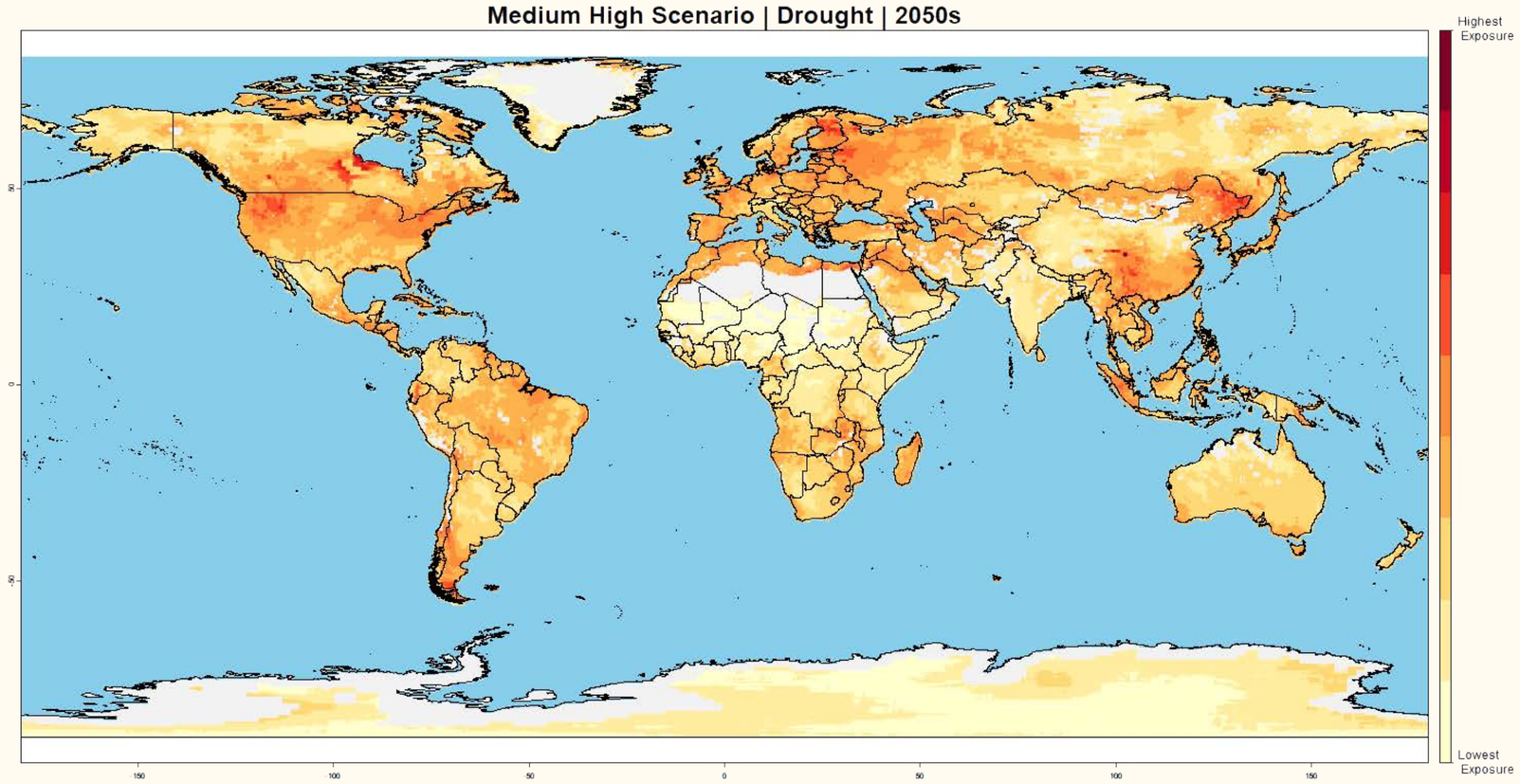
from Indra Systems in India (being used by local textile-makers and biorefineries); and real-time monitor of discharge from Canadian firm Island Water Technologies (used by pulp and paper companies).

The startup activity coincides with a new wave of interest in water risks among corporations, and not just with the usual suspects in food, beverage and agriculture. Tech companies Amazon, Google, and Meta — which aspire to become "water positive," regenerating sources from which they use water — are investing in reducing water consumption at their thirsty data centers. Procter & Gamble is vowing to source 5 billion liters of water from water recycling and reuse systems at its facilities. (It's more than halfway there.) Even Elon Musk has water on the brain: The opening of Tesla's factory in Germany in early 2022 was delayed over concerns about the long-term water supply.

"Water is only going to get more important," says Tom Ferguson, managing partner at Burnt Island Ventures, a firm focused exclusively on water entrepreneurs. Ferguson says water startups are particularly interesting for organizations concerned about adaptation alongside mitigation. "Climate change is water change."

Heather Clancy *is vice president and editorial director at GreenBiz Group*

Projected Drought Hazard Exposure in the 2050s Under a Business-as-Usual Scenario



Projected drought hazard exposure in the 2050s under a business-as-usual scenario. The BAU scenario is represented by SSP3-7.0 and is characterized by limited mitigation where total greenhouse gas emissions double by 2100 and global average temperatures rise by 2.8-4.6C by 2100. Drought hazard is quantified as the projected number of days where the self-calibrating Palmer Drought Severity Index (scPDSI) is less than or equal to the historical 10th percentile.

Source: S&P Global Sustainable1. Data as of November 2022.

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Natural Capital Earns Investor Interest

BY GRANT HARRISON

In economic terms, climate change is the result of a massive externality: an unpriced element in the production, consumption and transportation of goods and services. Fossil fuels are a primary ingredient in the eye-popping economic growth of the past two centuries, but the cost of burning them wasn't originally factored into the equation.

Increasingly, that's changing.

Institutional investors across the globe are taking stock of natural capital, which national economies and investors have historically neglected.

Investing in natural capital — the value extracted from soil, air, water, climate and all the living things and ecosystem services that make the economy possible — has long made environmental sense. Examples include advancing sustainable hydroponics, beef alternatives, biodegradable consumer products or degraded land restoration.

But investors are increasingly seeing the economic rationale, too. The World Economic Forum estimates that protecting nature and protecting biodiversity could generate $10 trillion annually in business opportunities, from farming to fashion to finance, creating nearly 400 million new jobs.

The question is how, exactly, all this happens. The year ahead could provide some answers.

A key stepping stone is the ongoing development of the recommendations of the Taskforce on Nature-related Financial Disclosures (TNFD), due in fall 2023. The TNFD framework is meant to bridge the information gap that exists between financial institutions and companies — in this case, providing the information needed to understand how nature-related risks impact financial performance.

The International Finance Corporation's (IFC) Biodiversity Finance Reference Guide, launched in 2022, which builds on the International Capital Market Association's green bond and green loan principles, launched in 2014 and

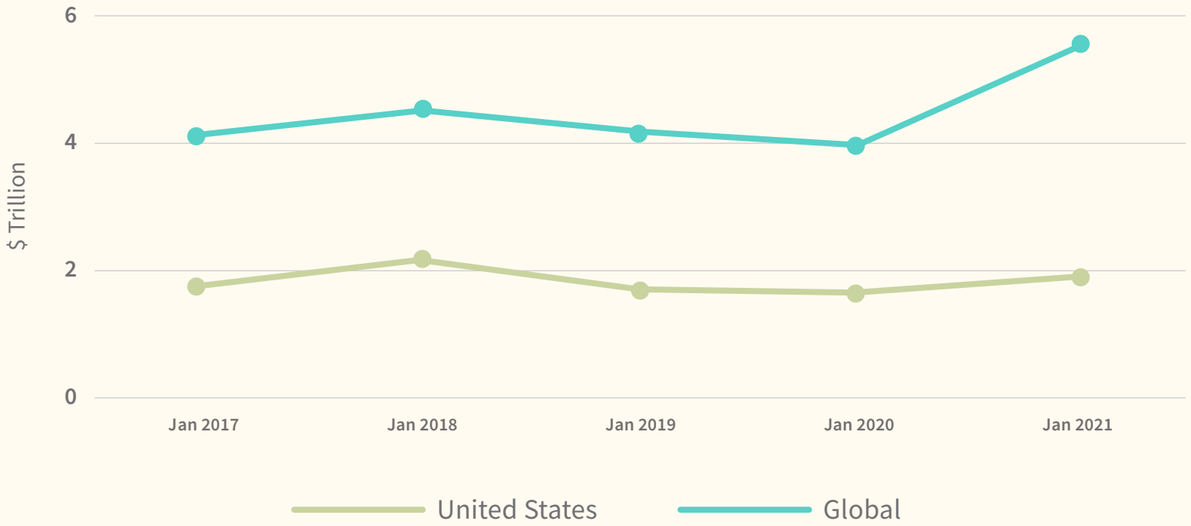
2018 respectively, also serves as a key stepping stone.

The IFC's guide provides investors an overview of the types of investments that support natural capital. It is one of several organizations and collaborations working globally on some aspect of valuing nature for companies, including the Capitals Coalition, the Natural Capital Investment Alliance and the United Nations Environment Programme Finance Initiative.

So where's the money?

In 2020, the OECD estimated biodiversity finance from all sources to total between $78 billion and $91 billion per year.

Natural Capital Costs Climbed after a Slight Decline During the Start of the Pandemic



Source: S&P Global Sustainable1. Data as of November 2022.
Analysis based on the S&P Global Trucost Environmental dataset and S&P Capital IQ net income data, showing the five-year trend in natural capital costs for global companies (those in the S&P 1200) and U.S. companies (those in the S&P 500). Natural capital is the dollar value of resources extracted and pollution emitted.

And as of this writing, the largest investment strategy with a healthy ecosystems theme was the nearly half-billion-dollar-and-growing Fidelity Select Environment and Alternative Energy fund (FSLEX), although similar funds are poised to expand greatly across North America, EMEA and APAC throughout the coming year.

As major investment firm leadership at the likes of Schroder's, Aviva and RobecoSAM have become vocal about the role biodiversity plays in their funds' strategies and holdings, it's safe to expect some of the billions invested with a dual mandate on climate — that is, simultaneously seeking returns and climate impact — will increasingly be informed by biodiversity mandates, too.

That the financial sector has begun to realize that nature's economic value is wholly dependent on a healthy climate may sound eye roll-worthy to some in the climate community, but this fact says more about the financial system's lack of consideration for the value of natural resources than it does a lack of investor ambition. Regardless, the estimated $10 trillion dollar investment opportunity is likely to become a focusing factor.

The practical upshot: There is no path to decarbonization without major investments in natural capital. If the climate crisis truly is the largest investment opportunity in a generation, investing in natural capital is destined to become core to that opportunity.

Grant Harrison *is director and senior analyst, sustainable finance and ESG at GreenBiz Group*

Carbon Tech Captures Billions in Funds

BY LEAH GARDEN

Carbon removal technology is capturing more than just greenhouse gases. It's also sucking up billions of investor dollars.

After debuting 50 years ago, carbon tech — technologies that capture, store and use emitted carbon; reduce emissions from other sectors; or monitor physical assets containing stored carbon — was long considered too expensive and inefficient to be a viable climate solution. But the skyrocketing number of venture capital (VC) deals in 2022 (plus the sobering reality that eight years remain to halve global emissions in line with the Paris Agreement) awakened carbon tech funding from its slumber. Now it's the tech sector to watch.

Carbon tech raised $10.7 billion in VC investments across 517 deals in the first three quarters of the year, according to Pitchbook's 2022 Carbon & Emissions Tech Report, including standout deals such as Climeworks $634.4 million Series F funding, Carbon Clean's $150 million Series C funding and Twelve's $130 million Series B funding. (Compare that to $3.2 billion for all of 2019.) This growth is due to a few factors, such as the passage of new federal laws, the promise of carbon-intensive industries to invest in mitigation tech such as point source carbon capture, and the expanding potential of the up-and-coming carbon market.

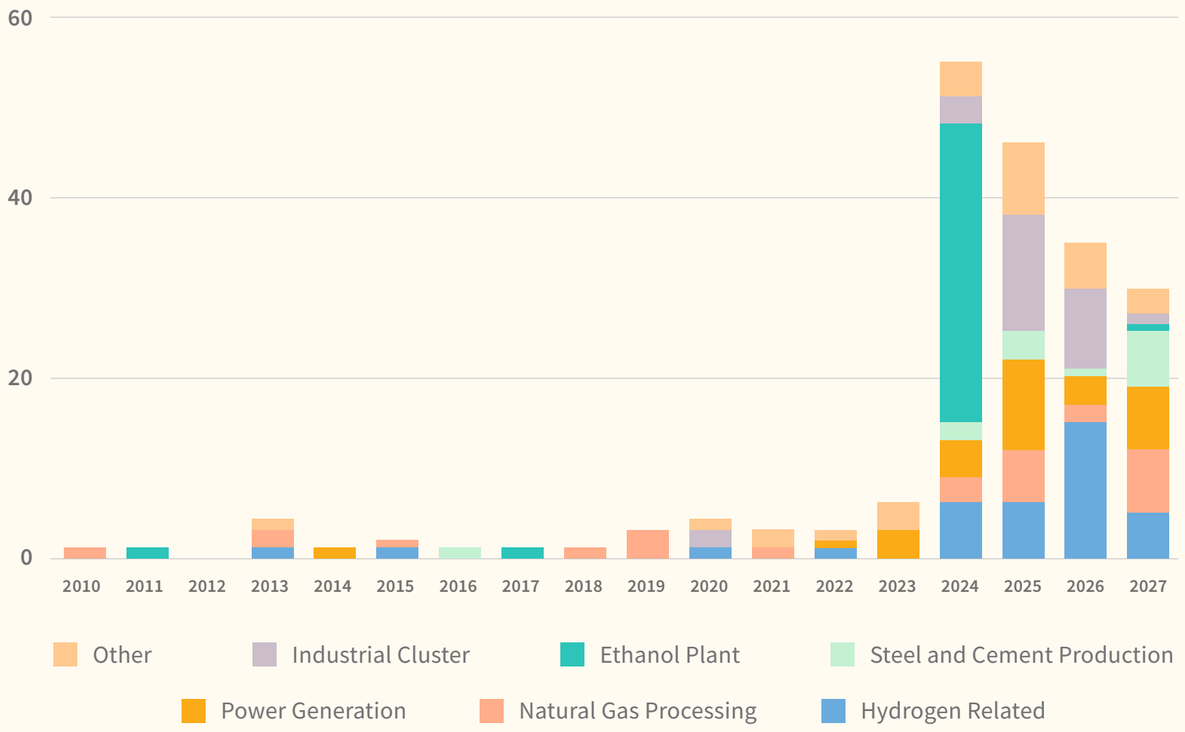
Experts from Breakthrough Energy Ventures, Pitchbook and the Carbon Business Council all informed GreenBiz that the passage of the Inflation Reduction Act in the United States will encourage investors to increase spending on carbon capture ventures and will undoubtedly catalyze future boosts in funding. But "the real impetus for the explosion in carbon tech is the 45Q increased amendments," explained Jack Andreasen, manager of carbon management policy at Breakthrough Energy Ventures.

The U.S. federal 45Q tax credit originally allotted carbon tech companies $50 per ton of carbon captured and stored, but the initial incentive, according to Andreasen, was too low to create sustainable revenue streams. The 2022 amendment from the IRA boosts those returns to as much as $180 per ton while lowering the project eligibility threshold, unlocking a

financially lucrative market for more companies.

Large oil and gas producers, including Occidental Petroleum and Talos Energy, are also financially committing to the long-term economic potential of carbon tech. ExxonMobil recently signed a $2.5 billion agreement with Indonesia's state-owned energy company to develop a carbon capture sequestration hub in the country, supporting its national 2060 net-zero goals.

CCUS Project Additions by Year



Source: "The S&P Global carbon sequestration projects and policies overview report," S&P Global Commodity Insights Data as of November 2022.

But fossil fuel investment in carbon tech is not without controversy. The practice provides the option to purchase carbon offsets in place of reducing actual emissions and extends the life of fossil fuels, creating a dilemma akin to a double-edged sword. Large fossil fuel producers use their wealth to invest in much-needed carbon tech R&D, thereby contributing to further technological innovation that can be used across industries.

And those same oil and gas companies then subsequently use the technology they funded to extend the long-term viability of fossil fuels, all while seemingly espousing commitments to climate mitigation. Additionally, captured carbon is pressurized and injected into the earth to flush out crude oil, another reason oil companies will likely continue investing in carbon tech for the foreseeable future.

This duplicitous trend from fossil fuel companies is likely to continue so long as the demand remains, aided by oil and gas companies' use of greenwashing practices and industry lobbying. Emissions-heavy industries, including steel and cement production, will also continue to require external inputs to decarbonize their supply chains in lieu of less carbon-intensive practices.

Even so, carbon capture remains a key technology that can bridge the transition between fossil fuels and renewable energy. Thus, carbon tech in 2023 will remain a vital and lucrative sector in which to invest.

Leah Garden *is climate tech reporter at GreenBiz Group*

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Business Model Innovation Accelerates Circularity

BY JON SMIEJA

Supply chain shortages, a hunger for critical minerals and a planet stretched to its breaking point. These macro trends have kneecapped whole industries over the past few years. That's leading companies to rethink how we make, sell and interact with products.

Enter the vast opportunity of business models that can decouple growth from extraction.

Some of these models have been profitable for decades. Examples of remanufacturing in practice are Davies Office (furniture), John Deere (farm equipment) and Caterpillar (construction equipment). Others, such as clothing resale, have been a small part of their sector for ages (such as thrift shops), but are growing quickly through both independent platforms and directly through brands. Pilots and experiments abound in this space, but there's still plenty of room for innovation.

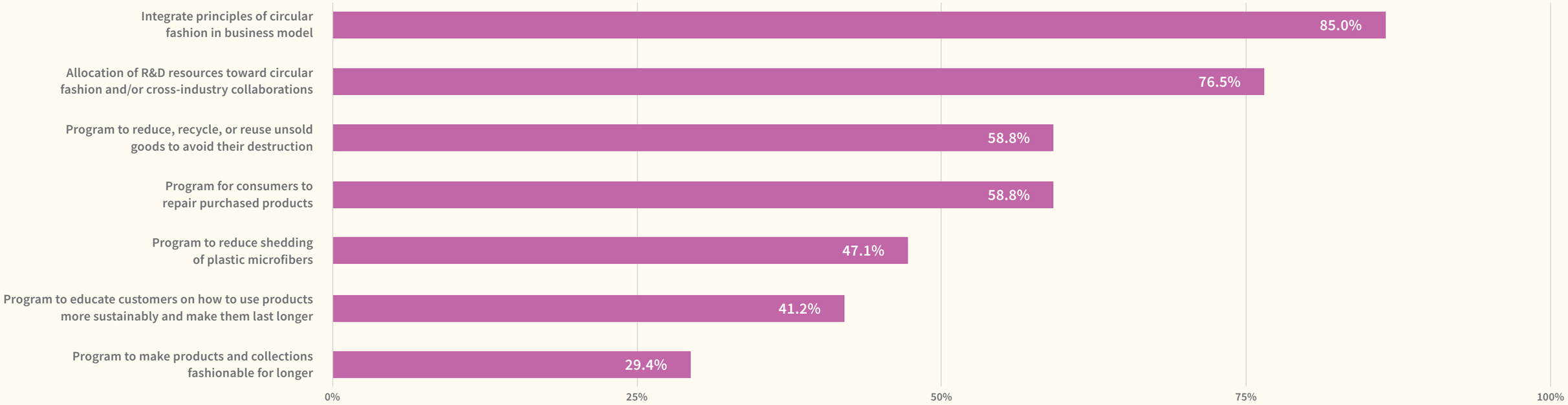
One business model innovation could be called "redesign and rethink." It's a combination of product design and business model innovation working hand-in-hand. If products are redesigned for circularity, the concept goes, then offered through subscription services or with takeback programs, they can be recovered and put back into productive use or recycled. A recent example is the On CloudNeo shoe made from a single material and offered only through subscription. Look for growth in this space as more companies experiment. The difficulty will come as companies like On try to scale, which requires cooperation and reverse logistics hubs.

Another innovation is a return to the past; call it the "milk bottle method." New brands and old stalwarts alike are working to scale up refill and return models to reduce packaging and deliver only what's needed to customers. Still another shift in business models includes grocery store chains increasing space devoted to bulk items and partnering with brands to deliver new refill options for shoppers. In both cases, the biggest challenge may be overcoming the customer's desire for the convenience they've grown accustomed to with packaged and (heretofore) disposable products.

A third model might be called the “Ouroboros.” This option, where a company becomes its own supplier, could be a game-changer in spaces where there is currently no next life for products. One example is the investment major roofing companies such as GAF and Owens Corning are putting into recycling asphalt shingles. While work is still to be done to improve the processes, these investments hold promise to bring new value to an entire waste stream. Similar opportunities exist for electronics, apparel and a number of other industries where reliable recycling infrastructure is lacking.

While 85% of Clothing Companies Integrate Circular Fashion in Their Business Model, Fewer Have Programs to Reduce, Recycle or Reuse Unsold Goods

Percentage of companies in the Textile, Apparel and Luxury Goods industry that report using different programs for circular fashion



Source: S&P Global Sustainable1; TCFD. Data as of November 2022.
Results based on responses from 20 companies in the Textile, Apparel and Luxury Goods industry assessed in the 2022 S&P Global Corporate Sustainability Assessment.
R&D = research and development

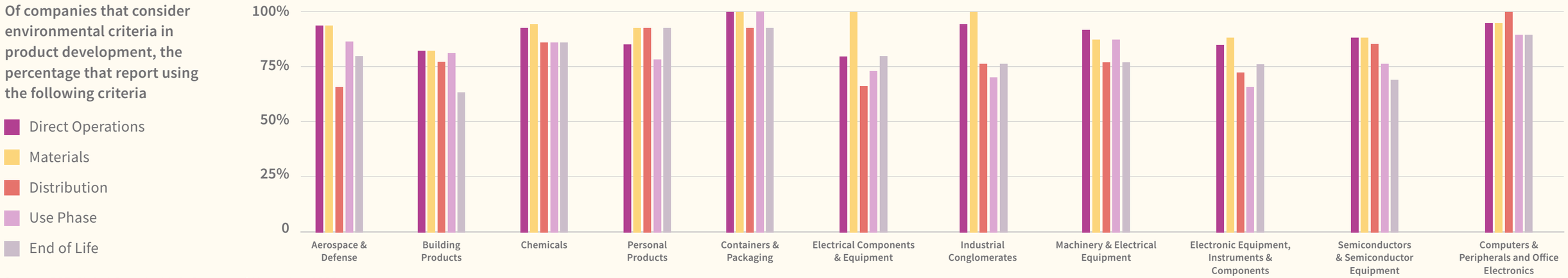
Automakers Take the Lead with Products Sold That Can Be Reused or Recycled

Source: S&P Global Sustainable1. Data as of November 2022.
Results based on responses from 200 companies assessed in the 2022 S&P Global Corporate Sustainability Assessment.

For a circular future to become a reality, companies must redesign products and embrace new relationships with customers. That's particularly true in apparel and electronics due to the increased public awareness about the massive waste in both sectors. Transitions toward refill and reuse in food packaging and household items, while much needed, may come more slowly due to the challenge of overcoming convenience biases among users. The question of how to get from here to there is an open one, but we are looking forward to progress.

Jon Smieja *is vice president of circularity and senior analyst at GreenBiz Group*

Companies Focus on Direct Operations and Sourcing Materials When Considering Environmental Criteria in Product Development



Source: S&P Global Sustainable1. Data as of November 2022.
Results based on responses from 306 companies assessed in the 2022 S&P Global Corporate Sustainability Assessment.

Geothermal Energy Heats Up

BY SARAH GOLDEN

If we could capture just 0.1 percent of the heat content of the earth, we could supply humanity's total energy needs for 2 million years, according to the U.S. Department of Energy. Yet geothermal currently accounts for just 0.4 percent of total U.S. utility-scale electricity generation, nearly half of which came online in the 1980s. Investments dried up with the rise of solar and wind, which required less upfront capital and became increasingly economically attractive.

That trend is set to change. Corporations and localities worldwide are looking to decarbonize electricity, matching energy demand with clean energy supply — a concept often referred to as 24/7 carbon-free energy. This, coupled with technological advances, has poised geothermal for growth.

While wind and solar have been technological success stories — providing the cheapest electricity on a levelized cost basis — they are also intermittent. The quest for carbon-free energy is changing the economics of geothermal as an energy resource not beholden to weather patterns is worth more than an intermittent power source.

Early corporate movers, such as Microsoft and Google, are inking geothermal procurement deals, as are some local U.S. utilities, such as East Bay Community Energy and Clean Power Alliance, operating where regulators require clean resources that are not weather-dependent. In Europe, an urgency to decouple from Russian gas is inspiring new geothermal plants where resources are strong, as in Croatia.

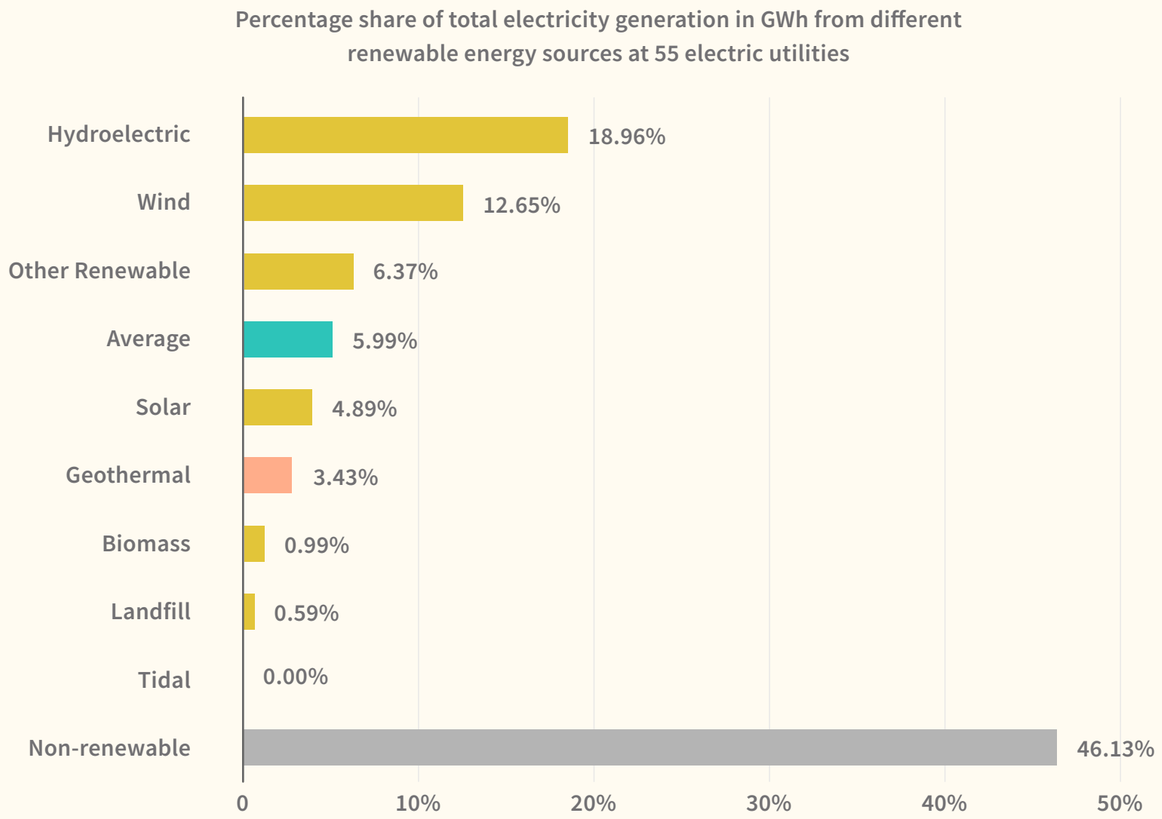
These deployments will help develop the contract and financing models to drive down the costs of geothermal. The Inflation Reduction Act in the United States is allowing geothermal to qualify for the same tax credits as wind and solar, which will help attract new capital and contracts.

Meanwhile, innovators are inching toward breakthroughs to make geothermal easier and cheaper. Those bullish say addressing the technological barriers could catapult geothermal to become upwards of 20 or 30 percent of the

global energy mix. Emerging challenges and solutions in two areas include:

Locating easy-to-access resources. Historically, identifying fruitful geothermal resources has been difficult, and drilling in the wrong location is costly. Zanskar, a startup in Utah, is using big data to create models to locate geothermal resources.

Geothermal Is Catching Up With Solar, but Wind and Hydroelectric Remain Dominant in the Renewable Electricity Generation Mix



Source: S&P Global Sustainable1. Data as of November 2022.
Results based on responses from 55 companies in the Electric Utilities industry assessed in the 2022 S&P Global Corporate Sustainability Assessment.
GWh = gigawatt hours

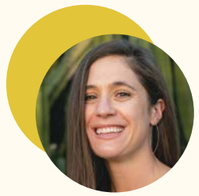
California startup Fervo Energy approaches this from another angle. The company uses horizontal drilling and distributed fiber-optic sensing to tap into energy at previously uneconomic locations.

Enhanced geothermal systems. New technologies are delving deeper to reach superhot rocks, making the high heat needed to generate electricity available in more locations, not just geologic fault lines. Superhot rock systems have another benefit; if the heat of the well increases by 42 percent, the system can produce 10 times more energy.

Startups are looking for new ways to drill deeper. Quaise Energy out of Boston is refashioning millimeter-wave drilling techniques, used for nuclear fusion experiments. Oregon-based AltaRock is exploring laser beams to reach deeper, hotter energy resources.

Meanwhile, policies in the U.S., Europe and Asia are incentivizing breakthroughs and fuelling innovation. The U.S. federal government, which has set a goal of 50 percent carbon-free energy by 2030, issued an Energy Earthshot to reduce the cost of enhanced geothermal by 90 percent by 2035. In Indonesia, the government is underwriting the exploration of prospective fields to absorb risk. Lawmakers in the Philippines are allowing large-scale projects to be owned by foreign developers, an exception to cosmetic ownership requirements, to encourage further geothermal development.

Taken together, the time is right to call up this energy resource that for too long has been a benchwarmer in the renewable energy lineup.



Sarah Golden *is vice president of energy at GreenBiz Group*

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About GreenBiz Group

GreenBiz Group is a media and events company that accelerates the just transition to a clean economy. Through events that galvanize, stories that amplify, peer networks that bond and industry-leading analysis, we define markets and advance opportunities at the intersection of business, technology and sustainability. We are a passionate team of people that builds and empowers communities to confront the threats of climate change and solve the thorniest challenges of our time.

GreenBiz recognizes the inextricable link between climate change and social change and works across its platforms to connect the dots between equity, inclusion and sustainability by centering justice as a cornerstone of a clean economy. We recognize the power of our platform and actively work to be intersectional in our content by prioritizing Black, Indigenous and people of color (BIPOC) across our conference programs and editorial coverage.

Our goal is to ensure that GreenBiz Group — and the industry — reflects the world that we live in, and the world we want to see.

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