

# State of Green Business 2021

By Joel Makower  
and the editors at GreenBiz

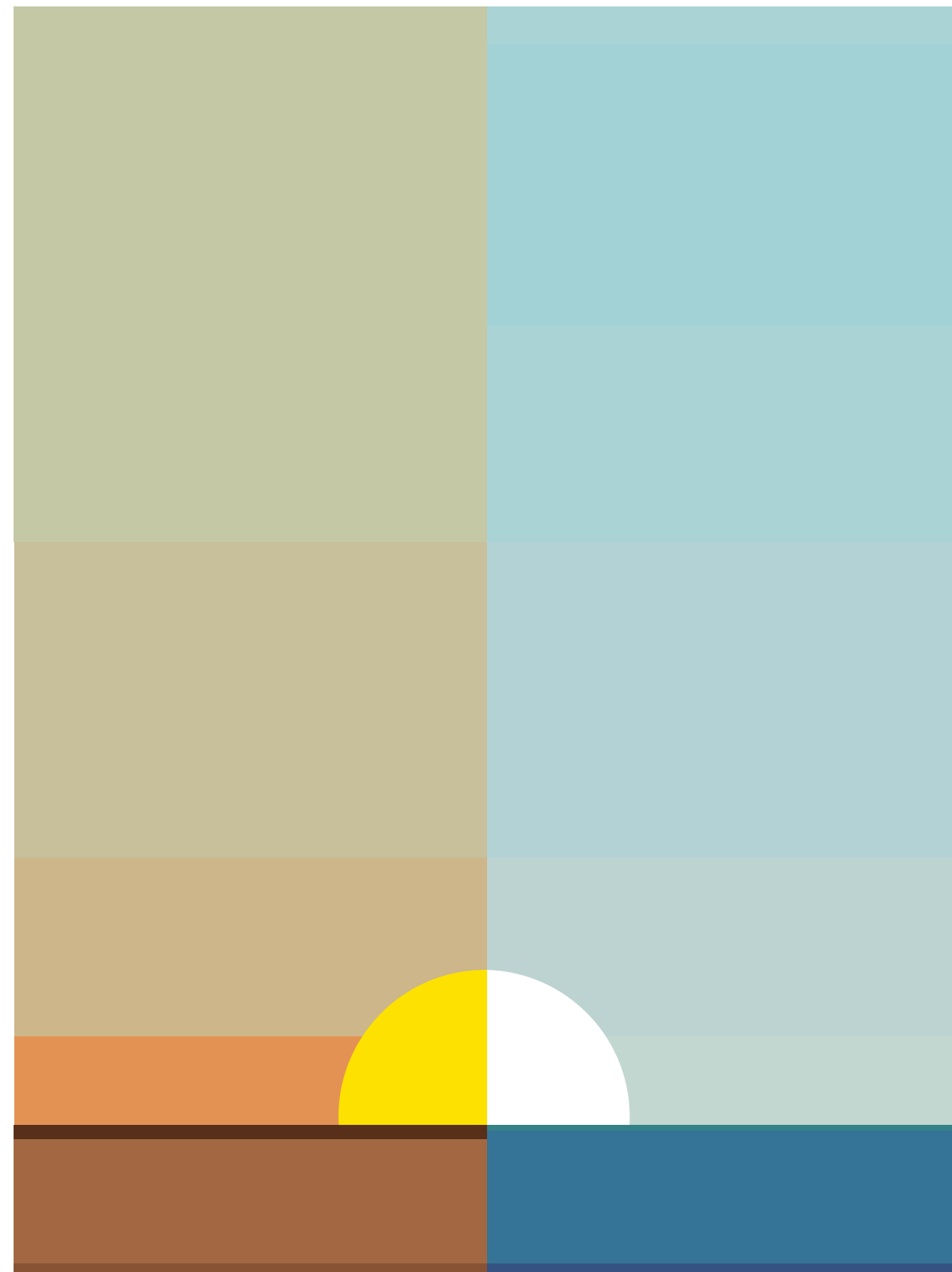
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# State of Green Business 2021

## Introduction

by Joel Makower

Chairman & Executive Editor, GreenBiz Group

There never has been a moment as opportune as this one to be talking about the intersection of business and sustainability. Our world has been rocked on several fronts, most notably by a global pandemic that has caused unspeakable carnage and hardship in every nation, none more so than the United States. Social unrest, the growing ravages of a changing climate,



increasing economic inequality, continued racial strife — all contribute to the feeling that the world is unraveling before our eyes.

At the same time, the world is turning to big institutions to take on these big challenges. Governments, nonprofits and companies are being asked to step up their commitments and leadership across the full range

of social and environmental issues. “Justice” is the new mantra — social, racial, climate, economic, environmental and others.

Tracking corporate progress on many of these issues has been the focus of the annual State of Green Business report, now in its 14th year. And while the emphasis has been primarily on environmental issues, the scope of this year’s report extends to include social impacts as well — how the environmental challenges we face affect the well-being of families and communities across the economic spectrum.

Once again, we have partnered with S&P Global Trucost, which has provided the metrics and analysis for the State of Green Business Index, which begins on page 88. While these metrics are lagging indicators, they nonetheless provide insight into the direction companies are headed — and whether the private sector is moving at the scale,

scope and speed necessary to address the challenges and seize the opportunities before us.

During 2020, amid the economic, social, political and public health crises we encountered, corporate sustainability continued to move forward. Indeed, somewhat paradoxically, it was given a lift by the attention paid to these other issues. Like sustainability, all are viewed as systemic challenges requiring massive shifts in how economies and societies operate, and in a way that not only takes care of those whose economic welfare may be at risk due to these transitions, but that expands opportunity for all. Thanks to COVID-19 and the other challenges we’ve encountered, the idea of rapid, large-scale global action now seems more than a mere pipe dream.

In this report, we look at how, and how much, the private sector is doing its part to lead the change.

All told, it's an encouraging story at a dispiriting time.

The march of progress in sustainable business continues inexorably, as the leading edge continues to push forward. During 2020, for example, the notion of net-zero climate (and other) commitments accelerated, to the point where "yet another" net-zero announcement was a non-story to those of us in the news business. Just a couple years ago, the idea was barely on our radar. A few years before that, zero-waste factories, sustainable finance and circular products and services were similarly seen as improbable, even exotic. Now, they're mainstream.

What will the next-next thing be in sustainable business? We offer some hints in the first half of this report, where we present 10 trends to watch in the year ahead. But we also love to be surprised, to watch trends emerge and become the new normal, seemingly out of nowhere. Of course, they don't just magically appear. They are the result of visionary leaders taking bold stands and doing

hard work over months and years.

The aforementioned State of Green Business Index makes up the balance of this report, looking back over the past five years on a wide range of metrics, including some new ones this year, such as how environmental, social and governance, or ESG, scores have aligned with companies' financial performance.

Looking forward, looking back: It's how we gain perspective and realign ourselves to the challenges and opportunities before us. We at GreenBiz Group have been doing that for more than two decades. It continues to be an inspiring, invigorating perch from which to watch companies, communities and systems of commerce evolve to meet the moment.

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

## Foreword

by Richard Mattison

Chief Executive Officer, S&P Global Trucost

The global COVID -19 pandemic put a spotlight on the value of environmental, social and corporate governance considerations in capital markets. Global sustainability market benchmarks outperformed mainstream indices and ESG investments achieved record inflows as mainstream funds suffered widespread losses. The long held belief of ESG pioneers that top ESG performing companies, with

their healthy balance sheets and advanced social license to operate, could be expected to show reater resilience to such market shocks bore out. Demand for ESG investing accelerated, along with the opportunity to derive more meaningful investment outcomes.

## ESG Capital Allocation Surges

According to the U.S. SIF Foundation's 2020 biennial "Report on US Sustainable and Impact Investing Trends," sustainable investing assets now total \$17.1 trillion, or 33 percent of the \$51.4 trillion in total U.S. assets under professional money management — a 42 percent jump from 2018.

A majority of asset owners around the world

actively integrate ESG factors into their investment process, according to a 2020 survey by Morgan Stanley Institute for Sustainable Investing. With nearly 95 percent of millennials being interested in sustainable investing, and 75 percent believing that their investment decisions could impact climate change policy, the growth in ESG investing is [likely to continue](#).

A further indication of the increased commitment to ESG factors in investment decision-making and ownership can be found in the number of organizations signing up to the United Nations backed Principles for Responsible Investment (PRI). As of September 2020, the PRI counted over 3,000 signatories with \$103 trillion in assets under management (AUM), up from just 63 signatories with \$6.5 trillion in AUM in 2006.

## **Disclosure and Reporting Increasing**

As of October 2020, more than 1,500 organizations had expressed their support for the Taskforce on Climate-related Financial Disclosures (TCFD), an increase of over 85 percent since June 2020. Nearly 60 percent of the world's 100 largest public companies support the TCFD, report in line with the recommendations, or both. On average across the recommendations, 42 percent of companies with a market capitalization greater than \$10 billion disclosed at least some information in line with each individual TCFD recommendation in 2019.

Supporting the adoption of the recommendations of the TCFD is a high priority for the PRI, and the organization announced that reporting against the governance and strategy indicators would become mandatory in 2020

for investor signatories. As a result, there was a [3.5x increase](#) in TCFD-based investor reporting to the PRI in the first quarter of 2020. This represented 2,097 investors, up from 591 in 2019.

Governments are also taking steps to make reporting mandatory. In September 2020, New Zealand announced that it will implement mandatory climate risk reporting in line with the TCFD recommendations, becoming the first country to do so. This was quickly followed in November 2020 with the UK announcing that TCFD climate risk reporting will become mandatory for large companies and financial institutions as early as 2021. In addition, in May 2020, Canada announced that businesses would be required to disclose their climate impacts and commit to making environmentally sustainable decisions in order to receive COVID-19 economic aid.

## **Building Back Better**

The COVID-19 pandemic has brought many weaknesses to the surface, in particular highlighting the destructive impacts of many business models on our natural resource base. [According to the OECD](#), for the economic recovery from the crisis to be durable and resilient, a return to business as usual and environmentally destructive investment patterns and activities must be avoided. Unchecked, global environmental emergencies, such as climate change and biodiversity loss, could cause social and economic damages far larger than those caused by the virus.

We now have an opportunity to take some of the lessons learned over the past year to create a better world by embracing a sustainable recovery. A crisis can generate

creativity and new ways to handle old situations. We will likely see more flexible working environments, the continued growth in the number and sophistication of digital collaboration tools and, based on recent evidence, increasing prominence of ESG considerations in the capital allocation strategies of financial institutions. We will need solutions to help restore ecosystems, enhance biodiversity protection and create additional jobs around the world to reduce inequalities.

Now, more than ever, integrating ESG goals into business and government strategies can be a critical driver of long-term success.



# Top Sustainable Business Trends 2021

by Joel Makower

*Glimmers of hope amid  
tough times*

Now, where were we?

A year ago at this time, we looked ahead and confidently saw more engagement, new initiatives and a continuation of the forward march of progress that constitutes a typical year in the world of sustainable business. We took in the enormity of the problems facing humanity and the planet, and scanned the horizon. What we saw were companies continuing to make commitments, form alliances and reach new levels of achievement in sustainability. And the year ahead certainly would bring more of the same. Or so we predicted.

And then 2020 happened.

Suffice to say, it was a year like no other: Crisis after grim crisis, as the ravages of a changing climate revealed themselves in ways large and small, a pandemic devastated families and nations alike, racial justice protests roiled communities, the global economy convulsed and political leaders the world over scrambled to respond — some more successfully than others.

Such turmoil easily could have spelled the end, or at least the pause, of anything having to do with business and sustainability.

But it didn't. The forward march of progress not only continued but accelerated.

What happened? Two words: business fundamentals.

At last, sustainability has emerged from the shadows to be considered part and parcel of corporate success. Indeed, for many of the world's largest companies, sustainability is now seen as key to minimizing risk, increasing resilience, enhancing competitiveness

and unlocking new opportunities. The management of environmental and social risks — as viewed through the lens of ESG metrics — “will likely emerge as the new standard of comprehensive corporate governance and underscore how non-financial E, S and G factors may affect long-term valuation,” Brie P. Williams, a vice president at State Street Global Advisors, said last fall.

Put another way, a company’s sustainability profile increasingly may be baked into its stock price and creditworthiness, possibly affecting the cost of capital it may need for growth. That’s a game changer.

So, where are we?

## **Ambition uptick**

Despite the disheartening headlines, action on ESG concerns has continued relatively unabated in corporate C-suites and boardrooms. To our immense satisfaction, we saw little carnage within corporate sustainability departments during 2020 relative to previous economic downturns, when such functions were often among the first to be downsized or jettisoned.

“Sustainability leaders are in a unique position, with their experience in navigating across their organization’s functions, to help align CEOs and their employees toward common environmental and social causes,” wrote GreenBiz Vice President and Senior Analyst John Davies in “State of the Profession 2020,” the latest edition of GreenBiz’s

biennial report on the role of sustainability professionals inside companies. The report found that “in large companies, there has been a significant increase in terms of the sustainability leader reporting to the CEO, from 19 percent in 2018 to 26 percent today.”

Given this, it was not surprising to see an uptick in corporate ambition on sustainability issues. “Net-zero” became a key commitment during 2020 — goals that aim to eliminate, at least on paper, a company’s greenhouse gas emissions, water extractions, fossil-fuel use or deforestation activities by a given date. And while those target dates are typically decades hence, they set the stage for activists, investors and other self-appointed watchdogs to monitor corporate progress toward their stated goals.

Perhaps more surprising is the rise of “restorative” and “regenerative” among large companies in describing their ambitions to address human and planetary woes. The idea is simple but profound: a switch in thinking from “doing less harm” to “doing more good.” In other words, the leading edge of sustainable business is shifting from companies having inadvertently negative impacts to having deliberately positive ones. And while most such corporate statements are still more aspirational than actionable, they signal a critical shift in thinking about the role companies can play in the years to come.

It’s a lot to take in, especially for the many critics of sustainable business activities, who are prone to see virtually any corporate action as too little,

too late. And they might be right: Most corporate commitments and achievements are insufficient to meet the moment, let alone the future. Incremental change won't cut it at a time when so many planetary boundaries are being crossed and so many social and environmental indicators are spiraling out of control.

### **Peeking around corners**

What will it take for companies to dramatically step up their ambition and actions? That is a defining question of the decade. No doubt the answer lies in a combination of investor pressure, technological innovation, consumption shifts, governmental pressure, new circular business models that reward resource efficiency — and more than a little grit and determination.

It's a tall order, to be sure, but the future demands nothing less.

As we dare to look ahead, however tentatively, at 2021 and beyond, we see more of the same. The seeming mundanity of that sentence belies its significance: Corporate sustainability efforts are continuing apace, even amid economic uncertainty and a global pandemic that, as of this writing, is far from contained. It wasn't very many years ago that the future of corporate sustainability was uncertain even during good times.

What's also different about this moment is the alignment and, increasingly, integration of social and environmental issues inside companies. While it has long been known that the poorest among us endure the brunt of air and water pollution, climate

change and other problems, companies largely have focused on social and environmental issues separately and, all too often, unequally.

That's changing. The rise of social justice movements around the world is shining a harsh light on the linkages between environmental sustainability and social cohesion, not to mention economic vitality, and ESG-savvy investors are beginning to reward companies that better align corporate strategy with the interests of both people and the planet.

As the global economy finds its footing in the coming months, and as a new, more environmentally friendly administration takes hold in Washington, D.C., we expect to see the continued rise of concern

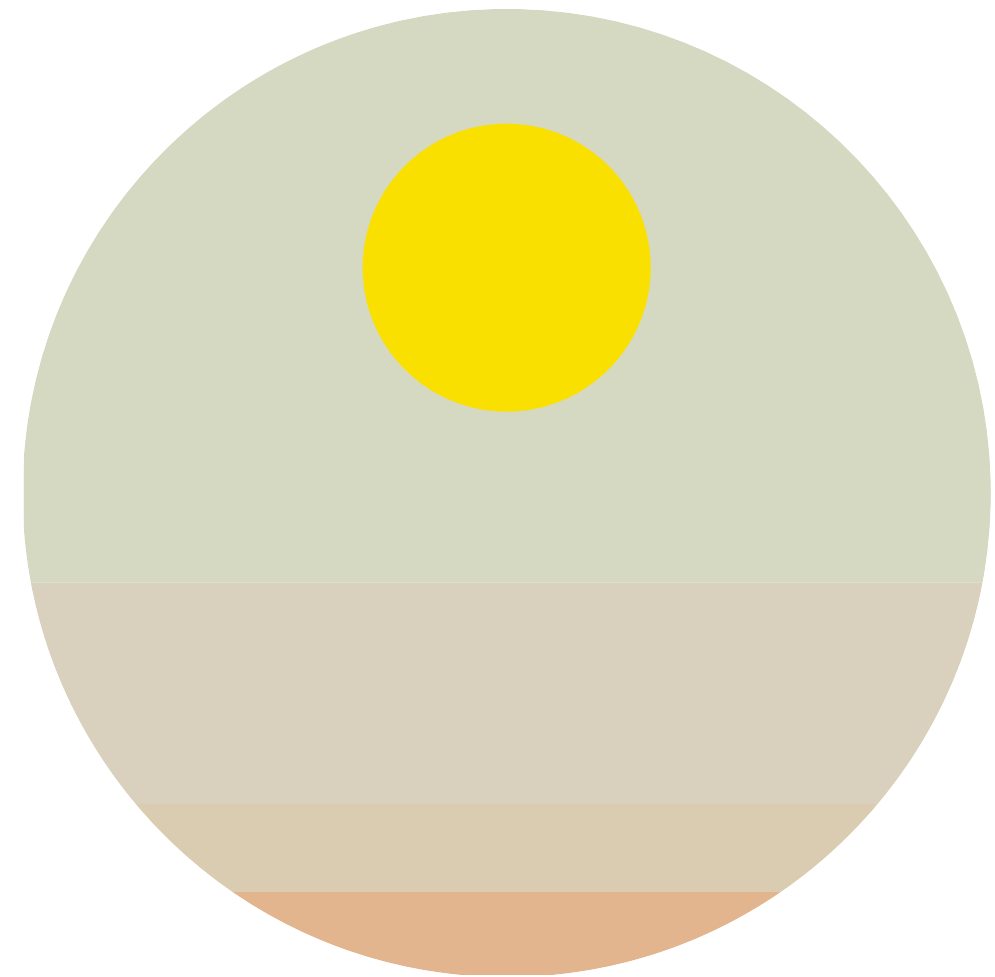
and action on climate, biodiversity, air and water pollution and other pressing issues alongside deeper, more strategic investments in clean energy, green infrastructure, sustainable food systems and other elements of an emerging clean economy.

Indeed, the world's biggest environmental challenges are being seen as inextricably linked to community resilience, economic prosperity, public health and national security. As such, they are rising to the top of the agenda for more and more companies and countries.

These are among the glimmers of hope we see during these turbulent times.

What else can we expect in the coming months? For the 14th consecutive year, we've peeked around corners to identify 10 trends we'll be watching in the year ahead. Here they are, in no particular order.

*Joel Makower is Chairman and Executive Editor at GreenBiz Group*



## Ocean-Based Sequestration Heats Up

By Jim Giles

Over the past few years, as companies have come under steadily increasing pressure to tackle climate change, nature-based solutions have emerged as a particularly exciting method for shrinking corporate carbon footprints. Investing in forests can be a win-win that both sequesters carbon and regenerates nature. That's why [one recent survey](#) recorded almost \$160 million spent on forest offsets in 2019. And a newer option, soil carbon, also [is generating investment from multiple corporate sectors](#).

Yet another natural sink absorbs about as much carbon dioxide as our planet's soils and forests combined: the



least 1,000 years of sequestration. More likely, it will turn into oil or sediment and be sequestered on the geologic timescale — millions of years.”

At Running Tide, engineers will use the Shopify investment to build kelp-growing platforms, which they will launch into ocean current systems selected as having the right temperature and nutrients to support kelp growth. The platforms will be kept afloat by buoys designed to biodegrade once they reach the deep ocean, at which point the kelp will fall to the ocean floor, taking its carbon with it. Running Tide will measure the carbon sequestered in the process and sell credits on the carbon markets.

Shopify also made a bet on [Planetary Hydrogen](#), a startup that aims to produce “green hydrogen” while simultaneously capturing carbon and healing the

ocean. The process begins with a twist on existing green hydrogen technology, in which renewable energy is used to power the production of hydrogen from water, a reaction that produces no carbon. The Planetary Hydrogen team adds a mineral salt to the process, leading to the creation of a waste product — a mineral hydroxide — that binds with atmospheric carbon dioxide. The final step involves adding the bicarbonate compound that results from this reaction to the ocean, where, because the substance is alkaline, it helps counter climate-caused ocean acidification.

According to the company’s calculations, the process can capture and store 40 kilograms of carbon dioxide for every kilogram of hydrogen produced. “Our fuel may be the greenest on



The biology and chemistry of the deep oceans suggest that kelp and bicarbonate could offer a better guarantee of long-term storage than, say, forests. But collecting the data needed to demonstrate that will be challenging given the vastness of the oceans and the fact that this is a new frontier for certification bodies. “We need to rethink the basis for calculating the carbon benefits of these projects,” Carlos Duarte, an expert in marine ecosystems at the King Abdullah University of Science and Technology in Saudi Arabia, said at VERGE Carbon.

Given the uncertainties, many companies will wait before investing in the emerging ocean projects. But there are more established blue carbon options that are better understood. In 2018, for instance, Apple announced that it would back a project to [protect and](#)

[restore 27,000 acres of mangrove forest on Colombia’s Caribbean coast](#). According to Conservation International, one of the NGOs behind the project, mangroves and other coastal wetlands can store up to 10 times more carbon per unit area than terrestrial forests. Apple will purchase carbon credits generated by the project, generating a new income stream for the 12,000 local people whose livelihoods depend on the mangroves.

### **Key Players to Watch**

[Conservation International](#) — the NGO’s work with Apple in Colombia is a leading example of how ocean projects can draw down and benefit local communities.

[Running Tide](#) — this Maine-based company is using Shopify’s investment to pilot an innovative carbon sequestration scheme based on farming and sinking kelp.



## The 'S' in ESG Gains Currency

By Manjit Jus

We have seen a rising emphasis on ESG issues in recent years, as customers, investors and other stakeholders look for more transparency on corporate strategies and their impact on society. Companies are making progress in disclosing their environmental impact and governance standards, but social factors have not been given the same attention — until now.

Social factors include how a company manages relationships with its workforce, the communities in which it operates and the geopolitical environment. The COVID-19 pandemic has pushed “S” into the spotlight

by highlighting a range of problematic societal issues as millions of people around the world found themselves suddenly out of work with little protection.

There are a lot of nuances with data on social issues, such as gender equality, human rights and labor standards. [According to](#) the United Nations Principles for Responsible Investment, “The social element of ESG issues can be the most difficult for investors to assess. Unlike environmental and governance issues, which are more easily defined, have an established track record of market data, and are often accompanied by robust regulation, social issues are less tangible, with less mature data to show how they can impact a company’s performance.”

Social sustainability factors are material issues for many industries, however, and their management is directly linked to a company’s reputation and brand equity. Companies are showing a growing awareness that good social performance can translate into improved business performance and better relationships with customers and local communities. The S in ESG is definitely gaining currency.

Two important areas are gender equality and human rights.

Gender diversity enhances corporate governance, talent attraction and human capital development – [all important factors driving long-term competitiveness](#). Corporate policies promoting gender diversity are a reflection of a well-



systems. This includes flexible work arrangements and parental leave policies that go beyond legal minimum requirements. Companies are asked a number of questions about their gender equality policies and practices in the annual survey. Findings suggest that companies with a more diverse and equal workforce are indeed better positioned to outperform.

Additional [research](#) by S&P Global Market Intelligence pointed to evidence of the outperformance of female executives relative to their male peers. Results showed that female CEOs drove more value appreciation (defined as a decrease in the book-to-market multiple relative to the sector average) and improved stock price momentum for their firms. In addition, female CFOs drove more value appreciation, defended profitability moats better and delivered

excess risk-adjusted returns for their firms.

Clearly, an increased focus on both diversity and equality will be needed going forward.

The social factor in ESG is also heavily populated with human rights-related elements. Drivers include internationally recognized standards, such as the U.N.'s Guiding Principles on Business and Human Rights (UNGPs), as well as the growing interest of asset owners and managers in the U.N.'s Sustainable Development Goals. As part of their responsibility to implement the UNGPs, companies must have systems and practices in place enabling them to know and show that they respect human rights.

Crucially, this includes an ongoing risk-management process to identify, prevent, mitigate and account







to deliver value to customers, invest in employees, deal ethically with suppliers, and support the communities where they work.”

When it comes to investing in employees, Tyson Foods faces the challenge of its plants being predominantly in rural areas with limited labor pools, and with many of its front-line team members recent immigrants. To address this labor shortage, the company launched the [Upward Academy](#), offering free and accessible classes in English as a Second Language, High School Equivalency, U.S. citizenship, financial literacy and digital literacy. The program is still in its early stages but all signs point to the investment paying off in terms of employee engagement and retention, and leading to a stronger local community.

Purchasing and sourcing strategies are also getting realigned to support local communities as well as smallholder farmers around the globe. Supply experts at Sodexo, a French foodservice and facilities management company, have worked with the Sustainable Purchasing Leadership Council to target local and seasonal produce, working with local farmers and producers around each of its client sites. This approach evaluates environmental, social and economic impacts on the community and helps local businesses to thrive, which in turn benefits the company’s clients.

Corporate sourcing decisions can drive change for communities around the world. Companies such as Mars and Griffith Foods have established sustainable sourcing programs that seek to create



volunteering, providing employees paid time to support educational initiatives in entrepreneurship and financial literacy, leveraging their consulting skills to better the community.

AT&T has reinvented its philanthropic approach so that it looks more like its store franchise model. [AT&T Believes](#) is a localized effort to create positive change in the communities where it operates, letting local employees determine how to best have an impact. Wells Fargo has launched pitch competitions to [fund breakthrough ideas](#) that promise new ways to create urgently needed affordable housing nationwide.

Such initiatives are part and parcel of recent efforts to measure the social contribution of business. There are currently few standards to guide and measure community investment and other social impacts. Danone, Patagonia and others have been certified as

[B Corporations](#), identifying them as businesses that meet the highest standards of verified social and environmental performance, public transparency and legal accountability to balance profit and purpose. B Lab, the organization behind the voluntary standard, offers an assessment tool that can start companies on their journey toward strategic community investment.

### **Key Players to Watch**

[Sustainable Purchasing Leadership Council](#) — convenes buyers, suppliers and public interest advocates to develop programs that simplify and standardize sustainable purchasing efforts by large organizations.

[1% for the Planet](#) — businesses can support environmental nonprofits by donating the equivalent of 1 percent of sales through a combination of monetary, in-kind and approved promotional expenses.

[Uprose](#) — Brooklyn’s oldest Latino community-based organization. Central to its work is advocacy to ensure meaningful community engagement, participatory community planning practices, and sustainable development with justice and governmental accountability.

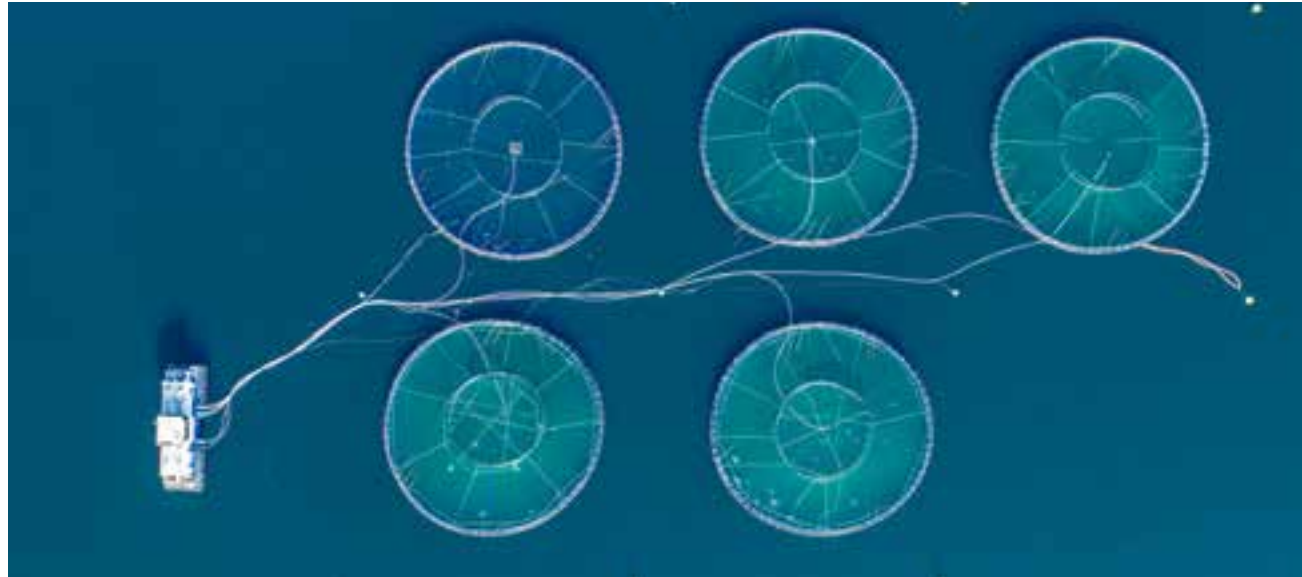
[Rainforest Alliance](#) — its Forest Allies program aims to create a community of practice beyond individual supply chains to engage and empower local communities in critical forest landscapes.

[Believe Chicago](#) — this AT&T program started in Chicago, where employees identified a major problem, gun violence. It has since contributed over \$2 million to various Chicago-based charities aimed at reducing gun violence and unemployment.

*John Davies is Vice President and Senior Analyst at GreenBiz Group*







Now, a wave of technology innovation and [funding](#) from an eclectic group of companies ranging from Google's parent Alphabet, to the [Seed2Growth fund](#) linked to Lukas Walton (grandson of Walmart founder Sam Walton), to [Cargill](#) and [Chevron Ventures](#) (both focused on fish-feed ventures) is changing the tide again.

In 2018, the last year for which figures were available, worldwide aquaculture production reached an all-

time high of 114.5 million metric tons in "live weight," representing a market value of almost \$264 billion, according to a [2020 report](#) by U.N. Food and Agriculture Organization (FAO). That amount accounted for 52 percent of global fish consumption. The annual growth rate will slow over the next decade, but FAO projects aquaculture will supply close to 60 percent of fish consumed globally by 2030.

Many factors contribute to this renewed surge in interest in farming fish and sea vegetables. Chief among them are worries over the long-term viability of global fisheries and concern over the fragility of food supply chains, which were sorely tested by [disruptions](#) related to the COVID-19 pandemic. The United States, for example, imports a vast majority of the salmon it eats, with long-term consequences for transportation-

related emissions. The most dominant region in the world today for aquaculture production is Asia, particularly China, but Norway (for salmon) and Central America (for tilapia) are also big exporters.

“Expanding access to blue food — that is, sustainably grown marine and freshwater organisms including fish, shellfish and sea vegetables — can play an important role in reducing the carbon emissions associated with the food we eat ... While sustainable aquaculture alone won’t solve the problem of reducing carbon emissions, seafood is one of the lowest carbon sources of protein available — so it’s a great place to make an impact on the climate crisis in the next five to 10 years,” said Neil Davé, general manager of [Tidal](#), an Alphabet X moonshot project.

The Tidal research team is testing artificial intelligence and imaging technology as a means to monitor fish health, spot pests and reduce waste at fish farms run by Norwegian seafood company [Mowi](#), the world’s largest Atlantic salmon producer and ranked ([again](#)) in November as the world’s most sustainable protein producer by the FAIRR Initiative, which produces research for institutional investors interested in environment, social and governance issues.

Digital innovations such as Tidal’s that provide better insights into fish farming operations — alongside new recirculating aquaculture system designs and purification advances, such as the “nanobubbles” generators designed by startup [Moleaer](#) — are contributing to rising levels of speculative activity. Over the past four years, for example, more than



[aspirations in Arizona](#)), [Innovasea Systems](#) (based in Boston) and Pure Salmon (which is building an operation in Virginia).

[Atlantic Sapphire](#), which is raising Bluehouse salmon on land in southern Florida and has invested upwards of \$100 million in the facilities to do so, in November began selling its first fish raised without hormones, antibiotics or pesticides to supermarkets including the Publix super market chain. While its initial capacity is limited to about 10,000 metric tons of fish, the company aspires to supply 12 percent of the market by 2026. Its ultimate goal: 220 metric tons annually by 2030 — that's nearly 1 billion salmon meals.

“By producing an increasing amount of seafood sustainably as farmers, the industry can help

relieve pressure on wild stocks that might currently be overfished commercially. Raising salmon on land helps to avoid the effect on coastal areas, ensuring the well-being of our planet,” observed Damien Claire, chief sales and marketing officer at Atlantic Sapphire.

Publix Super Markets is already making a big bet on [aquaculture](#), not just with salmon but with species such as cobia, shrimp, pompano and tripletail. “You have to be engaged in aquaculture, you have to be successful in aquaculture, to be successful in seafood,” noted Guy Pizzuti, business development director for seafood at Publix.

Of course, there are other creatures in the sea aside from finfish. One notable difference between the aquaculture industry emerging this decade and the focus of the past is that it's not all about cultivating





Still, as more food companies, investors and entrepreneurs cast their ideas into the ocean of aquaculture innovation, the greater the chances for a bountiful, sustainable catch.

### **Key Players to Watch**

[Akua](#) — makes jerky and pasta from a variety of kelp called Saccharina Latissima.

[Atlantic Sapphire](#) — a Norwegian-born company that opened its first U.S. Bluehouse salmon production facility in Florida in summer 2020.

[GreenWave](#) — is promoting the idea of “regenerative ocean farms” that combine cultivation of kelp with oyster beds.

[Loliware](#) — makes plastic-alternative straws from seaweed that will be used by the likes of Marriott and Sweetgreen.

[Tidal](#) — uses AI and imaging technology to monitor fish health, spot pests and reduce waste.

*Heather Clancy is Editorial Director at GreenBiz Group*



The emissions associated with manufacturing and other heavy industries could broadly be divided into [three categories](#): indirect energy (from purchased electricity and heat, responsible for about 44 percent of emissions); industrial processes (such as the use of chemicals that release greenhouse gases, 19 percent); and onsite combustion (37 percent, usually for heat processing).

All three are in urgent need of innovations and deployments, but the last of those three — combustion — has, until now, received the least attention.

Climate-conscious companies that depend on thermal processing — used to produce everything from food to ferrous metals — seek better solutions. Historically, these have been inadequate or unaffordable, but a new generation of technologies is promising to change that.

For example, in 2019 [L'Oréal USA](#) announced that [14 of its factories](#) were “carbon neutral,” and the beauty giant continues to look for renewable options for all of its thermal loads as part of its science-based targets. [U.S. Steel Corporation](#) had a goal to reduce its emission intensity by 20 percent by 2030, based on 2018 baseline levels. While a modest target, the commitment is an acknowledgement that the sector needs to make progress, as steel is one of the most emission-intensive sectors (together with cement and chemicals).

Companies are banding together to reach breakthroughs faster. In 2019, General Motors, Cargill, Mars and L'Oreal USA, formed the [Renewable Thermal Collaborative](#) (RTC), and since have been joined by more than a dozen other large energy users. Modeled







into applications as easily as natural gas. However, because hydrogen molecules are much smaller than methane molecules, today's natural gas infrastructure is too leaky to hold or transport hydrogen. Expect this to be in the R&D phase with limited deployment for onsite applications until [midcentury](#).

- **Biomethane.** Capturing methane emissions from dairies, landfills and wastewater treatment facilities holds great promise. While seductive, the resulting fuel (sometimes called renewable natural gas, or RNG) has a limited supply (it could only cover [3 to 7 percent](#) of natural gas used today) and issues with [land use](#) (large dairies impact surrounding, low-income communities). Meanwhile, [natural gas utilities](#) are overstating its

potential to justify infrastructure investments, which runs the risk of slowing electrification of appliances that already have market-ready electric alternatives.

Additional technologies include solar thermal, geothermal, nuclear, cogeneration and carbon capture and storage. All have economic and technical tradeoffs, and with corporations and policymakers backing the transition, innovators have a lot to gain by cracking the renewable thermal energy code.

Robust policy support will be key to rapidly scaling the transition. Despite corporate commitments to decarbonize, emissions from heavy industry are [on track](#) to rise 0.4 percent annually through 2050 — at a time when they need to be dropping precipitously.

According to [30 leading experts](#) on energy and policy, high-impact policies to decarbonize industry include carbon pricing, government support for R&D, industrial process emissions standards and energy-efficiency support.

The good news is many of these policies align with components of President Joe Biden's [climate plan](#), which include financial support for innovation and deployment, boosting markets through federal purchase requirements, and workforce training and education. The new administration also has placed a specific emphasis on industrial heat needed for steel, concrete and chemicals.

Policy also has an important role in supporting financing on these innovations. Given that new infrastructure development works on roughly 25-year

cycles, policy direction now can help us avoid making climate-busting investments down the highway.

While time will tell if the Biden administration will realize all of its goals, it bodes well that decarbonization is seen as a boon for the economy. [Rewiring America](#) research shows how decarbonizing the economy can create around 25 million jobs in the United States alone. According to separate reports from [Columbia University's Center on Global Energy Policy](#) and [the Industrial Innovation Initiative \(I3\)](#), a coalition of industry, NGO and public sector players dedicated to decarbonizing industry, investment in R&D for clean breakthroughs will stimulate jobs and economic growth. Meanwhile, Bill Gates' Breakthrough Energy commissioned a report that crunched the numbers to show that the spillover economic gains

from such an investment would be significant — all of which bodes well for political action.

## Key Players to Watch

[Apple](#) — the tech giant is striving for carbon neutrality throughout its supply chain by 2030. That means it will need to use its influence as a buyer to shift international markets — something we're already seeing in Taiwan and Denmark.

[Boston Metal](#) — this Massachusetts-based steel producer is using molten oxide electrolysis, removing the need for coal as a feedstock.

[DBL Partners](#) — this venture capital firm sees how companies are looking for electrified solutions for thermal energy, and it is investing in startups to get there. It is an investor in Bellwether Coffee and

partner Nancy Pfund has signaled her continued interest.

[Mars, Inc.](#) — this founding member of the Renewable Thermal Collaborative is working towards all fossil-free energy by 2040 — no easy feat for a company in the low-margin business of pet food and confectionery.

[Renewable Thermal Collaborative](#) — Is pulling together companies to accelerate cost-effective renewable technologies, spearheading buyers principles, working groups and research, all with the goal of scaling solutions faster.

*Sarah Golden is Senior Energy Analyst & VERGE Energy Chair at GreenBiz Group*



stay the same. This will have a tremendous impact on nature that, in turn, will affect businesses and the global economy. As with climate-related risks, nature-related risks need to be better understood and acted upon. The World Economic Forum [analyzed](#) 163 industry sectors and their supply chains and found that over half of the world's GDP is [moderately or highly dependent](#) on nature and its services. Highly dependent industries generate 15 percent of global GDP (\$13 trillion), while moderately dependent ones generate 37 percent (\$31 trillion). Despite this reliance, human behavior continues to push species into extinction, reduce the world's acreage of forests and deplete the water supply.

The Financial Stability Board recognized that climate change presents a financial risk to the global economy. By creating the [Task Force on Climate-](#)



[related Financial Disclosures](#) (TCFD), a framework is in place for organizations to better understand and report on these risks. This increased awareness is helping companies make more informed strategic decisions, while also providing better access to capital by increasing investors' and lenders' confidence that a company's climate-related risks are being appropriately assessed and managed.



a leading sports lifestyle company, believes that businesses should account for and, ultimately, pay for the cost to nature of doing business. It recognizes that these costs could hit the financial bottom line as a result of new government policies, environmental activism, consumer demand or a growing scarcity of raw materials.

Back in 2011, the company worked with Trucost to develop an environmental profit and loss (EP&L) account to help measure and manage environmental impacts across its operations and supply chain. An extension to this analysis helped assess the environmental impacts of a product at each stage of its lifecycle, from the generation of raw materials and production processes all the way to the consumer phase when the owner uses, washes, dries, irons and

ultimately disposes of a product. The work helped Puma realize the value of nature's services, without which it could not sustain its operations.

The Dow Chemical Company is another example of a company that is taking action. Its 2025 sustainability goals include one for valuing nature, which is a commitment to consider nature in all business decisions. The valuing-nature goal builds on work that began in 2011 in partnership with The Nature Conservancy. Scientists, engineers and economists from both organizations have worked together to create tools to assess the various services that nature provides to Dow's operations and the community, including water, land, air, oceans and a variety of plant and animal life.









For most companies, tackling the carbon emissions associated with employee travel is a big part of the decision to offer these perks. For Inkgate Group, 15 percent of the company's greenhouse gas emissions come from transportation, a combination of employee and customer travel as well as goods delivery. IKEA is developing plans to halve its emissions from customer and employee travel, and is piloting a program to better help its 160,000 coworkers carpool together.

But attracting and retaining employees remains a solid byproduct of overarching corporate sustainability goals. "A significant part of our employees are under 25 and we want to attract the best talent on the market. So we need to figure out how to get people to us," said IKEA Head of Sustainability Angela Hultberg at VERGE 20.

Nonprofits such as The Climate Group are increasingly working with these companies to help set goals around EVs. Genentech, Inka Group and Clif Bar are all members of the [EV100](#), a group of companies that have pledged to deploy EV chargers on campuses and, when possible, convert vehicle fleets to electric. So far, [92 companies](#) have joined the EV100, representing major growth from the program's launch three years ago.

Another driving force behind the growth in corporate sustainable mobility programs is evolving consumer and political sentiment. Most Americans now agree that [global warming is happening](#), and the new Biden administration is [touting the most ambitious climate agenda](#) in American history. Transportation emissions are the single largest source of greenhouse gases in the United States, and American cities, and some states





for the foreseeable future, transportation emissions unexpectedly have dropped and public transit in particular has seen a disturbing decline in ridership.

A silver lining of the shift to remote work has been an increasing reliance and interest in telecommuting. Expect some key aspects of this trend to remain in place after employees return to offices, including significantly reduced business air travel and an increase in video conference calls. In 2021, companies will continue to leverage the sustainability and efficiency boosts of working from home, at least much more than pre-COVID.

Some policy makers are even looking to codify such COVID-era sustainable transport trends into new mandates and goals. The San Francisco region's Metropolitan Transportation Commission [recently](#)

[proposed](#) developing sustainable commute targets for companies that have more than 50 employees.

But eventually, as vaccines are widely deployed, employees across the globe will return to workplaces in greater numbers. It's now the role of forward-looking companies — and their transportation leaders — to lean into sustainable mobility offerings for employees to enable their transition back in the greenest way possible.

### **Key Players to Watch**

[Genentech](#) — the biotech giant recently received approval to potentially double its South San Francisco campus and employee headcount. Expect to see Genentech's unique sustainable mobility program kick into overdrive as it designs for major growth.

[Ingka Group](#) — the Swedish parent company of IKEA looks at sustainable mobility holistically across its sweeping empire, from the vehicles that deliver its products, to the employees that commute to its offices, to the customers that mostly drive to its stores.

[Clif Bar](#) — the protein bar maker developed one of the earlier sustainable mobility programs in 2006 with its [Cool Commute](#) initiative. Today, hundreds of its employees take advantage of perks such as cash incentives to buy bikes and EVs in order to eliminate cars in employee commutes.

[The Climate Group's EV 100 Program](#) — launched in 2017, it now has 92 members that make pledges to adopt electric vehicles and deploy EV chargers by 2030.

[Scoop](#) — the carpooling startup launched in 2015 says it works with 15 percent of the Fortune 100, including LinkedIn, Samsung and Rakuten.

*Katie Fehrenbacher is Senior Writer & Analyst, Transportation at GreenBiz Group*















































































































































