



VANTAGE

2021–2031 MAP OF THE DECADE TOWARD CLIMATE-POSITIVE ORGANIZATIONS

INSTITUTE FOR THE FUTURE



About our 2021–2031 Map of the Decade

Every year, IFTF Vantage produces a Map of the Decade to examine emerging challenges and opportunities that organizations need to understand to help them plan for long-term success.

Our 2021-2031 Map of the Decade is called *Building Climate-Positive Organizations*. The Map, in a series of five deep-dive forecasts, is designed to help your organization identify opportunities for transformation that you can act on today to become climate-positive.

Building Climate- Positive Organizations

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Building Climate- Positive Organizations

What's a climate-positive organization? It's one that works aggressively to cut carbon emissions to zero quickly as possible. But a climate-positive organization doesn't stop there. It also improves the health and resiliency of the environmental systems that all life on Earth depends on by removing more carbon than it produces.

The climate crisis will be perhaps the most important force of the next several decades—and the decisions we make in the 2020s will be critical to our ability to shape our long-term future. The climate crisis demands that we act with urgency in a time of unprecedented challenge and complexity, and it means we have to think in a longer-term timeframe than we usually do.

IFTF Vantage Map of the Decade

The Map is designed to help you think systematically through the climate crisis and where it fits into your organization's strategic planning. It's also designed to help you think through what you need to do to build a climate-positive organization for the long-term.

The content consists of the following deliverables and experiences for IFTF Vantage partners, available on Vantage Point:

- **An introductory presentation** of this year's research and the five principles of climate-positive organizations
- **A deep-dive presentation** documenting four opportunities for transformation across technology, economics, social, and governance
- **A replicable toolkit** and facilitation process for identifying your organization's future vision for becoming climate-positive, which includes six future visions of how climate-positive organizations will position and differentiate themselves in the coming decade.

The Four Deep-Dive Forecasts

This report presents **four deep-dive forecasts** exploring opportunities for organizations to become climate-positive. The topics are **technology**, **economy**, **governance**, and **social impacts** of climate change.

Each deep dive starts with an analysis of the current and emerging state of issues, highlighting factors adjacent to the climate crisis. It's followed by a set of 4 forecasts, supported by signals of change.

It concludes with insights to help your organization transition to the low-carbon, climate-positive world of the future.

The challenges of the climate crisis are daunting, but well-prepared organizations will find that climate change offers opportunities to become more sustainable, resilient, and profitable than ever before.

technology

Technologies of transformation:
from footprints to handprints

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INSTITUTE FOR THE FUTURE

Accelerating the technological transition

A triad of technologies plays a crucial role in pushing back against climate disaster and accelerating the transition to climate-positive organizations: ubiquitous electrification; reduced energy consumption; and removal of carbon dioxide, methane, and other greenhouse gases from the environment. An organization may have limited control over these elements, but it should be aware of how current strategic plans would fare in a world pushing hard on these levers.

Many organizations have grappled with large-scale technological transformations in the past, and they will recognize the scope of the necessary changes. Issues arising with past transitions, such as infrastructure management, device support, and system compatibility, will undoubtedly be evident with this process. The timeline requirements add to the layers of complexity—this all must be done far more swiftly than preferred. None of this will be easily implemented.

Accelerating the technological transition (cont.)

There are myriad subtle complexities in how these technologies are to be developed and deployed. Organizations will face technical decisions in this decade with long-term implications. Technological evolution will offer new pathways, but rising system pressures and stakeholder demands may force organizations to make choices before they are ready. And many of the large-scale pressures driving these changes may overlap. Figuring out the economies of scope that allow for “multi-solving” different problems will be a key skill in the decade to come.



The push for ubiquitous electrification

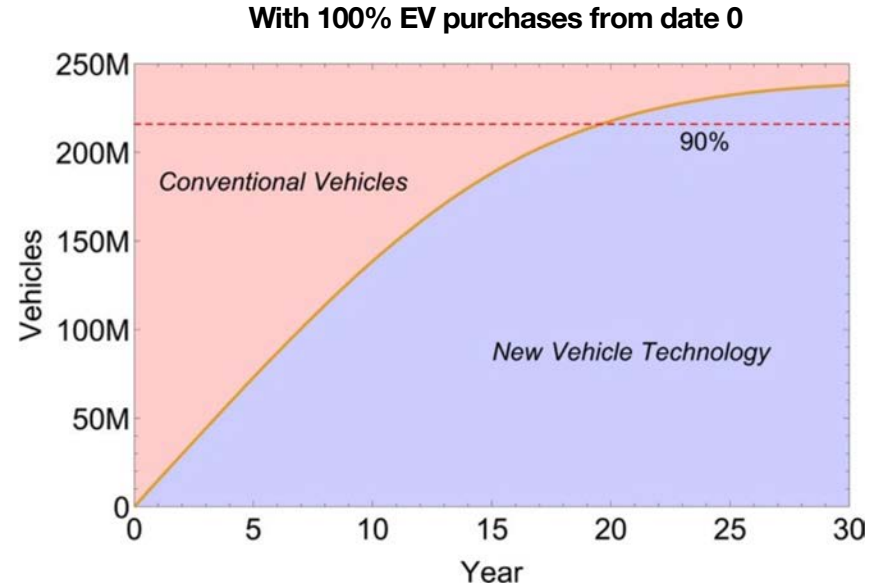
Over the decade, electricity will increasingly replace other forms of energy, and much of that electricity will be clean. Non-carbon power sources (primarily renewables) will become a much greater part of the global energy mix, potentially even overtaking coal and natural gas for electricity generation. Both market and regulatory forces are at play here, and a growing number of companies recognize the need for change.

Most visible to the public will be the transition to electric vehicles, but that's just the start. Across the United States, state environmental agencies are pushing for elimination of natural gas-fired appliances, especially gas stoves and furnaces. A growing number of cities are forbidding the installation of natural gas lines into new homes. This is not solely due to the carbon emissions; airborne particulates produced by natural gas can pose a significant health hazard.

Stranded assets challenge push to electrify

The big stumbling block in a rapid transition to ubiquitous electrification comes from the costs of abandoning otherwise functional assets that rely on fossil energy. This will be an issue for consumers as well as corporations. A 2019 MIT study demonstrated that even if **every** new car or light truck purchased in the United States is electric, it will still take nearly 20 years to reach 90% electric vehicles on the road.

The turnover is even slower and the costs are far higher for energy infrastructure. For example, in 2020, Shell and BP wrote off nearly \$40 billion in stranded oil and gas rights.



Efficiency and wise consumption

Simply moving away from carbon-heavy energy isn't enough. Doing more (energy efficiency) with less (reduced energy consumption) is a critical part of both enabling a smooth transition to renewable/zero-carbon energy and minimizing the environmental harm arising from the remaining carbon energy in the system.

Reducing the power demand footprint depends both on smart design and wise use. Products, buildings, and business processes can benefit from designs meant to reduce energy consumption without reducing value. Practices like remote work and telepresence exemplify process changes that improve efficiency and reduce energy consumption.



Shifts toward efficiency complicated by current tax structures

Adopting higher-efficiency and lower-consumption technologies can weaken long-established systems, particularly those where conventional energy use is tied directly to organizational income. Roads are maintained largely through gasoline taxes, for example, and the switch to hybrids and especially electric vehicles puts governments in the position of finding new mechanisms to pay for highway management.

Similarly, power companies (whether private or state-owned corporations) that receive income directly proportional to energy use have no incentive to support the deployment of efficient technologies, and in some cases, may even lobby against them.





The emergence of carbon drawdown technologies

The third leg of the triad is carbon drawdown, actively removing existing carbon emissions from the ocean-atmosphere system. Of the three, it is the least-developed, but it also has the greatest transformative potential. De-carbonized electricity and improved efficiency are critical “stop digging” steps; carbon drawdown offers a chance to start climbing out of the hole.

At present, carbon drawdown will not be a part of most organizational practices. Agriculture is an exception here, and techniques such as biochar (shown), sequestering carbon in soil, and increasing carbon consumption in plants will be critical. This may change as technologies develop: paint that traps CO₂ and the use of carbon-sequestering materials in production may become key elements of footing for climate-positive organizations.

Potential moral hazards of drawdown technologies

Most researchers looking into technological mechanisms for capturing atmospheric carbon express a great deal of concern about the possible “moral hazard” connected with doing so. In short, they worry that a clear ability to draw carbon and methane from the atmosphere will reduce the willingness of people to intentionally reduce carbon emissions, especially if those active efforts have associated costs.

This is especially worrisome as the potential impact of carbon removal technology over the decade will very likely remain a minuscule fraction of what’s needed to reduce atmospheric greenhouse gases significantly. The perception of imminent success may make that very success impossible.





Political and economic pressures accelerate tech adoption

At once both carrot and stick, government policies may force the hands of many organizations. These will come at all levels of governance, from local communities to transnational compacts like the European Union. This driver is very likely to increase, even accelerate, over the next decade.

But it's not just the state. Investors, insurance, and customers are also pressuring organizations to act against climate dangers. Market forces have rapidly become critical drivers of zero-carbon technology adoption. This is especially true when organizations are thought of as the consumers in this calculus, such as with delivery companies adopting electric vehicles and the growth of very low-cost renewable electricity.

Political fallout threatens to inhibit adoption of renewable energy

With system-level transformation, it's easy to think in terms of abstract forces and faceless industries. It's important to remember that significant technology and infrastructure changes carry severe disruptions to economic strength and political power. Loss of jobs and regional tax bases are not easily solved problems, especially when skills and assets are not transferable. Regions that have tied their economies to carbon resources could be economically devastated by such disruptions.

It's unlikely that most communities and states facing a major loss of economic capacity will accept that gracefully. But again, this isn't about abstractions. These will be stakeholders—employees, customers, and communities—who may feel directly harmed by changes outside of their control.





Desperate experimentation

One driver of the coming decade will be the increased variety of experimental approaches and radical ideas being tried to accelerate our response to the climate disaster. Once-fringe concepts like solar geoengineering and large-scale bioengineering are already moving into mainstream discussion. New technologies will be embraced or discarded based on how readily they improve our carbon situation. We will face the dilemma of adopting systems that show promise, even if long-term questions about reliability or risk have yet to be answered.

This will happen across the scale of technologies. Individual companies or groups may wrestle with adoption of cutting-edge devices. At the same time, entire societies and governments will face the dilemma of deploying technologies like geoengineering that could be lifesavers—or planet-wide disasters.

Unexpected consequences

The combination of the need for massive change and the very small window of time to implement that change will inevitably lead to unwanted or unexpected repercussions. In the worst case, the resulting consequences could be large enough to refocus attention away from climate.

Not every possible consequence of pushing technological development is (literally or figuratively) Earth-shattering, however. One common challenge with experimentation is the drive for standardization. The need to settle on standard formats and interfaces for new technologies typically runs headlong into the desire to improve a design still in flux. Although this is usually left to the market, at least at first, government regulators can step in and demand a particular format become the standard that everyone must use.



Four Forecasts

1

The Great Rewiring

Zero-carbon means more than just swapping out power plants

2

Reinventing Materials

Taking a new look at what goes into the things we make

3

Embracing Biotechnology

New tools to alter farming and remake ecosystems

4

Environment of Things

Networking built around living things for constant measurement and adaptation

1

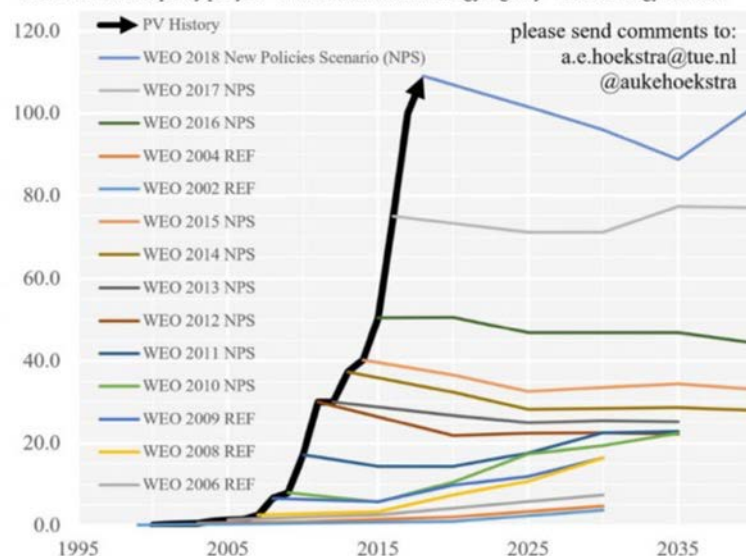
The Great Rewiring

Accelerating the growth of renewable energy

The growth of zero-carbon energy production is happening much faster than conventional forecasts have suggested. Groups like the International Energy Agency regularly produce forecast charts on energy prices and energy resource mix. For over a decade, these charts have significantly underestimated the pace of renewable energy growth. The IEA now estimates that wind and solar renewables will be the leading source of electricity worldwide before 2025.

The most basic—and easily one of the most important—consequences of this for organizations is the functional elimination of carbon emissions. In regions where customers can choose energy providers, businesses are increasingly able to reduce their carbon footprints dramatically by simply switching to all-renewable or mostly renewable power. As the cost of solar and wind continues to drop, this switch can provide an economic benefit as well.

Annual PV additions: historic data vs IEA WEO predictions
In GW of added capacity per year - source International Energy Agency - World Energy Outlook



1

The Great Rewiring

Accelerating the growth of renewable energy (cont.)

Photovoltaic solar power is already, on average, the least expensive source of electricity, with wind power close behind.

Solar photovoltaics do not need to be used in centralized locations, opening new opportunities for climate-positive organizations. Solar can be deployed on rooftops and other open spaces, allowing businesses to provide some or all of their own electricity. As the use of electric vehicles increases, this may become a necessary step for holding down costs, and free car charging at work may become a potentially welcome benefit.

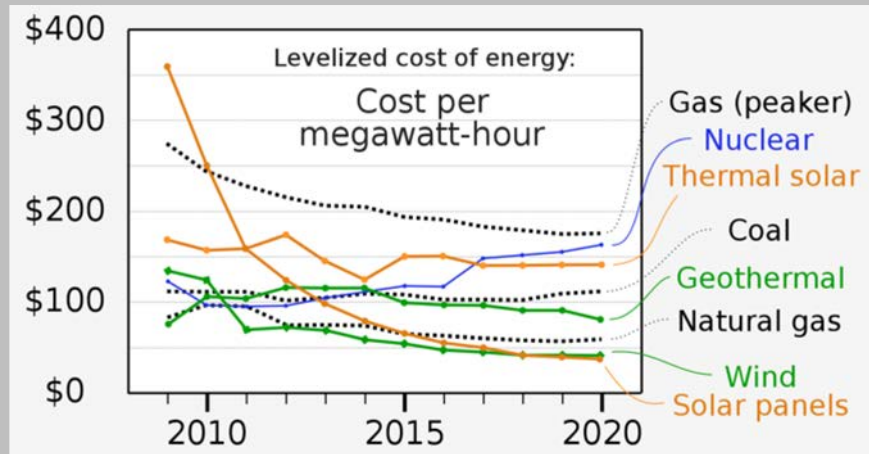
But electricity is currently only about a quarter of global “primary” energy production. Becoming climate positive will require a much faster shift away from fossil fuels and, in many cases, will raise strategic questions about whether to build renewable infrastructure or buy energy from central producers.



Signal: Plummeting price of renewables

WHAT: Renewable energy—in particular, wind and solar photovoltaic—has significantly dropped in price over the past decade. As of 2020, solar PV is on average the least-expensive form of electricity production per megawatt-hour, with wind very closely following.

SO WHAT: Advances in photovoltaic chemistry and wind turbine engineering promise to continue this price reduction trend. The financial benefits of moving to renewable power are likely to grow, especially when carbon-based energy becomes subject to added taxes and regulations. Cost alone has become a major driver of ubiquitous electrification.



Signal:

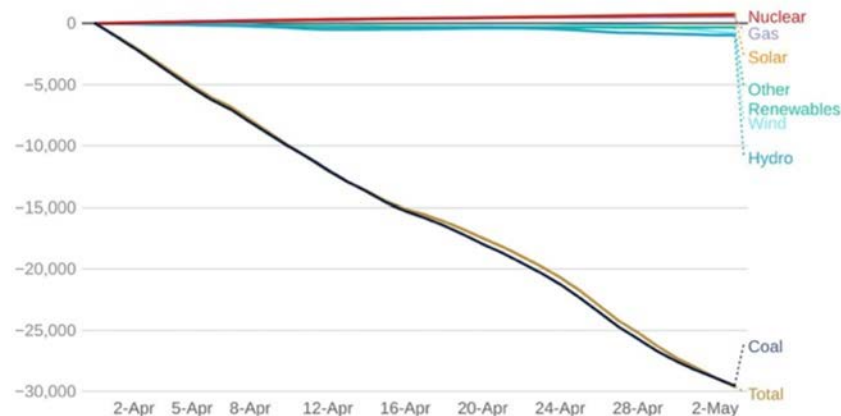
Global shift to renewables has the potential to lower exported emissions

WHAT: Cheaper renewables are shifting global energy use patterns. In 2020, both China and India saw a major push towards greater renewable energy use. New “must use” rules in India mandate that renewable energy must remain online during reduced grid output. China built 72GW of wind power in 2020, more than the rest of the world combined.

SO WHAT: Beyond the obvious overall benefit of reducing carbon emissions, this development means a reduction of “exported emissions,” where U.S.-based businesses claim lower domestic emissions by relying upon subcontractors in places like China. Nonetheless, China remains the top carbon-emitting country, and India is rising quickly.

Figure 3: India's Electricity Generation by Fuel Type (April 2020)

Data are cumulative generation value differences, by source, FY21-FY20, for April 1 to May 3. Units are GWh.



Source: POSOCO Daily Reports, Charles Worringham for indiapowerreview.com

Signal:

Solar mandates for new buildings distribute renewable production into communities

WHAT: City and state-level governments across the United States (and soon in Europe) mandate solar panels on all new (and usually renovated) residential buildings. California, which was the first to mandate residential solar, seeks to expand that mandate to include commercial buildings by 2023.

SO WHAT: Mandates such as these have multiple indirect consequences for organizations. Even when limited to residences, material and installation costs drop as both supply and demand increase. When expanded to commercial buildings, one key result is a leveling of the playing field on distributed renewable energy, reducing the short-term costs that might arise from being an early adopter of local zero-carbon energy.



Signal:

Tidal power and other novel renewable energy sources

WHAT: Although solar PV and wind remain at the top of the renewable energy list, investments in other forms of zero-carbon energy are beginning to pay off. Geothermal and hydrokinetic (tide and wave) electricity generation have several advantages over solar and wind. Most notably, they are non-intermittent—output from these sources is essentially steady throughout the day.

SO WHAT: Hydrokinetic energy, like wind, needs ample space to operate, but operates primarily out of sight, making it potentially more attractive to coastal residents. Geothermal, like solar, can be built out both as centralized energy and as building-based heat and power. Organizations desirous of expanding their zero-carbon energy base should look beyond the big two.



Scottish company MeyGen operates the world's largest tidal array, providing energy for 2,200 homes.

Signal:

Agrivoltaic farms point toward opportunities to multi-solve with renewables

WHAT: Done correctly, the shade from solar panels installed in crop fields cools growing plants such that they require much less water—and the evaporation from the plants cool the solar panels, making them up to 10% more productive.

SO WHAT: Use of agrivoltaic farming remains in its infancy, but projects such as Oregon State University's model sustainable farm demonstrate its effectiveness. Adding solar panels to farmland improves the productivity of both the farmland and the solar panels. From a larger perspective, agrivoltaic farming illustrates the value of multi-solving and polymorphic thinking as mechanisms for adding value to an organization.



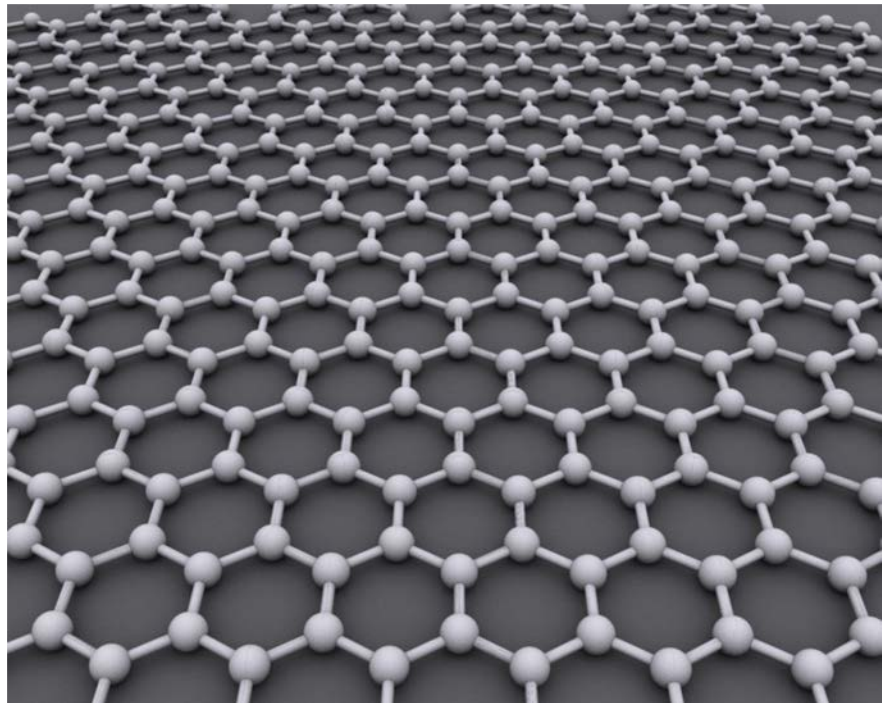
Reinventing Materials Science

Using the physical environment to reduce and remove carbon

Globally, manufacturing produces around 12% of all human-caused greenhouse gas emissions; in the United States, it's closer to 22%. About a quarter to a third of these emissions comes from industrial uses of grid electricity. Most emissions are created by the direct consumption of fossil fuels in production and by certain chemical reactions during the manufacturing process, such as with steel and concrete.

Beyond the carbon aspect, the production of plastics is also a primary contributor to pollution of the global biosphere.

But rethinking materials means more than inventing new production techniques. It also demands that we consider new ways to use our physical environment itself as a tool to reduce our carbon emissions.



Signal:

Transparent photovoltaics

WHAT: Solar photovoltaic materials can be made to be serviceably transparent, therefore usable as windows. Although the resulting panels are small compared to a conventional PV panel, and the placement angle may not be optimal, such windows can provide a useful amount of additional zero-carbon electricity. Roughly 40% of energy generated globally is consumed within buildings.

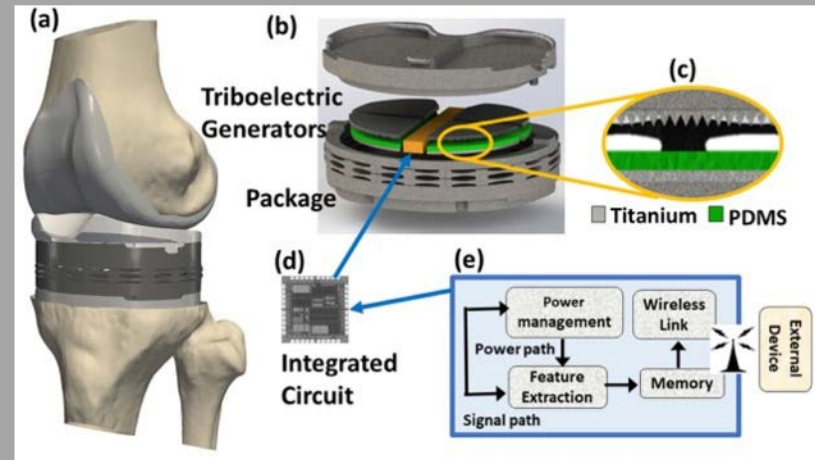
SO WHAT: Beyond the evident utility of replacing “dumb” windows with active photovoltaic glass as a way of capturing local electricity, these materials exemplify a reconsideration of the nature of the built environment. Every surface likely to receive steady illumination from the sun can potentially add to a location’s energy generation footprint. Other emerging photovoltaic materials, from cloth to paint, add to the variety of solar surfaces available this decade.



Signal: Embedded energy harvesting and storage

WHAT: Microscale devices that capture and store ambient energy (from light, from body heat, even from movement) are being made. Many are designed to be part of a larger system, rather than an add-on. Sensors, wearable medical devices, and small Internet of Things objects are already starting to take advantage of energy harvesting systems.

SO WHAT: Another catalyst for a reconsideration of the built environment and manufactured goods, energy harvesting and storage offer a pathway to creating tools that can be always-on and always-available without facing battery life issues. This becomes especially useful when the technologies need to be put in comparatively inaccessible locations, such as within walls or bodies.



Signal:

Sustainable plastic alternatives

WHAT: The damage done by plastic to the global environment is painfully clear. The need has never been greater for alternative materials to fill the same packaging and storage role as plastic without the resulting harm. If the material could also serve as a carbon sink, that would be all the better. Olive pits, sunflower hulls, mushrooms, and even urine show promise as bioplastics and “biostone.”

SO WHAT: A climate-positive organization recognizes that excess carbon emissions are symptomatic of a larger problem. The use of energy-intensive disposable materials isn’t sustainable in any way. Biology-based materials able to serve similar functions offer a way to continue using current forms of manufacturing and packaging in a way that has environmentally sustainable post-use life.



Signal:

Zero-carbon concrete

WHAT: By far the most common human-made material on the planet, concrete is also one of the largest sources of greenhouse gas emissions. Conventional production of the cement used in concrete involves burning limestone using powdered coal or natural gas at up to 3,000° F. Not only does the combustion release carbon dioxide, but the curing process does as well. The production of one ton of standard Portland cement releases one ton of CO₂.

SO WHAT: Solving the problem of concrete production would eliminate around 10% of global carbon emissions. Various low-carbon footprint techniques are in development, and one—from California-based Blue Planet—has a process for sequestering carbon in the concrete that produces net zero (and potentially net negative) carbon emissions.



3

Embracing Biotechnology

New tools to alter farming and remake ecosystems

According to *Nature Food*, “food systems” are responsible for 34% of global greenhouse gas emissions. This means that changes to the agriculture and food industries will offer myriad opportunities for aggressive climate strategies. Some improvements will come from new practices, some from re-engineered crops, and some from the large-scale replacement or even abandonment of some types of food.

Technological innovations will be an important part of the reinvention of agriculture. New farming practices and land-use methods are key, but the need to bring down carbon emissions rapidly—even while increasing output to meet the needs of a population likely to hit 10 billion by 2050—means that new technological approaches are needed.



3

Embracing Biotechnology

New tools to alter farming and remake ecosystems (cont.)

Many of these new techniques and technologies illustrate a real potential for *multi-solving*. Carbon-reducing or carbon-sequestering farming practices can improve soil health, reduce water loss, and allow for greater production. Novel food technologies can open up enormous economic benefits for developing regions.

And while agribusiness is the focus of this set of transformative changes, even organizations not directly connected to farming or food production will play a role in how this plays out. At minimum, organizations recognize that whether catered, provided at conferences, or available in business cafeterias, food choices *matter*. Some non-food organizations may wish to partner with agribusinesses of all sizes to share innovations.



Signal:

Farming carbon and food

WHAT: The agriculture industry has a massive problem: how to feed 10 billion people on Earth by 2050 while reducing agriculture's impact on the planet. One example illustrates the scale of the issue: holding global temperature increases below 2°C means that we must keep the greenhouse emissions from farming below 4 gigatons of equivalent CO₂ (GtCO₂e). At present, agriculture produces 12 GtCO₂e; with current practices, by 2050 this will be at least 15 GtCO₂e.

SO WHAT: New farming techniques and food-related behaviors seek to move agriculture from a net carbon-emitting industry to a potentially net carbon-sequestering industry. The Carbon Cycle Institute lists 27 carbon farming practices, derived from the USDA greenhouse ranking tool, that can measurably reduce agriculture's carbon footprint while improving soil health and potentially boosting output.



Natural Resources Conservation Service

United States Department of Agriculture

Topics

Programs

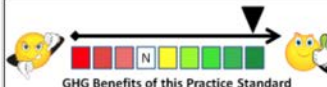
Newsroom

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GHG and Carbon Sequestration Ranking Tool

NRCS Practice Standards for Greenhouse Gas Emission Reduction and Carbon Sequestration

Qualitative Ranking N = Neutral	Practice Code	Practice Standard and Associated Information Sheet	Beneficial Attributes
	327	Conservation Cover	Establishing perennial vegetation on land retired from agriculture production increases soil carbon and increases biomass carbon stocks.
	329	Residue and Tillage Management, No-Till/Strip-Till/Direct Seed	Limiting soil-disturbing activities improves soil carbon retention and minimizes carbon emissions from soils.
	366	Anaerobic Digester	Biogas capture reduces CH ₄ emissions to the atmosphere and provides a viable gas stream that is used for electricity generation or as a natural gas energy stream.
			Capture of biogas from

Signal: Cell-cultured meat approved in Singapore

WHAT: In December 2020, the Singapore government approved the sale of chicken nuggets made in bioreactors. San Francisco-based Eat Just, which had focused on vegan egg alternatives, has developed a process to create meat products using chicken cells and a plant-based scaffolding. The product is more expensive than traditional chicken nuggets, but the cost is expected to drop considerably as production scales.

SO WHAT: The meat industry has a notoriously high carbon footprint, largely from the methane produced by livestock. Cell-culture meat has the potential to have a lower climate impact and offer a more ethical process. Multiple companies have begun to develop in vitro meat based on cells from everything from fish to cattle. Singapore's approval of commercially-available cellular meat is a major step towards broader adoption of the technology.



Signal:

C-Combinator turns harmful seaweed blooms into zero-carbon fertilizer

WHAT: C-Combinator, a Puerto Rico-based public benefit corporation, has developed a process for harvesting seaweed blooms for various agriculture industry products such as organic fertilizer and biostimulants. They're also researching ways to use the material for bioplastics, carbon fiber, and other materials.

SO WHAT: Seaweed grows quickly, and in doing so, pulls carbon dioxide from the oceans: a square kilometer of kelp sequesters over 3,000 tons of CO₂. Massive seaweed blooms can damage coastal ecosystems and disrupt ocean commerce, so harvesting the blooms can improve coastal economies, especially in the developing world. Current processing facilities are in Mexico and Puerto Rico.

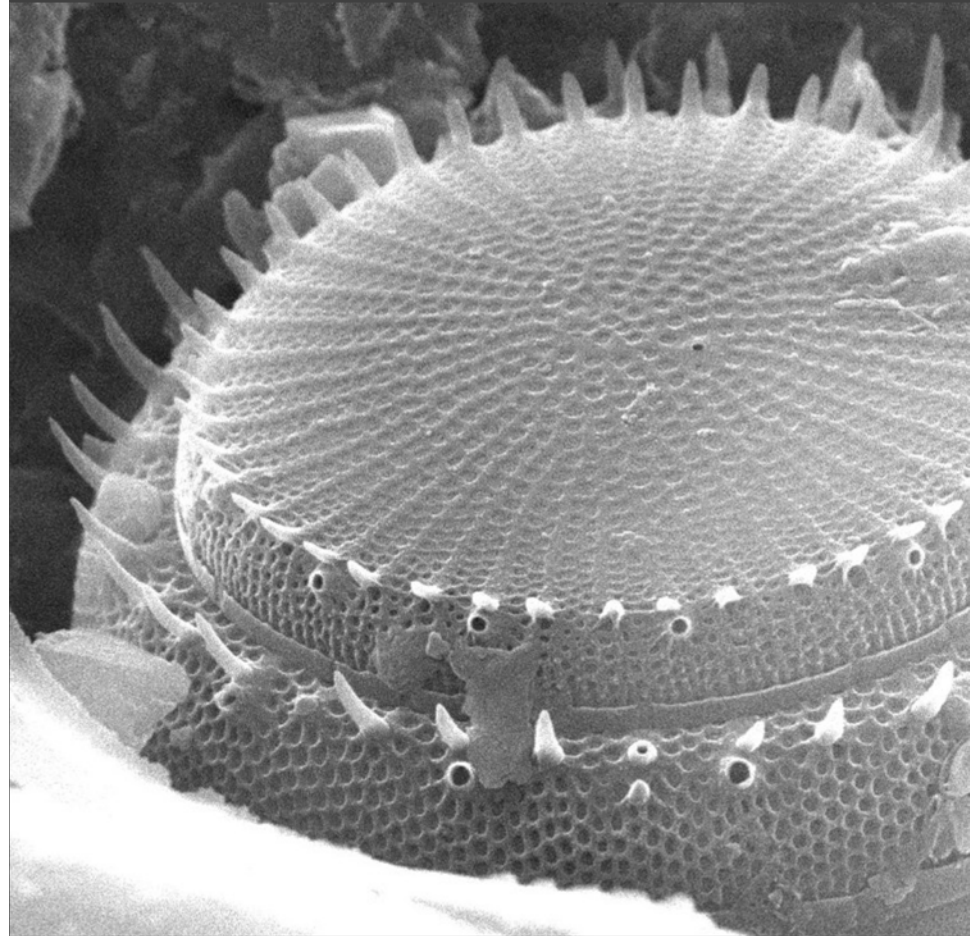


Signal:

Diatom biosequestration

WHAT: From the simplicity of the “Trillion Trees” initiative to the complexity of enhancing photosynthesis, the notion of biologically removing atmospheric CO₂ remains a popular desire. One novel approach being researched uses diatoms—a kind of microalgae found in abundance worldwide and responsible for up to 20% of global carbon fixation—to perform enhanced carbon sequestration in bioreactors, with the side-benefit of producing usable manufacturing materials.

SO WHAT: Biosequestration illustrates the drawdown dilemma perfectly—the potential for significantly reducing atmospheric carbon attracts interest not just from climate specialists but the fossil fuel industry. Diatom biosequestration adds the possibility of creating usable manufacturing materials, making it appealing beyond its climate value. As with all current carbon drawdown techniques, the research is still in the early stages.



30kV

X8,000

2µm

4

The Environment of Things

Networking built around living things for constant measurement and adaptation

Over the next decade, many organizations will need to pay close attention to the details of carbon emissions, energy use, and the impacts of climate disruption. The deployment of environmental monitors may be driven by regulation, insurance, or basic self-interest. Much of the data gathering and analysis will be done in-house, but some will be handled by a variety of emerging environmental data services.

All of this will rely upon increasingly sophisticated and diverse collections of sensors. Moreover, as the need for real-time data grows and moves into the consumer space, we'll see a growing need to weave sensing and data collection technologies into our physical space and materials. The "Internet of Things" may soon be reconceived as an "Environment of Things."

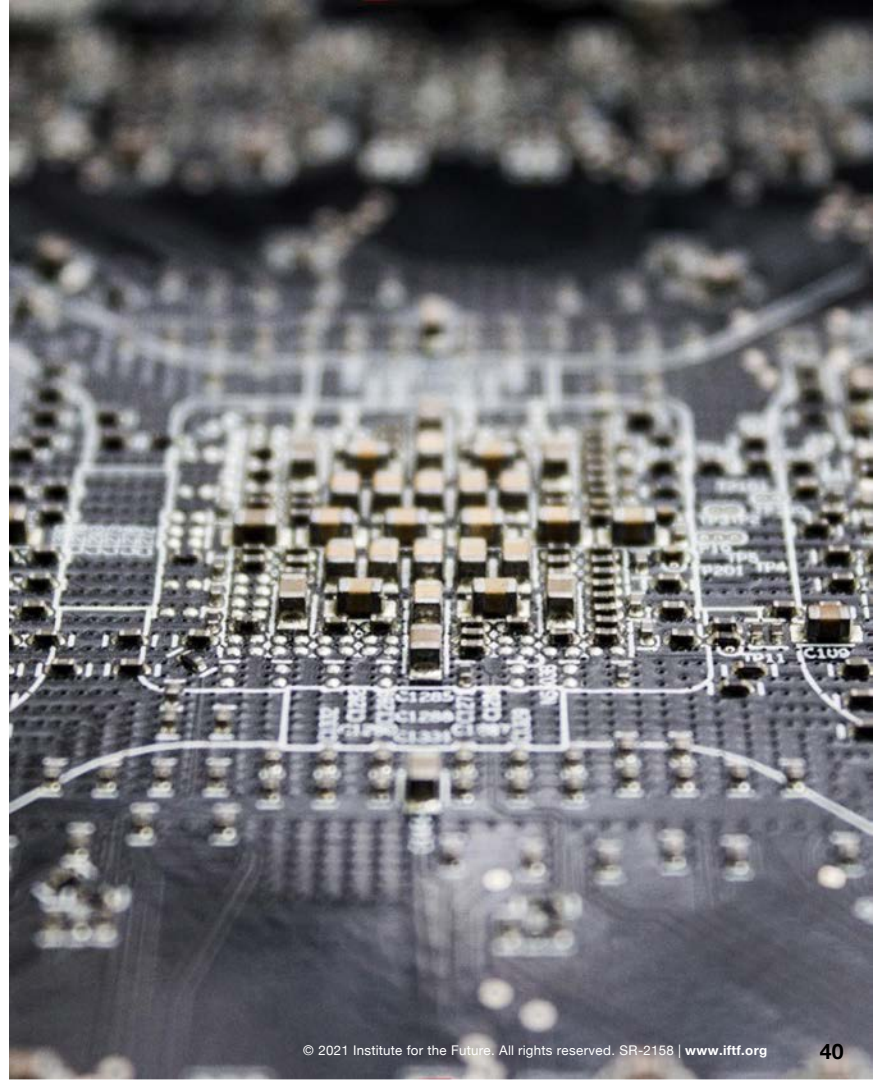


Signal:

Enterprise IoT creates opportunities for facility-scale emissions management

WHAT: Although the “Internet of Things” (IoT) may best be known for its dubious networked kitchen appliances and often shoddy security, the underlying technologies are proving to be a boon for meeting environmental and sustainability goals. Real-time monitoring and control of building conditions, energy use, water pumps, package location, and much more give businesses better tools for reducing their climate impacts.

SO WHAT: The key value of IoT systems is the combination of individual location monitoring and network-wide analysis. A single smart HVAC control, for example, is useful; a building-wide constellation of them allows for a detailed, real-time understanding of energy use and building environmental conditions. Much of the market enthusiasm around IoT devices comes from the consumer space, but the real power of the technology will be in organizational environment management.



Signal:

Ground truth weather detection tools provide hyper-local forecasts

WHAT: Auto dealers can face millions of dollars of inventory loss resulting from hailstorms. As storms worsen due to climate danger, insurance rates for auto dealers have skyrocketed. Insurance tech company Understory has created a sensor designed specifically to measure the intensity of a hailstorm; coupled with so-called “parametric insurance” (where payouts are based on measured incidents and not specific damage), the sensors allow for more precise “ground truth” measurements and forecasts.

SO WHAT: Watch for parametric insurance and ground truth weather detection to become common ways to grapple with uncertainty driven by climate disruption. The underlying technologies allow for greater precision in event recording, and they can create sophisticated models of changing weather behavior that will be useful to both insurers and the insured.



Signal:

Low cost space-based sensing

WHAT: The combination of the increase in availability of private space launch services and the low cost of “cube sats” and other nanosatellites has opened up a wealth of new opportunities for businesses, educators, and developing nations to deploy orbital sensors to track everything from environmental dust flows to organizational logistics.

SO WHAT: The need to monitor environmental conditions better will grow over the decade, and ground-based or mobile sensors may work better when paired with the “top-sight” provided by orbital platforms. Organizations of all kinds need to think broadly about the scope and scale of information gathering they’ll need going forward.



Signal:

Internet of trees measures impacts of increased tree planting

WHAT: The United Kingdom's DEFRA (Department for Environment, Food and Rural Affairs) is using Vodafone's Internet of Things technologies to understand the climate impacts of its plans to increase tree planting across the UK. Sensors will capture data including temperature, humidity, tree growth, and soil moisture. The study will focus on how trees capture and store atmospheric carbon.

SO WHAT: The use of off-the-shelf technology as the platform upon which an environmental sensor network is built illustrates the degree to which current Internet of Things systems can play a role in climate monitoring. In particular, this system suggests that existing IoT devices may take on double-duty by serving both as the original networked device and as a networked environmental sensor.



Insights



The changes will be staggering, so look for ways to leapfrog: It won't be easy to plan strategies and adapt systems to the next wave of change on the horizon instead of the current one. Keeping the big picture in mind (getting to zero carbon emissions) can help avoid being caught up in momentary controversies.

Cooperation will be essential: It's difficult to overstate just how world-changing both the challenges and the needed changes are. It's more than any one organization can control. Look for ways to cooperate and partner with other organizations, and keep an eye out for groups with parallel concerns which are outside your issue or industry.

Make the invisible visible: Steering in this time of acceleration requires the capacity to see ahead and see around. You can't reliably influence or improve what you can't identify. Track everything, and keep that data. Information that might seem useless now can become sources of insight, inspiration, or even revenue in the years to come.

Insights (cont.)



Don't be afraid to be afraid: The immensity of the climate emergency is beyond anything modern humans have ever faced. Being climate-positive doesn't mean being willfully blind to the scale of the problem.

Multi-solving and polymorphic thinking: The most powerful solutions and ideas will come from addressing multiple problems simultaneously and reshaping the organization to meet the needs of an entirely new world.

Look for ways to turn your footprint into a handprint: Every living entity, and every system we create, leaves a mark on the world. The climate footprint marks a path of taking more from the planet than we give. A handprint, conversely, signifies doing what we can to improve the survivability and resilience of the world in which we live. What can your organization do to give both the planet and the people it holds a better future?

economics

New approaches to sustainable and
equitable growth

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INSTITUTE FOR THE FUTURE

New Approaches to Sustainable and Equitable Growth

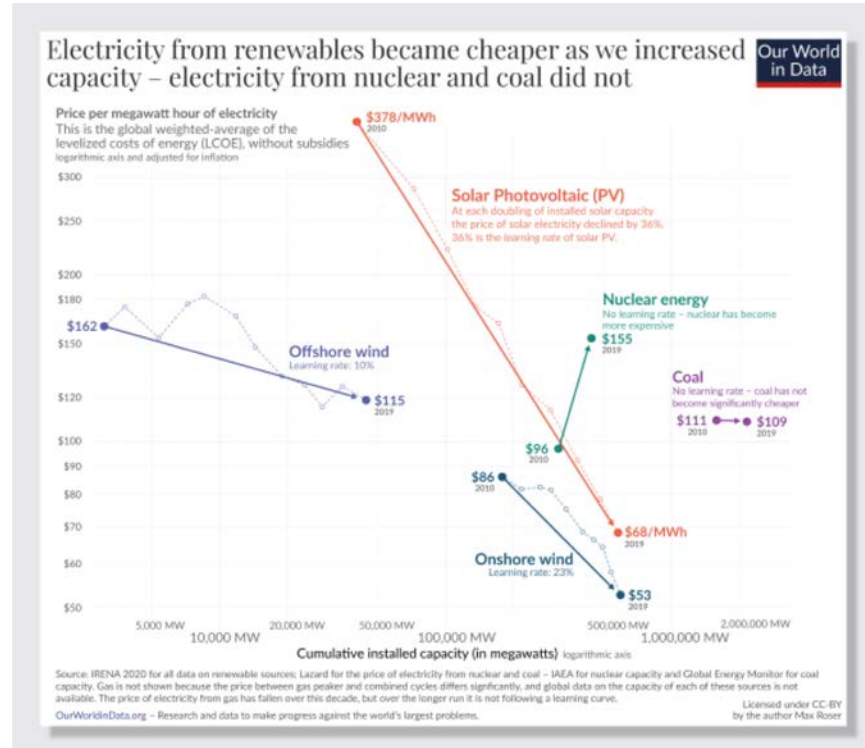
Currently, prosperity is achieved at a massive cost to ecosystems. Natural resources are viewed as assets for economic production and consumption, and our economic structures are designed to extract as much economic value as possible, value that is then enjoyed only by a small group. Growing income and wealth inequalities across the globe are often explained by the fact that increased worker productivity has increased profits but not wages.

New Approaches to Sustainable and Equitable Growth (cont.)

In other words, our economic systems have engendered today's climate crisis and socio-economic inequities. For that reason, conversations and activities associated with restoring and preserving planetary health must also contend with the vexing social, economic, and health inequities present in most countries. Becoming a climate-positive organization over the coming decades may require a transformation that both redefines growth within the limits of the environment and redirects economic activities toward more equitable forms of shared prosperity.

Decreasing cost of renewable energy

Until recently, low-carbon energy sources have been too expensive to implement widely. Now, in most parts of the world, renewable energy sources are the lowest-cost source of new power generation, undercutting fossil fuels (IRENA, 2019). Reductions in costs for solar and wind power technologies are projected to continue as competitive pricing and technological efficiency improves. The increasing competitive cost of renewable energy technologies could unlock the required transformation in the global energy sector.



Policy-driven engineering of economic incentives and markets

Tech-enabled solutions are making it possible for more industries to decarbonize. While penetration of these new technological capabilities varies greatly across sectors and countries, they are seeping into industrial production and agriculture as a direct result of government directives. From California's executive order mandating that all new passenger cars and trucks be zero emissions vehicles by 2035 to Germany's ban on single-use plastics, policy is resetting market conditions. In addition to government intervention, individual businesses and industries are enacting policy changes around sustainability requirements for suppliers. These shifts are slowly re-engineering the economic incentives and markets needed to support and scale decarbonization innovations and to help accelerate the energy transition.



Demand-driven transparency and accounting of full impacts from organizations and their products

After decades of greenwashing and muddled work arrangements, people increasingly expect companies to assert their climate-positive actions and commitment to equitable prosperity through comprehensive measurement and radical transparency. Consumers, shareholders, employees, and community members will drive toward a more sustainable and inclusive economy through proven behaviors and actions. Importantly, this transparent business practice is supported by consumers. People across the globe report an interest in supporting businesses that are working to repair the social and climate harms that exist today.

Purpose Gives Brands Permission to Profit

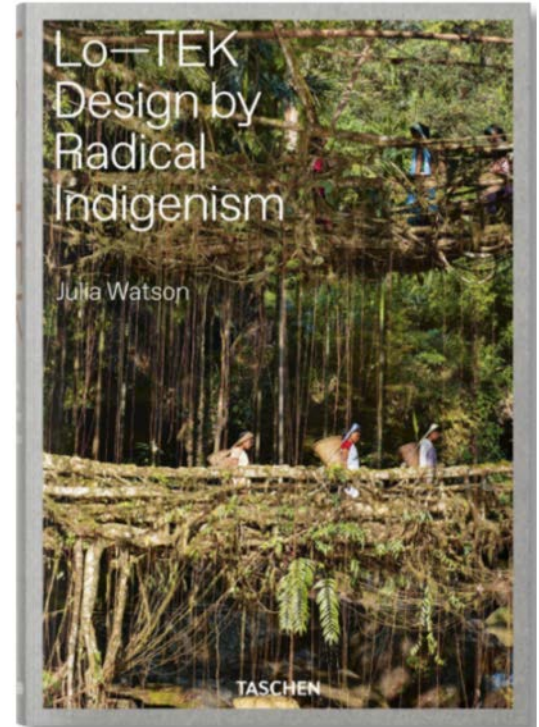
People across the globe are more likely to support a brand earning a profit if they also have a positive impact on the world.



Rise of indigenous design

Indigenous technologies are fueling the imagination of designers and architects interested in building climate-resilient infrastructures. Globally, buildings and the construction sector combined contribute to over one-third of global energy consumption. To reduce the environmental impact, architects, construction companies, designers, and engineers are looking to indigenous practices for sustainable and regenerative construction. These include place-based strategies that work with the environment as opposed to attempting to conquer it.

As Julia Watson, the author of *Lo-TEK: Design by Radical Indigenism*, explained, “We are looking for high tech solutions to deal with a problem that was created through this fascination with high tech and industrialization.” Integrating indigenous practices into modern building processes could yield climate-positive innovations that help restore natural ecosystems.



Experimentation with new forms of doing business

A growing number of businesses are pursuing social and environmental benefits instead of solely maximizing profits. This shift is driven by increased financial inequality, intensifying environmental degradation, and awareness of this vicious cycle. A 2018 Deloitte report found that 65 percent of CEOs rated “inclusive growth” as a top strategic concern, overriding “shareholder value” and “growing market share.” The growth of “for-benefit” enterprises points to an updated role of employers in the economic and environmental landscape.



Five Forecasts

1

Carbon Neutrality Through Insets

Investing in eliminating emissions to strengthen long-term operations

2

Regenerative Growth

Owning and mitigating the costs of negative externalities

3

Market Co-creation

Rebalancing public-private risk and reward

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Solidarity Dividend

Moving beyond the zero-sum economy

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The Rise of Steward-ownership

Owning and operating businesses to benefit future stakeholders

Carbon Neutrality Through Insets

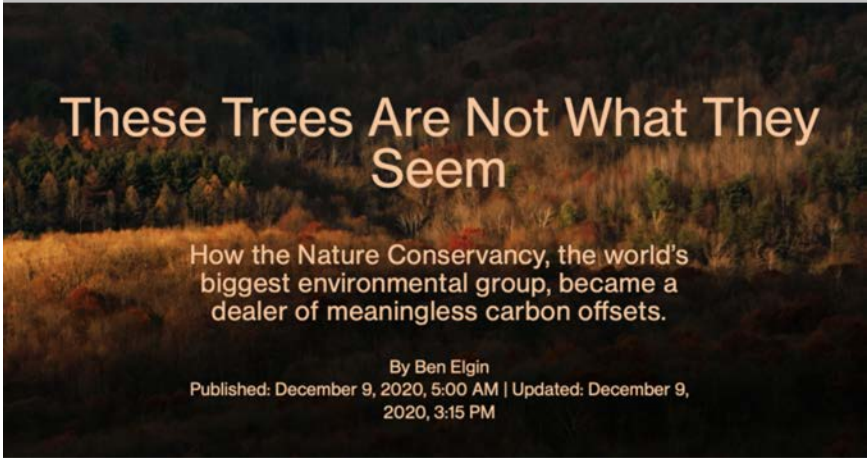
Investing in eliminating emissions to strengthen long-term operations

Organizations, countries, and cities have made public announcements and commitments to carbon-neutrality. These have resulted in a boom in the global carbon offset markets. Carbon offsets are an accounting tool that allows an entity to counteract its greenhouse gas emissions through purchasing credits or shares in efforts aimed at capturing or reducing carbon dioxide elsewhere. Over the next decade, however, climate-positive organizations will replace their reliance on carbon offsets as the central mechanism used to achieve net-zero emissions. These organizations will use climate insets to build climate resilience within their supply chains. Insetting aims to achieve climate positivity through direct investments to reduce greenhouse gas (GHG) emissions and promote carbon storage within an entity's own supply chain. Businesses will seek to operate without engaging in any carbon-emitting activities. They will instead favor activities that will contribute to regenerating the Earth's natural ecosystems. Implementing carbon offset projects within an organization's own value chain will not only reduce global carbon emissions, but will also deliver local, socio-economic benefits to the communities that support an organization's growth and prosperity.

Signal: Growing skepticism over the utility of carbon offsets

WHAT: The Nature Conservancy announced that it will conduct an internal investigation on its carbon offset projects after reporting uncovered that companies were buying credits for forests and land that “[were] never threatened; the trees were already part of well-preserved forests.” Some of the Conservancy’s carbon credits purchased by JP Morgan, Disney and BlackRock were intended to counteract their harmful carbon emissions. Those credits were converted to carbon payments issued to environmental groups to support the overall health of forests that are not at risk of being cut down.

SO WHAT: Heavy emitters rely on carbon offsetting to balance their harmful contribution to climate change. According to Bloomberg NEF, companies bought 93 million carbon credits, 33% more than were purchased in 2019. If increased scrutiny of carbon accounting yields more troubling findings around carbon payments, it may challenge the value of these financial instruments and may add to the mounting pressure to reject offsetting as a climate-positive policy.



These Trees Are Not What They Seem

How the Nature Conservancy, the world's biggest environmental group, became a dealer of meaningless carbon offsets.

By Ben Elgin

Published: December 9, 2020, 5:00 AM | Updated: December 9, 2020, 3:15 PM

Signal: Companies pioneering carbon insetting as long-term strategy

WHAT: Nespresso was one of the first companies to experiment with carbon insetting. Working with PUR Project, a pioneer in insetting programs, Nespresso is offsetting its carbon emissions and fortifying its coffee supply chain by planting trees to blend forestry and farming in a way to support the long-term health of the ecosystems where its coffee supply is grown.

SO WHAT: Nespresso is one of many European companies experimenting with insetting as a climate-positive strategy that helps offset their GHG emissions. They are restoring the ecosystems on which they rely and supporting small-scale farmers who are central to their value chain.



Signal: Forging connections between suppliers and producers

WHAT: Research has demonstrated that carbon insetting has potential to create “quadruple-win” outcomes (defined as social, economic, environmental, and productivity benefits) for all stakeholders in an agricultural value chain. This includes a 2015 study that examined the cattle value chain in Nicaragua and concluded that “smallholder farmers can and should be mobilised as part of any strategy at value chain level, to adapt to and mitigate the impacts of climate change.”

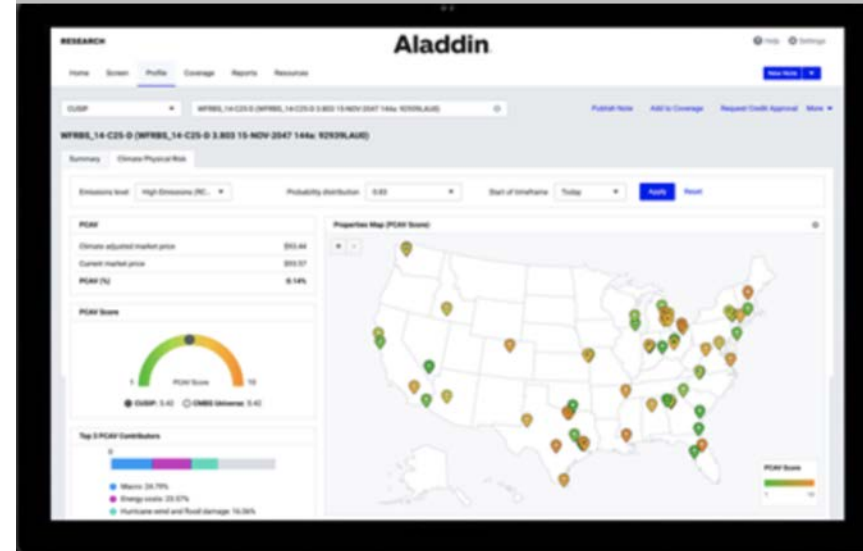
SO WHAT: Climate-positive organizations will need to experiment with novel approaches to build resiliency in their supply chains. From carbon insetting to payment for ecosystem services, climate actions and strategies should prioritize the economic and health security for suppliers and partners most affected by climate change.



Signal: Carbon risk tools quantifying climate change impacts

WHAT: Aladdin Climate is a risk management platform used by large pension funds, insurers, and institutional investors to improve how climate risks are measured through accounting for the consequences of climate change and the transition away from fossil fuels. Developed by behemoth money manager BlackRock, the tool allows investors to evaluate climate risks and analyze potential policy changes and new technologies. They do this through high-quality data and the machine-learning capabilities of the sustainability analytics and data science platform Clarity AI.

SO WHAT: Carbon accounting tools are in their nascent stage, and while the current version of Aladdin Climate does not delineate investments specific to climate insetting, it signals that more precise accounting and risk measurement tools will challenge climate-positive strategies that rely on carbon offsetting as opposed to addressing an organization's direct contributions to climate change.



Regenerative Growth

Owning and mitigating the costs of negative externalities

Mainstream business models assume a linear economy of “take-make-use-dispose” life cycles. Raw materials are extracted and converted into products, which are used and, eventually, discarded. The linear economic models don’t incent businesses to prevent waste, nor do they capture the total costs of pollution associated with the waste. Recently, however, more organizations and governments have been actively exploring a transition away from a linear economy toward a circular economy or a closed system which economist Kenneth Boulding described over 50 years ago as “the outputs of all the parts of the system are linked to the inputs of other parts.” A universal circular economy will not only halt the “throwaway culture,” it could also help to regenerate natural systems and promote sustainable growth.

Over the coming decades, foundations, governments, and individual organizations alike will work to scale up the experimentation underway in circular systems. They will implement the technical capacities needed to operate profitably within this model, the improved metrics to conduct life cycle accounting, and the directional changes in policy to mandate the transition. Climate-positive organizations will produce their goods and services with the entire life cycle in mind and with the understanding that widespread prosperity depends on the health of the natural systems around us.

Signal: Doughnut Economics offers a new model for local development

WHAT: The City of Amsterdam is embracing a circular economy framework called Doughnut Economics in an effort to recover from COVID-19. Doughnut Economics, first introduced in 2012 by economist Kate Raworth, is a framework centered around the nine planetary boundaries, the processes that regulate and stabilize Earth's life-supporting systems. It provides a vision to meet the needs of all people within the bounds of the environment.

SO WHAT: Part of this framework lays out the current modes of operation and juxtaposes it with principles humanity must employ if we wish to stay on this earth. For example, "from growth to growth agnostic" is a principle that flips the notion of GDP on its head – economic growth has been an indicator of economic health for decades, for entire municipalities to use this framework as a guide for thriving in the 21st century could fundamentally change production and consumption patterns, in addition to deeply held beliefs about economic growth.



Signal: Minimizing negative externalities of beef and dairy products

WHAT: A UK-based start up called Zero Emissions Livestock Project (Zelp) has created a wearable placed just above the cow's nose to capture the methane emitted as burps. The methane is then converted into the less harmful form of carbon dioxide. It is currently being tried with live animals. In addition to capturing methane, the Zelp masks are outfitted with sensors to help farmers monitor herd health and provide other metrics that will enable cattle producers to ensure the productivity of their herd.

SO WHAT: Methane is far worse for the climate than carbon dioxide, and as such, finding tools to limit methane emissions is particularly critical. Meat and dairy production may never have a truly circular model, but innovations like Zelp help organizations take incremental steps away from the long-standing linear models in place. By pairing an emissions-reducing mask with real-time tools to improve productivity, Zelp hopes to enable farmers to reduce emissions and increase profitability simultaneously.



Signal: Subscription model creates circular model for electronics

WHAT: Gerrard Street is a Netherlands-based company that produces high quality, modular (easy to disassemble) headphones on a subscription basis, so customers can upgrade or get repairs for free, forever.

SO WHAT: By incorporating circular economy principles into their business model, Gerrard Street is able to reuse 85 percent of the components of the modular headphones; the subscriptions system also embed an incentive for Gerrard Street to produce the highest quality, most durable products so they can maximize revenue.

**GERRARD
STREET**

HOW DOES IT WORK

PURCHASE

CONTACT

ABOUT US

FAQ

MY ACCOUNT



Market Co-creation

Rebalancing public-private risk and reward

In recent decades, much of the economy has been characterized by record private gains and devastating public losses – from extreme weather events to financial crises to global pandemics. Over the next decade, governments will play an increasingly active role in shaping markets. This is intended to share risks with the private sector, and importantly, to ensure the gains are shared with the public as well. Risk- and reward-sharing dynamics will be vital for an accelerated transition toward a clean economy and inclusive growth.

Neoliberal economics has depended on the free market for economic growth and innovation, limiting the government to a market fixing or interventionist role. Today's challenges have led to the growing consensus among the private and public sectors that the market alone is insufficient for addressing the systemic challenges in the economy. History has demonstrated how effective public-private partnerships can be – they have sent a man to the moon, invented the Internet, and more recently, produced an effective vaccine in record time. Harkening back to government spending in the post-war and depression eras, the government can use its power to back capital to be spent on activities that create environmental and social value. By harnessing the longer time horizons, prioritization of all people, and resources of the government combined with the expertise, scale, and agility of the private sector, public-private partnerships are poised to accelerate a transition to a decarbonized economy. Federal agencies and public institutions must facilitate the shift to a clean economy. Over the next decade, robust public-private partnerships will lead the charge in decarbonizing the economy, in turn creating new markets and investment opportunities for inclusive growth.

Signal: Success of COVID-19 vaccines points toward new direction for public-private partnerships

WHAT: The successful development and scaling of COVID-19 vaccines relied on public-private partnerships as well as considerable public investment in basic science that took years to prove extremely valuable. The success of this effort will not only renew interest in the value of these kinds of partnerships but provide lessons in how different sectors can coordinate to tackle ambitious goals.

SO WHAT: In a workshop for the National Academies of Science, John Lange, a senior fellow for global health development at the United Nations, argued that public and private sector leaders will learn several key lessons from COVID-19 vaccine partnerships. These lessons include collaborating before a crisis, investing across sectors in creating partnerships, and working with communities. The speakers in this workshop highlighted a larger need for partnerships to focus on building infrastructure to mobilize responses when needed—a critical lesson for partnership focused on climate action.



Signal: Federal Reserve Board creates “climate committees”

WHAT: Months after the U.S. Federal Reserve Board joined the Network for Greening the Financial System (NGFS), the Fed created the Supervision Climate Committee (SCC) and its macro complement, the Financial Stability Climate Committee (FSCC). These committees will be “charged with developing and implementing a program to assess and address climate-related risk to financial stability.”

SO WHAT: Almost always, capital goes to the highest rate of return, because the current economic system does not reward behavior that is beneficial for the planet. Now, the world’s monetary institutions are signaling a shift in what activities will be rewarded. They have broad mandates for stabilizing the economy and financial sector, and they are including climate change risk into their fundamental risk assessments. This is in addition to a \$2 trillion green infrastructure plan proposed by the U.S. President. More government spending in environmental, social, and governance (ESG) projects reduces investment risk for the private sector, attracting more investments and ultimately creating new markets for sustainable and inclusive growth.

Green

Fed Forming Committee to Prepare for Climate Change Dangers

By [Jesse Hamilton](#)

March 23, 2021, 10:25 AM PDT

Updated on March 23, 2021, 11:06 AM PDT

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- ▶ New panel to identify risks to financial system, Brainard says
 - ▶ Getting ahead of ‘tipping points’ a challenge, she says
-

Climate and Environment

Biden administration wants the financial sector to face up to climate risk

The Commodity Futures Trading Commission aims to create a new Climate Risk Unit, joining initiatives at Treasury, the Securities and Exchange Commission, and the Federal Reserve

Signal: A dynamic public investment institution

WHAT: Cornell law professors Saule Omarova and Bob Hockett have proposed a National Investment Authority (NIA), or a “publicly-owned BlackRock equivalent,” directly inspired by the New Deal’s Reconstruction Finance Corporation as an institutional mechanism for economic mobilization. It would devise and implement long-term strategies for national economic growth and infrastructure development. It would play a key role in coordinating national production mobilization efforts, emergency financial relief, corporate bailouts, and transparent coordination and management of public stakes in private companies.

SO WHAT: The proposal for a National Investment Authority is a call for the government to re-engage meaningfully as strong actors in the economy and to use their power to back money on initiatives that are value-creating for humans and the planet. The financial system is the critical link connecting these big infrastructure plans to who will actually benefit in the future. The NIA represents a transformational opportunity to ensure that infrastructure investments are directed and managed in the most underserved and disenfranchised communities and regions.



4

Solidarity Dividends

Moving beyond the zero-sum economy

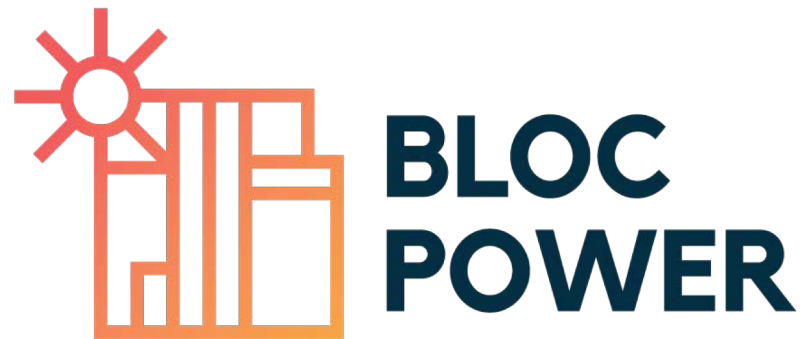
Centuries of racial injustices, the climate crisis, and economic inequities have largely been discussed as separate issues. More recently, these issues are being viewed as converging – these crises cannot be solved without addressing all of them. In her recent book *The Sum of Us: What Racism Costs Everyone and How We Can Prosper Together*, economist Heather McGhee outlines many examples of the economic and social costs of racism for all Americans, from the financial crisis to deteriorating public infrastructure. She also finds evidence of a reality she calls the Solidarity Dividend, which describes the “gains that come when people come together across race, to accomplish what we simply can’t do on our own.”

While technological advances are crucial to meeting the 1.5° C temperature increase threshold determined by the Paris Climate Agreement, there are strong social, economic, and political obstacles that come with this transformation to a decarbonized economy. The massive resistance to divesting from fossil fuels has exposed the long, entrenched relationship between political and corporate power. Climate-positive organizations will view racial injustice, economic inequities, and the climate crisis as inextricable, resulting in a fundamental shift in business practices that will put human dignity and the environment at the center of their operations. Growth for these organizations is defined by their ability to tackle systemic issues that have resulted in urgent global crises. The question becomes: how many benefits and social value can we create through this investment or enterprise?

Signal: BlocPower fills investment gaps in historically marginalized communities

WHAT: BlocPower is a climate technology startup on a mission to make American cities cleaner, smarter, and healthier. The company retrofits buildings in disadvantaged communities and neighborhoods in New York City using its proprietary software (non-combustion heating yields cleaner air and lower asthma rates) and heat pump systems that save customers between 20-70 percent on annual energy costs, with no money down and no loan. BlocPower also partners with organizations to address the environmental justice needs of all stakeholders in the communities where they operate.

SO WHAT: BlocPower is filling the investment gap in neighborhoods that have been historically marginalized and have been disproportionately affected by climate change. Traditional investors lack incentive to invest in these neighborhoods, directing money and these activities to systematically devalued regions accelerates the overall transition to a clean economy effectively building racial, economic, and climate justice.



Signal: European Union's new ESG taxonomy disclosure standards to have ripple effects

WHAT: The European Union, which is striving to be the first climate-neutral continent, recently began requiring all fund managers raising money in the EU to disclose how they approach environmental, social, and governance (ESG) issues.

SO WHAT: While these mandates are coming from the EU, any company that does business within the EU must adhere to these disclosure requirements. Investing in ESG, via everything from combating climate change to broader gender representation on boards, has come under scrutiny for being too loose with its reporting requirements. This new requirement from the EU will force companies operating in the region to disclose important indications of commitment to advancing ESG issues. This is a huge step toward a universal standard of reporting and will produce ripple effects throughout the global financial sector.



The Rise of Steward Ownership

Owning and operating businesses to benefit future stakeholders

Cooperatives, mutual organizations, for-benefit corporations, employee-owned companies, and other corporate structures offer alternatives to the common shareholder model of governance. Over the coming decades, climate-positive organizations will move away from ownership models toward stewardship approaches, relying on tools such as perpetual purpose trusts, in which the beneficiary of the trust is the purpose of the business.

Putting an organization's purpose on par or even above profits, steward-owned organizations can allocate funds to support future stakeholders, manage proceeds from acquisition or exit strategies, and direct profits back into local communities or social causes. A transition toward more steward ownership will lead to more climate-positive organizations, because it will relieve business leaders from the short-term demands of shareholders and financial markets. This will deemphasize measurements such as quarterly profits and will emphasize longer-term orientation to account for the present and future health of people and the planet.

Signal: Limits to purpose in shareholder model

WHAT: Activist investors in the United States successfully forced the resignation of Chief Executive and Chairman Emmanuel Faber of Danone SA, claiming underperformance as compared to its competitors. Faber is well-known for his interest in a “food revolution” that focuses on human and planetary health. Experts suspect that the growth model championed by Faber, one that balanced profits and sustainability, is the primary explanation behind his ousting by the investors.

SO WHAT: Shareholder primacy—the interests of shareholders take priority—challenges the ability for an organization to conduct business in a way that does not maximize the value for shareholders. Unless the fiduciary duties center on a broader set of stakeholders, shareholder primacy may limit the climate-positive strategies available to an organization.

Our unique
GROWTH MODEL

BUILD A BALANCED MODEL OF GROWTH

Danone has set its goal to build a balanced, profitable and sustainable growth model.

Signal: Growing interest in alternative ownership conversions

WHAT: Both not-for-profit advocacy groups and investment banking firms are building out their consulting and advising services for steward-ownership. The organization Purpose is a leader in the field, working to make steward-ownership more accessible and easier for mission-driven businesses by providing consulting services and investment options. Purpose also aims to increase awareness of alternatives to conventional ownership models through conducting and releasing research studies and creating open-source resources including legal forms, template charters, term sheets, and tax analysis.

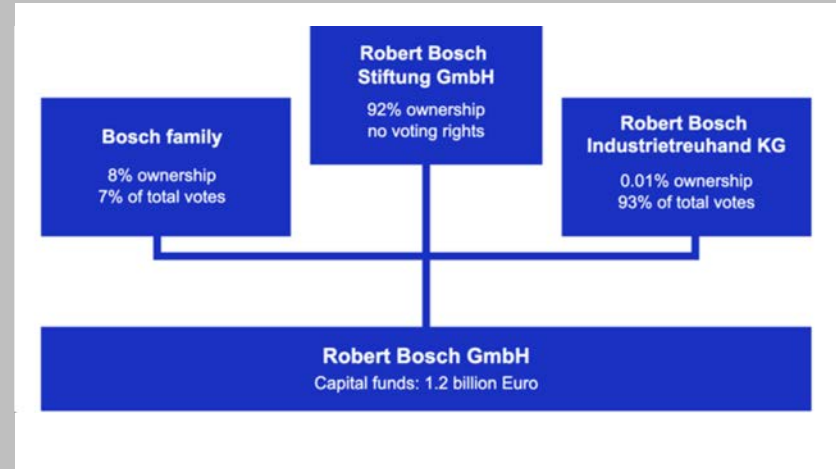
SO WHAT: Transitioning from shareholder or private ownership to steward ownership requires new governance, legal and financial structures, and strategies. The growth in advisory services and open-source resources will allow more mission-driven organizations to convert to the relatively new ownership structure of stewardship.



Signal: Redesigning corporate structures

WHAT: The German engineering company Bosch operates under a trust-foundation structure, in which 93% of the company's voting rights are held by Robert Bosch Industrietreuhand KG, similar to a limited liability partnership, and 92% of the dividend rights are controlled by the Robert Bosch Charitable Foundation. (The Bosch family retains control of the remaining voting and distribution rights.) By structuring the voting rights to fall within a trust and the economic rights to be controlled by a foundation, the company cannot be sold to external investors, and its dividends are donated to support education, health and global issues.

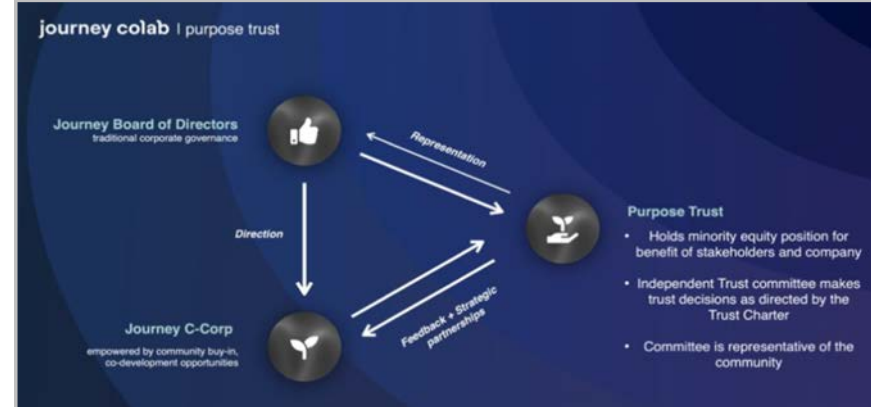
SO WHAT: Employing almost 400,000 people, the Bosch Group is one of the largest global steward-owned businesses. While legally and structurally complex, the trust-foundation model has enabled the company to enjoy financial success while preserving the social missions of the founder.



Signal: Designing for control over exit strategies

WHAT: Biotech startup Journey Colab placed 10% of shares into a trust stewarded by a board of representatives from the indigenous community, conservationists, and scientific researchers. If it goes public or is acquired, the Journey Reciprocity Trust holds equity for indigenous communities, for those involved in “building an equitable mental health sector,” and for other ecological conservation organizations.

SO WHAT: There are limited exit strategy options for most small businesses owners and startup founders, and it’s nearly impossible for many to secure a succession plan that aligns with their environmental and social values. Increased uses of Perpetual Purpose Trusts (PPTs) may help ensure that the purpose of the organization lives on even under new ownership.





Incremental change will be insufficient: A complete overhaul of our economic systems is the sensible pathway forward for climate-positive organizations, but it can feel overwhelming. Most organizations currently make incremental changes to move from climate-harming to climate-neutral behaviors. Their hope is that the cumulative total of their actions to preserve and nurture planetary health will outweigh any negative contributions. This approach won't work over the next decades.

Carbon accounting is a start but not an answer: Carbon accounting approaches such as offsetting and other climate mitigation and adaptation strategies may aid in emission reduction and climate neutrality, but they will not suffice for an organization to be considered climate-positive over the coming decades.

insights (cont.)



Connect climate with labor policies: We know that the value-extractive and linear economic models have stressed our ecosystems to the brink. We also know that shareholder capitalism has produced high social, racial, and economic inequities and stark health disparities. In the future, a climate-positive organization will not have structural reliance on exploitative labor and finite natural resources, but instead will pursue collective social and economic well-being along with safeguarding and supporting the health of the planet.

insights (cont.)



Prepare for internal transformation: For many organizations, becoming climate positive will require a transformative undertaking in how they are structured, owned, governed, and operated. Fortunately, advances in alternative energy sources and carbon capture technologies are rapidly developing and deploying, making it more technically feasible for organization to decarbonize. Enabling policies from all levels of government are helping to co-create markets and bridge the transition from a linear economy toward viable economic models and ownership structures that are more sustainable and equitable. Many employees, suppliers, and customers are welcoming—if not demanding—the participation of organizations in helping to create a climate-positive future.

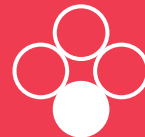
insights (cont.)



Identify growth strategies within planetary limits: Momentum is building for bold, ambitious change that transforms organizations away from climate neutrality toward climate positivity. Organizations will have to reduce harms and redefine what it means to grow within the planetary boundaries described in the Doughnut Economics framework. Looking out long-term and working your way back to the present could help guide the transformation. A futures-back view will help you envision a world where climate-positive organizations thrive, and it will prompt you to ask this question: How many social and environmental benefits can we create through every investment we make?



VANTAGE



**2021–2031 Map of the Decade:
Building Climate-Positive
Organizations 3 of 4**

governance

Governing climate with and without
governments

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INSTITUTE FOR THE FUTURE

Climate Governance With and Without Government

Climate governance in 2021 is a thicket of ideological entrenchments, misaligned economic incentives, and global/local jurisdictional confusion. At the global level, leadership remains weak, and even modest goals are not being met. At the local level, however, thousands of cities and regions are enacting creative and effective policies. These policies are not yet systematically coordinated, hence some of the complexities we expect over the coming decade. However, informal collective learning is happening, and civic communities of practice are forming (like the local nodes and networked labs of [Project Drawdown](#)).

Researchers look to climate policy innovators and early adopters in regions and countries like Scandinavia, Morocco, and Costa Rica, and in metropolitan areas like Los Angeles, Santiago, and Curitiba. Will regional and local innovation create enough of an impact at scale to shift the needle of global climate outcomes?

Climate Governance With and Without Government (cont.)

For aspiring climate-positive organizations, this poses major challenges:

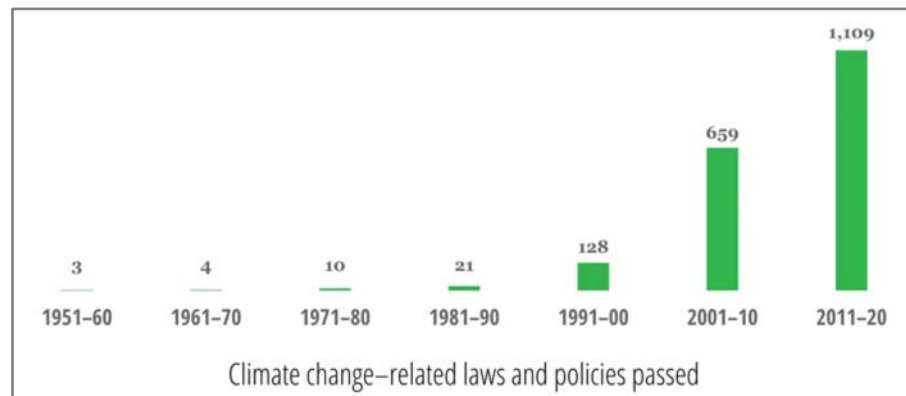
- How to identify and understand the myriad local provisions and approaches to climate governance that you may encounter
- How to compete when other organizations may use policy ambiguities to cut corners, save costs, and create strategic advantages for themselves in the marketplace
- How to determine whose rules and regulations to follow at what time and at what cost
- How to remain competitive while still raising industry standards.

The challenges facing organizations are large, but not insurmountable. Public desire for sincere and effective climate response from business is high and rising. Organizations must learn to navigate global climate governance regimes that are at times ambiguous, fragmentary, contradictory, or even hostile to positive climate outcomes. They must learn to harness and amplify public sentiment toward government action, and they must lobby for appropriate and consistent regulations and accountability. This section looks at the forces driving climate governance and presents signals and examples of ways organizations and citizens are dealing with these complexities.

Climate change laws are increasing rapidly

While the type, target, and impact of climate change laws vary greatly, the sheer number of new laws on the books globally has increased significantly, with over 90% of new laws passed in the last 20 years, and over 50% in the last 10 years.

For organizations, trying to keep up with new regulations and policies across jurisdictions will be difficult. As regulatory patterns emerge, so will more consistency and certainty for organizations to build their strategic responses.



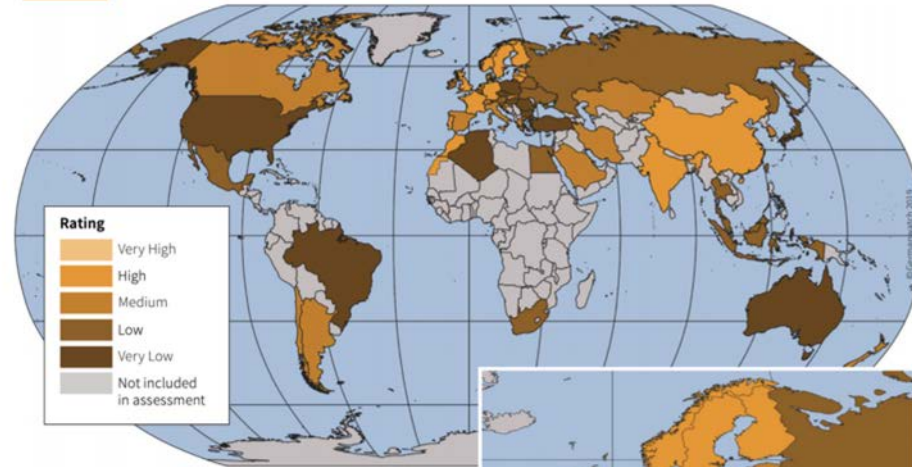
Climate policy is widely divergent

The recent Climate Change Performance Index shows both steady improvement in climate policy in many nations, and major regressions in places like the United States and Brazil. Beneath national divergences in policy and performance, there are also sub-national divergences. This fragmentation makes global coordination of climate response more difficult, and it could slow or reverse the necessary gains needed to avoid the worst scenarios.

Organizations should identify the innovators and early adopters and craft strategic responses to those standards, even if standards are different in other places.



3.4 Category Results – Climate Policy



Key developments: Political momentum grows but ambition and implementation still fall short

Increasing public awareness, harnessed by a growing global climate movement, is putting pressure on governments to make climate policy a priority. The run-up and outcomes of elections in several countries this year underlined that climate is an increasingly important issue for voters. Yet, the ambition put forward by countries at international level as well as their national-level implementation of policies are not sufficient. The year 2020 is the first opportunity for Nationally Determined Contributions (NDCs) to be updated and implemented.

Very few countries are meeting Paris Climate Agreement goals

Even with the modest, incremental goals of the Paris Agreement, very few countries have managed to meet their commitments. This broad failure has reduced trust in the international community to address climate through traditional governing relationships and institutions. Anger and desperation are pushing other organizations into the solution space.

Organizations that can contribute positively to helping their nations meet the Paris Agreement goals will drive climate progress and engender global goodwill.



Political will vs. climate action gap

Two-thirds of Americans surveyed said that the U.S. federal government is not doing enough to protect the environment and deal with climate change. This gap between political will and political action will increase public dissatisfaction with elected officials and will likely lead to more direct action by climate activists.

Organizations will be expected explicitly or implicitly to take the lead and compensate for limitations and failures of government. Climate-positive organizations will win praise, while those seen as laggards or hostile to climate progress may see protests and boycotts.

Majorities of Americans say the federal government is not doing enough to protect the climate, environment

% of U.S. adults who think the federal government is doing too little to ...



Note: Respondents who said the federal government is doing about the right amount or doing too much and those did not give an answer are not shown.

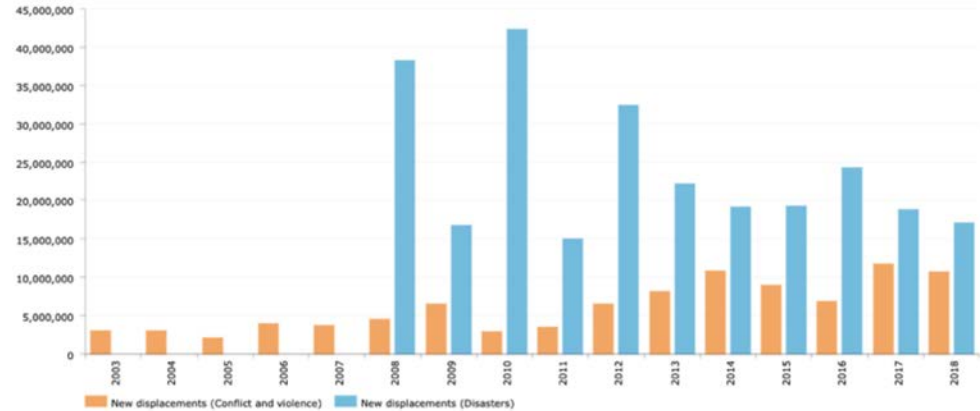
Source: Survey conducted Oct. 1-13, 2019.

"U.S. Public Views on Climate and Energy"

Climate migration becomes a global crisis

International migration due to environmental disasters already outpaces migration due to political conflict and violence. This trend is expected to continue and accelerate over the coming decades, putting enormous pressure on nations to deal humanely with these migrants, and to address the root causes of their displacement.

Organizations will be faced with a more precarious workforce and customer base. Systematically and humanely addressing and aiding these migrants will be a key factor in climate-positive responses.



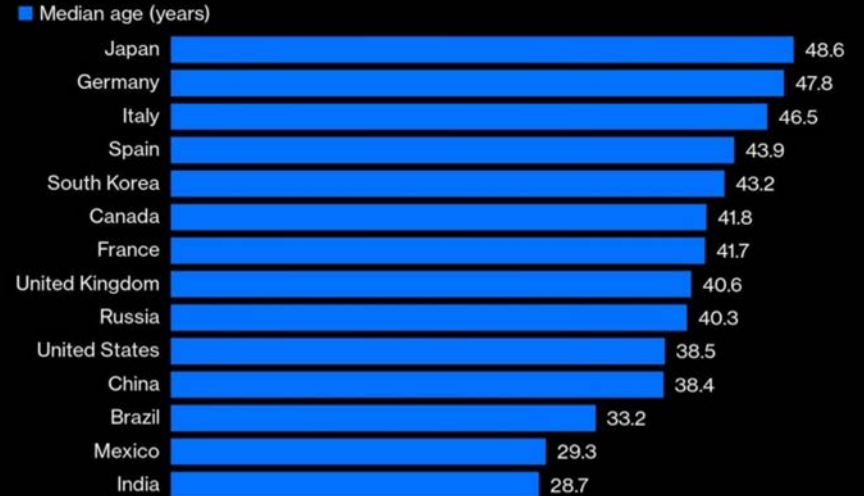
Aging, advanced economies

Some of the world's largest economies are facing new challenges as their average population grows older. The economic stresses of aging populations may make environmental policy harder to enact if it is seen as an additional challenge.

Climate-positive organizational strategies may already face resistance, but a potential economic slowdown due to demographic shifts could put even more pressure on businesses to deliver profits before protecting the environment.

Getting Older

Japan is the world's oldest major economy



Source: CIA World Factbook

BloombergOpinion

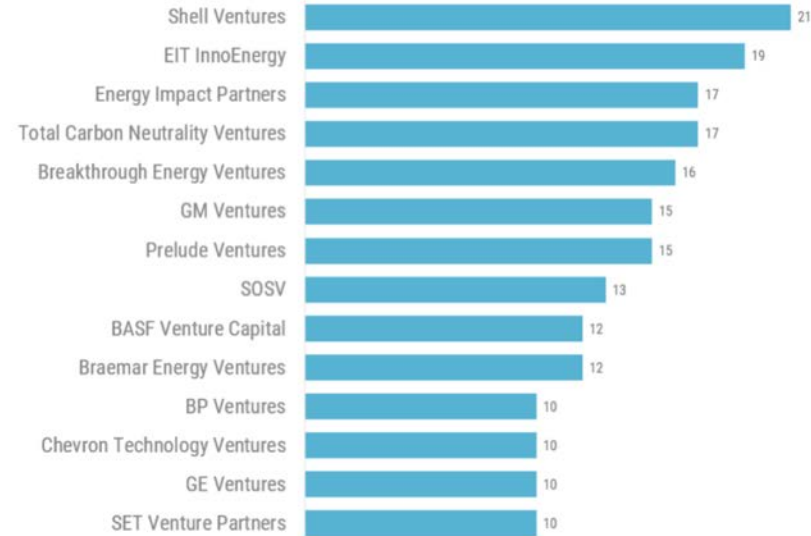
Private companies and public innovation funds are leading renewables investment

Large energy players like Shell and BP are joined by private venture funds and public efforts like the EU's EIT InnoEnergy investment fund in leading investment efforts into renewable energy technology.

This combination of private and public investment will likely remain the predominant pattern for the coming decade, and it will define the contours of the renewable investment ecosystem. Public-private coordination will be a key factor in how successful the climate-positive transition will be.

Top investors in renewable energy tech

By unique deals, 2016 – 2020 YTD (12/8/20)

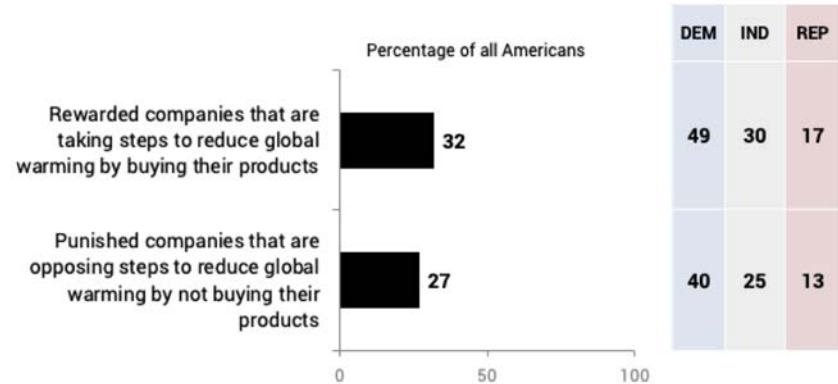


Consumer activism rising on climate

According to a Yale survey, about 1 out of 3 Americans said they bought a product or service because of the company's stance on climate, and 1 out of 4 said they punished a company who is working to oppose climate action by not buying their product. Consumer decisions based on a company's stance on climate are expected to rise over the coming decade.

Organizations will find it hard to be politically invisible or neutral, as the Georgia voting law controversy has demonstrated for Coca-Cola, Delta Airlines, and Major League Baseball. A similar dynamic will play out with organizational stances on climate policy.

About One In Three Americans Engages In Consumer Activism on Global Warming - % one or more times -



Over the past 12 months, how many times have you done the following?

- Rewarded companies that are taking steps to reduce global warming by buying their products.
- Punished companies that are opposing steps to reduce global warming by NOT buying their products.

November 2019.

Four Forecasts

1

Looking for Leaders

New actors filling a void of global scale inaction

2

The Rise of the Entrepreneurial State

Governments accelerate innovation and consolidate geopolitical advantage

3

Facilitating Just Transitions

Governments address the systemic roots of the climate crisis

4

Embedded Climate Governance

The emergence of automated enforcement

1

Looking for Leaders

Filling a void of inaction

As the impacts of climate change regularly hit closer and closer to home for more people, the search for climate leaders will intensify. National politicians have been reluctant to spend political capital on aggressive climate policy, but visionary state and local officials are filling the vacuum. Moreover, frustration with the public sector has led to more active leadership from business executives, philanthropists, and other private sector actors. Surveys and insights on values-based consumers show growing impatience with slow-moving and ineffective government responses.

Many people want someone to do something. High-profile moves by companies and organizations will be rewarded by people looking for leadership and real solutions to the climate crisis. This desperation for leaders will also lead to demagogues, opportunists, and others who would manipulate people's fears for their own agendas. Extremist violence, like the shooting in El Paso, Texas in 2019, has been directly linked to right-wing climate protectionism and vilification of outsiders.

Signal: Criminalizing ecosystem destruction

WHAT: A group of prominent lawyers specializing in environmental and international law have drafted a detailed plan to make ecocide—the intentional destruction of environmental ecosystems—an enforceable crime. In contrast to corporate law violations, which hold the corporate entity, rather than the executive decision-makers, legally responsible, this effort would enable the international criminal court to hold senior business and political leaders individually responsible for ecocide.

SO WHAT: While this effort is in its early stages, it hints at a broader desire to reform and strengthen climate protection laws. The criminalization of environmental destruction would add a significant check on wanton corporate actions that harm the environment. The impunity with which companies act and offload their responsibilities has been an impediment to stronger action against these activities.



Signal: The next billionaire vanity project: a climate action plan

WHAT: Bill Gates' Breakthrough Energy Fund, Jeff Bezos' Earth Fund, and Elon Musk's \$100 million contribution to the X-Prize for carbon capture technology are examples of the billionaire class taking on climate change in a serious way.

SO WHAT: No one would complain about the resources and attention these billionaires are bringing to the climate table. But their proposed solutions skew toward the technological "silver-bullet" model, rather than a more systematic transformation of our relationship to nature, energy, and the material world. Not surprisingly, these efforts seem geared toward keeping things as close to the current power and economic structures as possible. Climate-positive organizations will have to weigh their values against these kinds of techno-solutionist interventions.



Signal: Ernst & Young report calls for more regulation

WHAT: Ernst and Young's recent report, *Climate change and sustainability: Global regulators step up the pace*, argues that regulators are increasingly looking at financial disclosures as a means to regulate climate. They note that in the business community, "there is huge momentum in driving a regulatory response, driven in part by ever-increasing conviction regarding climate change and sustainability risks, political commitment, public policy action, and investor focus."

SO WHAT: As a clear signal of the shift in the operating paradigm for large companies, this report provides a rationale and blueprint for companies to engage with government regulators to provide the policy and legal architecture for climate-positive business. The report's authors note that despite the growing interest in the intersection of financial disclosures and greenhouse gas emissions, most businesses are struggling to integrate carbon measures into their financial reporting data.

Climate change and sustainability: Global regulators step up the pace

Challenges and opportunities for
financial services



The Rise of the Entrepreneurial State

Governments accelerate action and consolidate geopolitical advantage

In a trend that reverses the last two generations of neoliberal-dominated regulatory policy, private companies are increasingly demanding governments take a more interventionist role on climate regulations. Companies want clarity, certainty, and stability from governments. According to cyclical growth theorists like Carlota Perez, economic and social “golden ages” occur when governments reassert their responsibilities to spark, support, and protect fair market mechanisms while incentivizing those markets to deliver widespread public good. Economist Mariana Mazzucato, whose research on the entrepreneurial state has gained traction for recasting the role of government as an investor in creating markets, has called for “moonshot” policy regimes to re-engineer macro-economic rules to produce social, economic, and environmental benefits. As these theories increasingly push governments to take on a more active role in climate action, national governments have begun to compete over questions of which nations will create the IP, infrastructure, and supply chains that will enable them to be global leaders in the next generation of energy and climate technologies.

“

Because markets will not lead a green revolution on their own, government policy must steer them in that direction. This will require an entrepreneurial state that innovates, takes risks, and invests alongside the private sector.

”

–Mariana Mazzucato

Signal: Expanding climate change disclosures

WHAT: In her research on the entrepreneurial state, Mariana Mazzucato argues that bureaucratic levers—such as procurement, disclosures, and similar functions—can help states to push aggressively for change. A recent move by the U.S. Securities and Exchange Commission hints at this kind of potential. It has asked for input from “investors, registrants, and other market participants” on what information about companies’ climate activities would inform their investment decisions.

SO WHAT: The updating on climate-related disclosures is necessary to meet the new expectations of investors and watchdogs who are weighing “risks, impacts, and opportunities” related to climate. It is noteworthy that the SEC is making this a more open process where investor-driven data requests can guide policy. Climate-positive organizations can use these new disclosures to draw investors and compare their actions with others in their industries. These metrics will improve knowledge and climate transparency.



Signal: Petaluma, California bans new gas stations

WHAT: National and local legislators are using these levers of influence. The city of Petaluma, California has made permanent a previously temporary ordinance banning construction of any new gas stations and banning addition of any new pumps at existing stations.

SO WHAT: In the 1980s, local bans on Styrofoam to-go containers pressured fast food restaurants to discontinue their use entirely rather than comply with various local packaging ordinances. As local regulators gain influence as climate actors, climate-positive organizations can anticipate compliance trends and begin forward-thinking practices now.



Signal: Climate tech nationalism emerges

WHAT: While carbon-based energy policies have shaped geopolitics for the last century, sustainable energy policies will shape this century's geopolitics. Beyond energy sources, technologies such as battery storage—and the materials needed for batteries—are prompting political leaders to view climate tech as both investment opportunities and ways to assert international dominance.

SO WHAT: In a recent investor report, Bank of America argued that we should anticipate a “climate war” over the coming decade as “Energy independence and supply chain control are also at stake with the geopolitical balance of power.” The emerging geopolitics of clean tech will spark huge government investments in foundational technologies.



Facilitating Just Transitions

Governments look to address the systemic roots of the climate crisis

The concept of “just transitions” acknowledges that climate solutions cannot be separated from health, economic, social, and political justice. Evidence is emerging that addressing these issues systemically provides mutually enhancing benefits that are greater than the sum of their parts.

Concepts like multi-solving, wherein long-term climate-focused initiatives pay immediate social or economic dividends, are demonstrating that intersectional, systems-level approaches are not only possible, but also more effective and easier to sell to the public and to politicians. Climate-only initiatives that ignore other justice initiatives will increasingly be judged as not actually climate-positive.

Signal: White House Environmental Justice Advisory Council

WHAT: The Biden Administration has launched the first Council to address systemic issues of environmental racism and injustice.

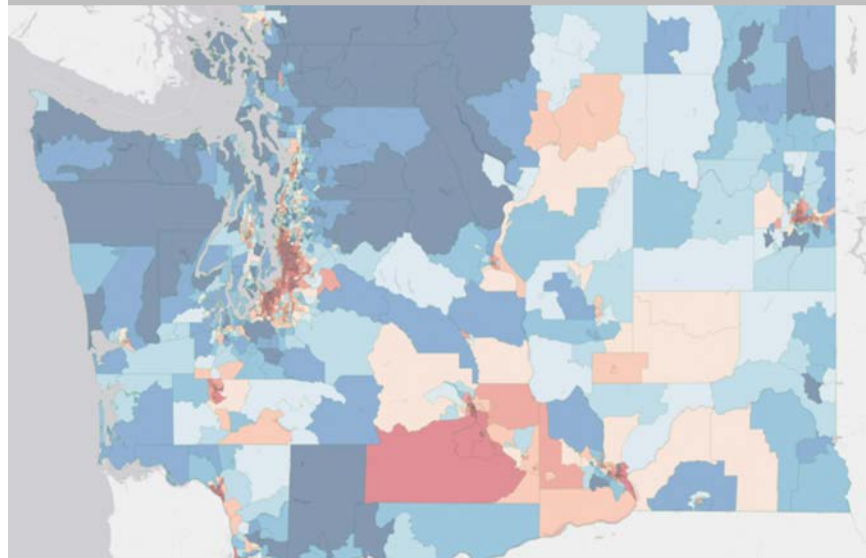
SO WHAT: Alongside the White House Environmental Interagency Council, this is yet another signal that the Biden White House is taking a systematic approach that integrates policies on health, racial justice, and food. Climate is clearly an organizing principle for overall policy.



Signal: Washington Environmental Health Disparities Map reveals risks and target areas

WHAT: The University of Washington worked with partners across the state to develop an interactive map showing the cumulative health risk for neighborhoods based on environmental factors. By synthesizing 19 environmental health risks, ranging from traffic density to noise pollution, into a single risk factor, the map helps decision-makers identify ways that climate interventions can address multiple problems.

SO WHAT: This kind of high-resolution view of connections between environment and health (and other disparities) will help facilitate systemic responses to climate-related negative outcomes.



Signal: Solar panels on school lead to pay raises for teachers

WHAT: Batesville, Arkansas installed 1,500 solar panels on their schools, saving an estimated \$600,000 in energy costs. This allowed the school district to give its teachers up to \$15,000 pay raises.

SO WHAT: Multi-solving with clean energy paid immediate economic benefits to teachers and the community. Organizations should look for these climate-positive opportunities.



“

If you can solve air pollution and climate change, you get immediate benefits from less air pollution, better health, long term, more stable climate... So the name of the game here is for one effort, how many benefits can you weave in together? It's the opposite of converging crises.

”

–Dr. Elizabeth Sawin
Co-Founder and Co-Director,
Climate Interactive

4

Embedded Climate Governance

The emergence of automated enforcement

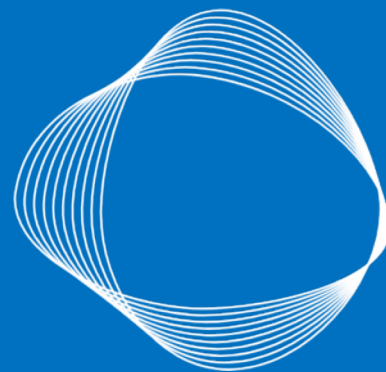
Sensor and surveillance technology embedded in buildings, spaces, environments, and personal items will create a robust information stream. This information will allow governments and organizations to adjust, adapt, and control systems that affect climate to a greater degree than ever before. It will provide carbon markets with essential data and verification that transactions are having the intended impact.

As environmental data becomes increasingly tracked and standardized, it will be combined with automated tools to embed legal enforcement into local sites. Environmental sensor arrays will monitor activity, similar to cameras embedded in red lights that detect violations and trigger automated enforcement mechanisms.

Signal: Climate TRACE automates lifecycle data collection

WHAT: Climate TRACE interprets human input and remote sensing data with AI to identify significant human-caused greenhouse gas (GHG) emissions, and it then traces these emissions back to their original locations and sources.

SO WHAT: This initiative points to a future of large-scale climate sensing and tracking technologies. By identifying the sources of GHG emissions and the responsible parties, decision-makers will have a fuller picture for life-cycle accounting, carbon taxes, etc. This level of sensing and tracking is another essential part of climate governance.

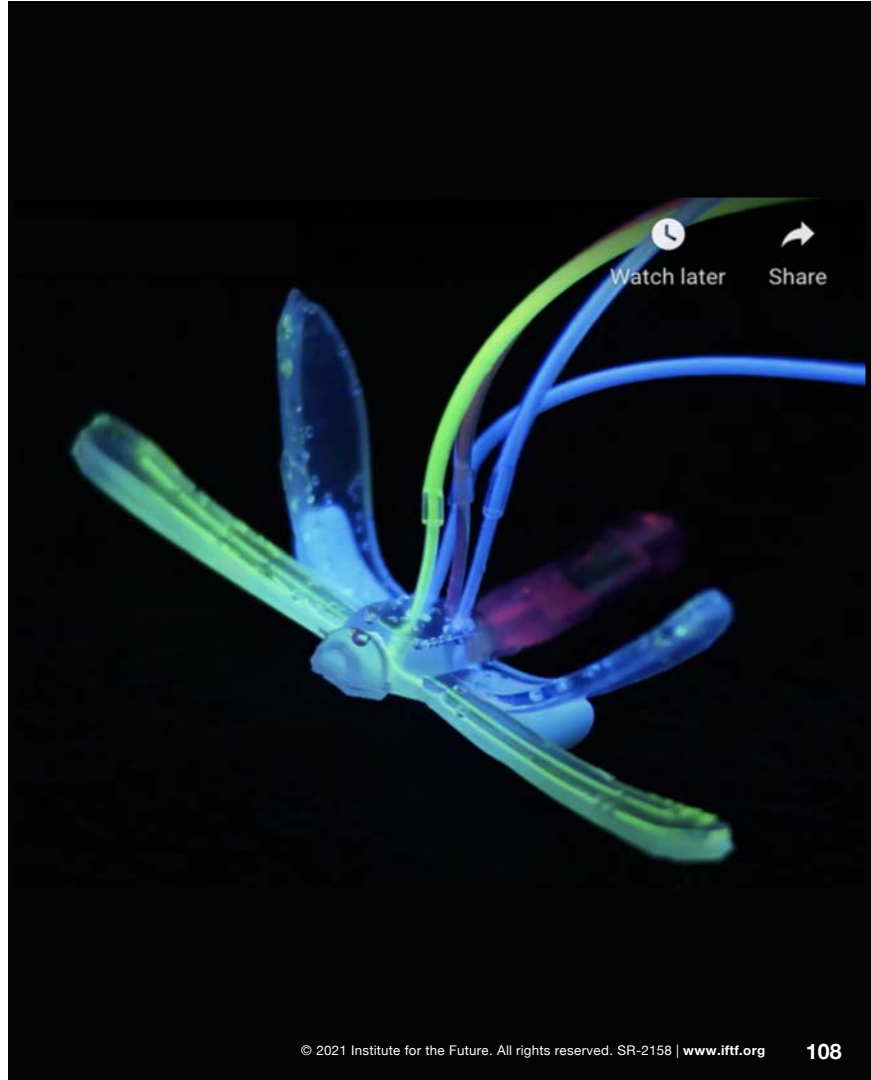


CLIMATE
TRACE

Signal: Dragonfly soft robots skim water to sense changes

WHAT: Embedding climate law enforcement into the physical world will demand technical solutions to measure and manage what happens in places that are hard for humans to reach. Soft robots are versatile tools for sensing and reacting to a wide range of environmental changes. A team of Duke researchers have created DraBot, a hydrogel-coated soft robot that can skim water surfaces and detect changes in pH, or the presence of oil or other contaminants.

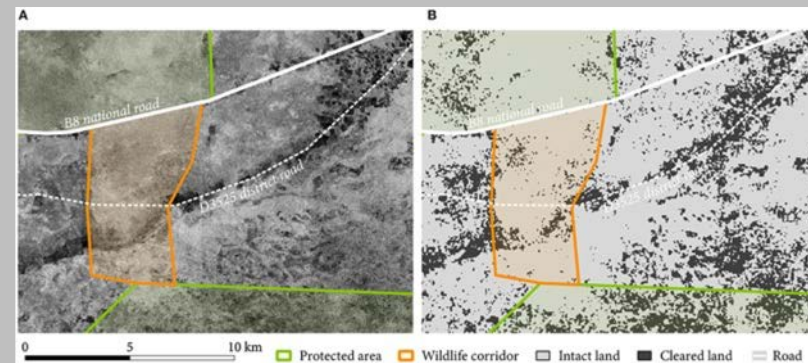
SO WHAT: Environmental sensing robots are becoming cheap and reliable enough to track human impact on vulnerable environments more precisely.



Signal: Smart contracts for environmental governance

WHAT: As environmental governance incorporates payments for ecosystem services (PES) as a mechanism of management, blockchain-based smart contracts may play a key role in ensuring property rights are registered and transactions are transparent and trackable. They can also decentralize the dominant command-and-control models.

SO WHAT: Combining satellite imagery for land use monitoring with reliable mechanisms for governing PES will expand the reach of this method of environmental management. Organizations can use these mechanisms to monitor environments, ensure proper payments of wildlife credits, respect ownership rights, and enforce contract terms.





“Think globally, act locally” is no longer enough: Climate-positive organizations must find leverage points in larger systems (lobbying policy-makers, supporting public initiatives) in addition to organization-level actions (carbon-reducing strategies, waste-reduction, climate-positive investing, etc.).

A power vacuum leaves opportunities to lead: The lack of global coordination and leadership from governments has opened the door for new creative grassroots governance from citizens, local officials, and business leaders. While it may feel chaotic or burdensome, the shifting tide can be an opportunity for new leaders in the transition to a sustainable future.

insights (cont.)



Prepare for new forms of backlash: Progress on climate policy has traditionally seen hostility from deniers and delayers. Now, a new political ideology is entering the mix, which includes violent extremists (like the El Paso shooter and recent New Zealand attacks) who incorporate xenophobia and anti-immigration views into their anti-environmental efforts. This new brand of “climate reactionary” will complicate the narrative around climate response, and potential partnerships must be carefully vetted.

Scientific wonders, social blunders: COVID-19 made clear that in many places around the world, profound scientific progress is undermined by poor social and political progress. This gap between scientific capacity for solutions and social deficiencies in reaping the collective benefit of those solutions will be a major challenge in the coming decade.

insights (cont.)



Making commitments disaster-proof: Economic uncertainty and unexpected crises could derail climate action plans. Setting long-term commitments and expectations among corporate governors, shareholders, employees, and other stakeholders will help plans weather unexpected storms. With demographic challenges ahead, climate-positive organizations must invest in systematic foresight.

Multiple approaches may be needed: Climate positivity will come in various shapes and sizes, with climate responses reflecting organizational values. Will techno-solutionist approaches that maintain the current system's structure and dynamics be more effective and more appealing? Will a more fundamental systematic transformation be necessary? These approaches, and the values embedded in them, will shape the debate and the responses.



VANTAGE



2021–2031 Map of the Decade:
Building Climate-Positive
Organizations 4 of 4

social

Navigating the social impacts
of the climate crisis:
Strategies for
post-traumatic growth

Vanessa Mason
Research Director
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INSTITUTE FOR THE FUTURE

Setting the Stage for Social Transformation:

Preparing for the Emotional Trauma of the Climate Crisis

When people in everyday conversation talk about trauma, they usually mean any exceptionally damaging physical or emotional injury. But under the “meaning-making model” framework in psychology, trauma is understood as something more specific: a disruption in people’s core belief systems and how they make sense and meaning out of the events they perceive and experience.

As the climate crisis intensifies, record wildfires, storms, and rising sea levels will cause damage to physical infrastructure, create economic costs, and disrupt many of our social systems. Organizations will need to work through frequent disruption to human life, make sense of emotional aftermath, and move forward with care in the face of climate-driven trauma.

Setting the Stage for Social Transformation:

Preparing for the Emotional Trauma of the Climate Crisis (cont.)

Psychologists have been exploring how individuals can grow in the aftermath of trauma for years. Richard Tedeschi, a professor emeritus of psychology at the University of North Carolina at Charlotte, has researched and written about the topic extensively. He's identified five ways to facilitate post-traumatic growth: education, emotional regulation, disclosure, narrative development, and service. His work is part of a larger project emerging from the social sciences to understand and strengthen the hidden factors that produce stronger social connections, emotionally healthier populations, and resilience in the face of other challenges.

Over the next decade, as we look toward a future filled with climate-induced trauma as our new normal, organizations will need to support post-traumatic growth to attract and retain workers and customers, to form effective partnerships with industry peers, governments, and communities, and find news sources of meaning to become genuinely climate-positive.

Understanding connections between climate and mental health

Although the potential psychological impacts of climate change are still unfolding, what psychologists have learned so far is daunting. “Extreme heat has been shown to increase mood and behavioral disorders amongst people with pre-existing mental illness and the elderly who have poor thermoregulation,” note researchers Katie Hayes and Blake Poland in a 2018 review article in the *International Journal of Environmental Research and Public Health*. “Extreme weather events, like flooding, hurricanes, and wildfires have been linked to depression, anxiety, post-traumatic stress disorder (PTSD), suicidal ideation, substance abuse, vicarious trauma, loss of identity, and a loss of a sense of place, relationship strain, and helplessness.”

Not surprisingly, mental health concerns about the climate crisis are particularly acute among younger people. A recent small survey of British mental health providers found that more than half of child and adolescent psychiatrists had seen patients who were “distressed about environmental and ecological issues.”



VANTAGE

Int J Environ Res Public Health. 2018 Sep; 15(9): 1806.
Published online 2018 Aug 22. doi: 10.3390/ijerph15091806

PMCID: PMC6164893
PMID: 30131478

Addressing Mental Health in a Changing Climate: Incorporating Mental Health Indicators into Climate Change and Health Vulnerability and Adaptation Assessments

Katie Hayes* and Blake Poland

• Author information • Article notes • Copyright and License information [Disclaimer](#)

This article has been cited by other articles in PMC.

Half of child psychiatrists surveyed say patients have environment anxiety

Research finds young people in England feel growing distress about the future of the planet



▲ Young people are growing up with a backdrop of fear and worry about the planet's future. Photograph: Paul Quayle/Alamy

Loneliness epidemic highlights compounding social challenges

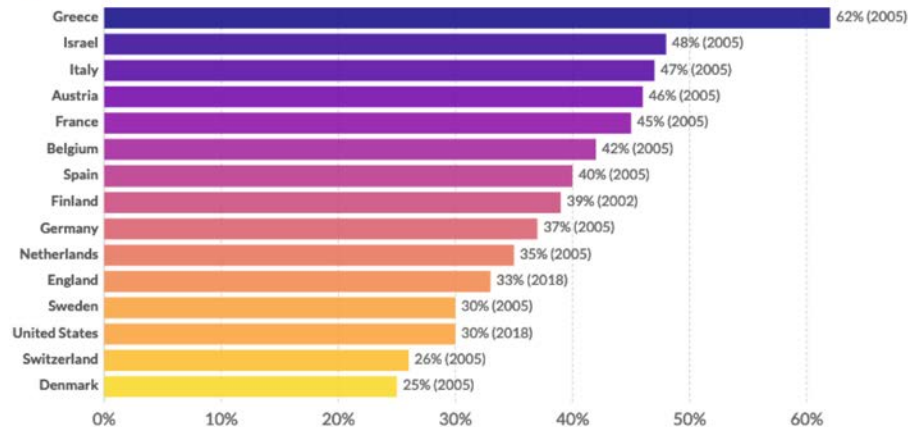
The emotional challenges of the climate crisis will hit as societies worldwide grapple with social and emotional health challenges. In particular, the loneliness epidemic will worsen globally and across generations and countries. Younger people generally report more loneliness than older people. Men typically report more loneliness than women. Countries with more individualistic cultures tend to report more loneliness than those with more collectivist cultures.

Self-reported loneliness among older adults

Share of survey respondents who report feeling lonely at least some of the time. For all countries estimates correspond to population ages 65+, except in the following cases: US (ages 72+); UK (ages 65-74); and Finland (ages 75+).

Our World
in Data

+ Add country



Source: Our World in Data based on Sundström et al. (2009), Savikko et al (2005), ONS (2019) and CIGNA (2018)

Note: Estimates correspond to people who report feeling lonely "some of the time", "most of the time", or "almost all the time". This is in contrast to those that report feeling lonely "rarely", "almost none of the time", or "never".

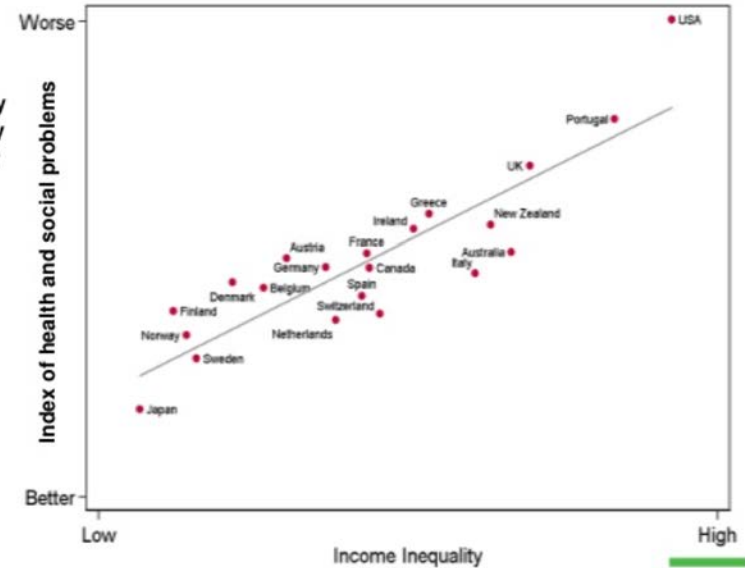
CC BY

Climate crisis in the context of other social failures

Social systems face pressure from other directions, too. Social epidemiologists Kate Pickett and Richard Wilkinson demonstrated pervasive correlations between income inequality and health and social problems. In their newest book, *The Inner Level*, they explore the connections between income inequality and mental health, arguing that stress from living in unequal groups within a society negatively impacts the psychological health of everyone in the society.

Health and social problems are worse in more unequal countries

- Index of:
- Life expectancy
 - Math & Literacy
 - Infant mortality
 - Homicides
 - Imprisonment
 - Teenage births
 - Trust
 - Obesity
 - Mental illness – incl. drug & alcohol addiction
 - Social mobility



Wilkinson & Pickett, *The Spirit Level*

www.equalitytrust.org.uk Equality Trust

Emerging impacts of climate trauma on behavior

The Kaiser Family Foundation and *The Washington Post* surveyed more than 600 Americans ages 13-17 about their behaviors and attitudes related to climate change and found that 24 percent had participated in a school walkout, attended a rally, or contacted a political representative about climate issues in 2019.

In addition to impacting political behavior, climate is affecting family planning decisions. A 2018 survey conducted by SurveyMonkey and *Business Insider* found that 38 percent of 18-29 year-old respondents said climate change should "be a factor" in a couple's decisions about whether to have children.

More than a third of millennials share Rep. Alexandria Ocasio-Cortez's worry about having kids while the threat of climate change looms

Eliza Reisman and Walt Hickey Mar 4, 2019, 3:15 PM



Rise in workplace activism around issues like climate may increase pressure for systemic change

Climate is also shaping behaviors in the workplace. According to a recent survey of 375 global executives by law firm Herbert Smith Freehills LLP, 81% of companies “expect an increase in employee activism, with climate concerns as a top trigger.”

Together, these drivers suggest increasing climate events could push demands for transformational social change past a tipping point, setting the stage for collective post-traumatic growth.

Rise in employee activism



Values are becoming a significant trigger for activism



Four Forecasts

1

Cultivating Emotional Resilience

Facilitating comfort and safety with emotional highs and lows

2

Anticipating Mass Grief

Navigating the loss of community, culture, and commerce

3

Crafting Narratives of Collective Heroism

Imagining climate-positive futures by and for everyone

4

Building Social Ecosystems for Collaboration

Prioritizing and investing in networks of cooperation

Cultivating Emotional Resilience

Facilitating comfort and safety with emotional highs and lows

Over the next decade, people within organizations will experience trauma to varying degrees, making organizational spaces and cultures that promote emotional regulation even more critical. Emotional regulation will be essential for the basic functioning of organizations. It will involve attracting and retaining workers, ensuring they can do their work effectively, and appropriately adapting work practices to external crises. Addressing trauma will also present new opportunities to make workplaces safe spaces to leverage emotion for greater connection, creativity, and purpose.

Organizations can redesign their systems and norms to bring stakeholders' emotions to the

surface in healthy and beneficial ways. The transmutation of emotionality could create “empathy economy” jobs that foster interactions, spaces, processes, practices, and rituals that help people regulate and leverage emotions. New technologies can help people recognize emotions in themselves and others, creating new avenues for the development of emotional intelligence.

This new emotional ecosystem would motivate individuals to create a shared identity and community in the face of volatility and displacement, both within the workplace and globally.

Signal:

Improving psychological safety for performance and adaptation

WHAT: A two-year study conducted by Google found that the teams with the highest levels of psychological safety performed best across the company.

SO WHAT: As the climate crisis worsens, facilitating psychological safety will help employees manage their feelings of trauma and perform well within their organizations. As Amy Edmondson argues in *The Fearless Organization*, psychological safety enables employees to raise “observations, questions, and ideas” and “can make or break an employee’s ability to contribute, to grow and learn” during extreme environmental changes.



Signal:
Climate cafés act as dedicated spaces to express emotions about climate change

WHAT: The Climate Psychology Alliance hosted “climate cafés,” designed as safe spaces for people to express climate anxiety during London Climate Action Week 2020.

SO WHAT: Creating new rituals and dedicated spaces for climate emotions will be vital for building emotional resilience in the years ahead as we learn how to process grief and provide relief to each other.



Signal:
**The new fight for equity:
expression of climate
emotions**

WHAT: After publishing her book *A Field Guide to Climate Anxiety*, author Sarah Jaquette Ray noted that the majority of readers expressing climate anxiety were white. Ray likened the phenomenon to white fragility expressed in issues of racial injustice.

SO WHAT: Climate-positive organizations will need to foster safe spaces that allow everyone to express the full range of emotional reactions to climate trauma to support climate justice and avoid replicating systemic oppression.



Signal:

Finnish researcher calls for climate emotional vocabulary to foster emotional resilience

WHAT: Panu Pihkala is a Finnish researcher who studies climate grief and eco-anxiety. His most recent book calls for developing vocabulary to name “ecological emotions” and “climate emotions” and collectively relearn grieving skills to foster greater emotional resilience in the climate crisis.

SO WHAT: The new literacies of the climate emergency will aid in coping with constant crisis and will form the backbone for interventions like crisis training. These literacies will help build the capacity to respond in effective, healthy ways.



Anticipating Mass Grief

Navigating the loss of community, culture, and commerce

Substantial work has been done in recent years to reframe climate change from a scary threat that requires arduous sacrifice and austerity to an opportunity for innovation that promotes job creation and reduces energy costs. While this shift has helped motivate action in many sectors, what sometimes gets lost in the conversation is that climate change will inevitably lead to significant loss and sacrifice.

Over the next decade, organizations will need to be nimble in response to climate change. That will often require abandoning aspects of their operations that are not climate positive, relocating climate-vulnerable facilities, and taking other disruptive measures. However, there will be

opportunities to do this in ways that prevent, reduce, or at least acknowledge the trauma of those impacted. This will allow organizations to make considered decisions in advance about how to support them and, more generally, what must be protected and preserved in these transitions.

This extends outside of organizational boundaries, too. Even organizations that will be relatively unimpacted, or do not have to go through transitions themselves, can support or drive transition efforts that impact humanity collectively.

Signal: Normalizing organizational closures as growth

WHAT: Focused on the lifecycle of nonprofit organizations, this project aims to develop infrastructure that enables purposeful, compassionate, and smart endings to organizations. This infrastructure preserves the dignity of employees, communities, and stakeholders.

SO WHAT: Climate positivity will require the absence of some organizations and industries unable or unwilling to transform. Frameworks and principles that make endings clear and expected minimize trauma and help uncover meaning amid major change.

Sensing an ending

A toolkit for nonprofit leaders to help decide, design and deliver better organisational endings.

Powered by **Stewarding Loss** - An infrastructure for organisational endings.

Staying close to loss

A set of tools for tending to organisational cultures so loss is explored as part of life.

Powered by **Stewarding Loss** - An infrastructure for organisational endings.

Signal:
**Grappling with loss of
cultural identity and
climate-positive
transition**

WHAT: Transitioning away from fossil fuels is not simply an economic decision, but one that challenges notions of state and national pride. For instance, Mexico's government has backed away from renewables in pursuit of coal and oil projects that "are rooted less in climate change denialism and more in nationalism and nostalgia."

SO WHAT: This signal is a reminder that industries can provide a shared sense of purpose for a community. Understanding and acknowledging these dynamics, whether within an organization or across an industry, will be critical to facilitating transition.

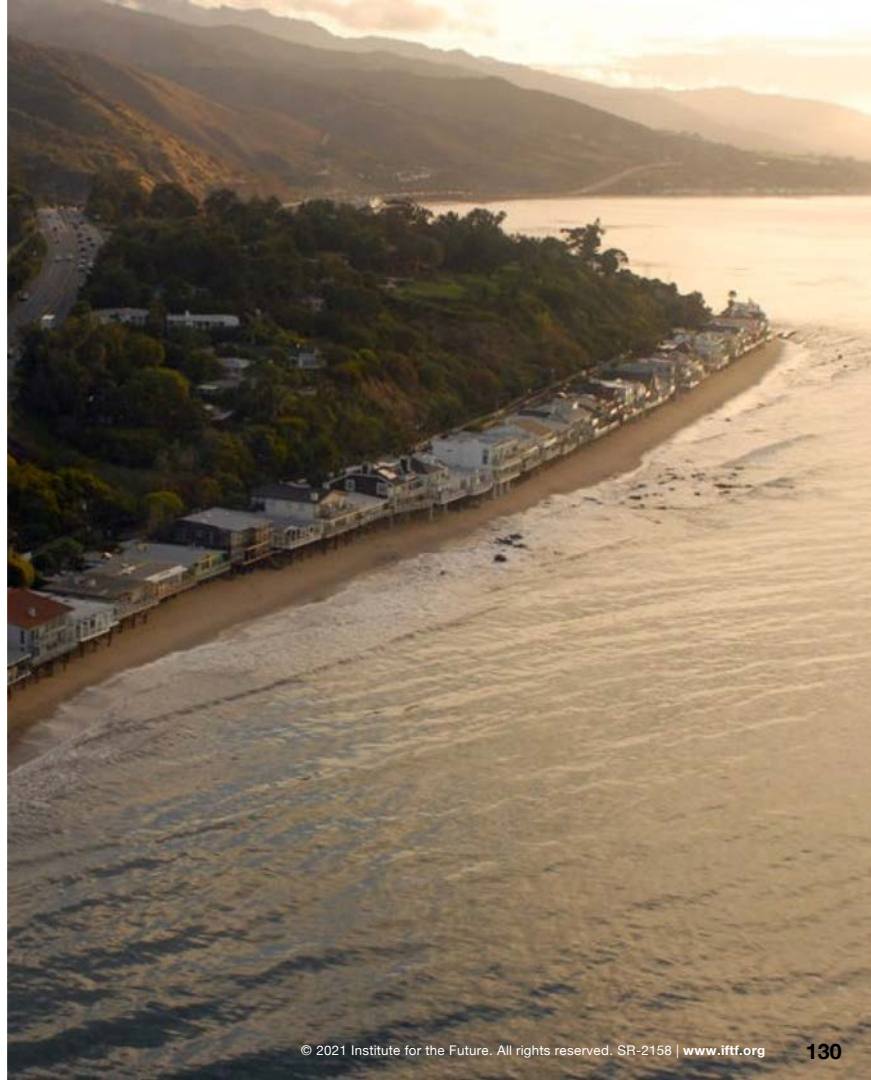


Signal:

California's "buy, rent, retreat" approach aims to secure community acceptance of transition in advance

WHAT: California State Senator Ben Allen has proposed state legislation for a revolving loan program that would buy coastal properties at risk for sea level rise, rent them out, and use the proceeds to pay for the loan and additional costs when the property becomes no longer habitable.

SO WHAT: Managed retreat has existed for decades. It often faces intense pushback from affected communities as well as questions about who benefits and who loses in at-risk ecosystems. Allowing communities and organizations to have some measure of security will enable them to learn and process the more dramatic changes that lie ahead and prepare themselves accordingly.



Signal:

Researchers propose use of new terminology to give dignity to climate-induced migration

WHAT: Rather than terms like “managed retreat,” authors propose alternatives like “community-led relocation” that center the needs, knowledge, and lived experiences of people and acknowledge the interconnectedness of place, relationships, and ways of being.

SO WHAT: A shift in terminology is more than semantics. Climate-positive organizations will need to consider more holistic perspectives that account for physical, social, and cultural infrastructure to minimize losses and address long-standing inequities and injustices to make trauma-informed transitions.



Crafting Narratives of Collective Heroism

Imagining climate-positive futures by and for everyone

Trauma is a rupture in the narratives we use to make sense of the world. Therefore, it should come as no surprise that one of the most significant benefits of post-traumatic growth is that it provides the opportunity to create new and better narratives. In Tedeschi's framework, facilitating post-traumatic growth through "narrative development" means creating new narratives to make sense of the trauma and reimagine the future. This directly applies to the climate crisis.

As highlighted in the introduction to this section, climate change is increasingly the source of fear- and anxiety-based narratives. Likewise, rapid economic transitions can create the impression—fairly or not—that organizations focused on

creating new kinds of futures are doing so by disrespecting the past and present.

While narratives often form in emergent, organic ways, they can also be crafted deliberately. Just as mental health practices help people intentionally create empowering narratives of themselves as individuals, new efforts are emerging to do the same at a collective level. Over the next decade, climate-positive organizations have the opportunity to facilitate post-traumatic growth by embracing, not resisting, these new narratives, and by empowering their stakeholders to participate in creating their own.

Signal:

Academic initiative explores narratives of societies after fossil fuel

WHAT: Climaginaries is a group of academic researchers at European universities collaborating to develop novel imaginaries and narratives of a world without fossil fuels to expand pathways to transformation and accelerate the transition.

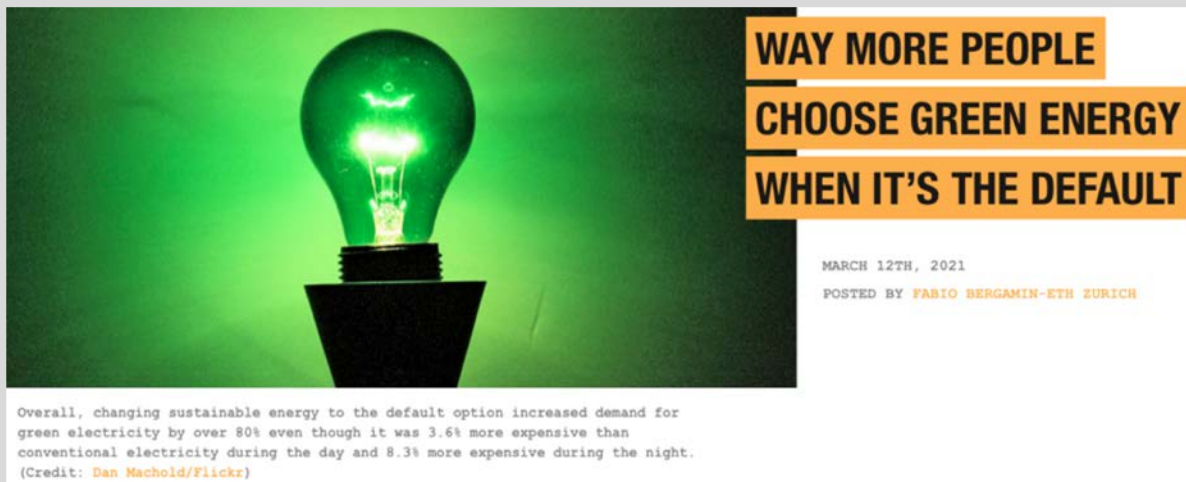
SO WHAT: In many ways, our inability to imagine a world free of the causes of climate change limits our capacity for action. Collaborations like Climaginaries catalyze innovation, increase buy-in for both shared sacrifice and benefit, and reward values and behaviors that accelerate the transition to climate positivity.



Signal:
**Hidden defaults increase
mass climate-positive
behavior**

WHAT: Researchers recently examined the energy purchasing decisions of more than 200,000 households. When slightly more expensive green energy was opt-in, the researchers found that approximately 3 percent chose to pay more. When green energy was the default, more than 85 percent opted for it despite the added cost.

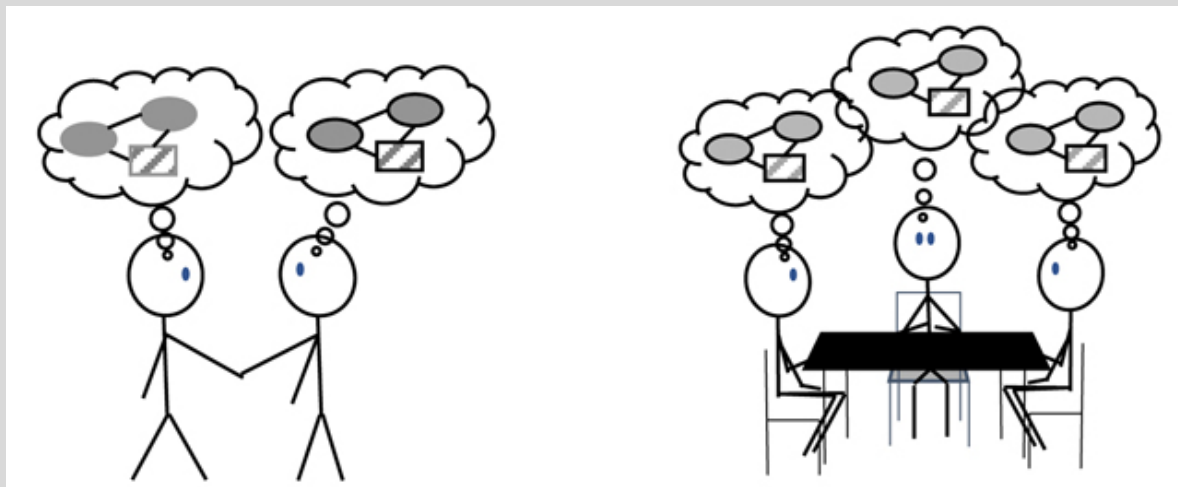
SO WHAT: In the book *This Could Be Our Future*, author Yancey Strickler argues, “By setting the context, hidden defaults make decisions for us... Not only do we perceive hidden defaults as how things are, we see them as how they *should be*.” These collective behavior changes can significantly shift social norms for good.



Signal:
Climate fiction makes sharing beliefs, collective decision-making for green transformation more accessible

WHAT: A researcher outlined a [conceptual framework](#) to understand the cognitive and social effects of climate fiction on socio-climatic imaginaries, individual imagination, and collective imagining, as well as their impacts on social and political decision-making.

SO WHAT: Narratives from popular climate fiction can challenge, create, and/or change collective ideas and beliefs by engaging dialogue to create visions of the future. This is a source of power that organizations must cultivate to enable large-scale transformation.



Signal:
**Care work is vital for a
green society and
economy**

WHAT: The Leap is collaborating with the care sector including nursing, teaching, and home care to build a worker-led movement aligning care work with a green transformation of the economy and society.

SO WHAT: Just as there is a drive to practice stewardship of natural resources for building climate positivity, The Leap's movement underlines the need for organizations to steward human resources through care work for a healthier planet.

Care Work Is Essential Work
IT'S ALSO CLIMATE WORK

Building Social Ecosystems for Collaboration

Prioritizing and investing in networks of cooperation

Climate events over the next decade will be experienced collectively, at least on a local level. In many cases, people will find meaning and purpose by joining communities of shared experience. As argued in *A Paradise Built in Hell*, an accounting of post-disaster human behavior in the wake of events like the San Francisco earthquake of 1906, catastrophe does not necessarily bring out the worst in people. It often provokes altruism and a renewed sense of purpose. But this sense of altruism can quickly be quashed if event survivors start to expect the worst of each other.

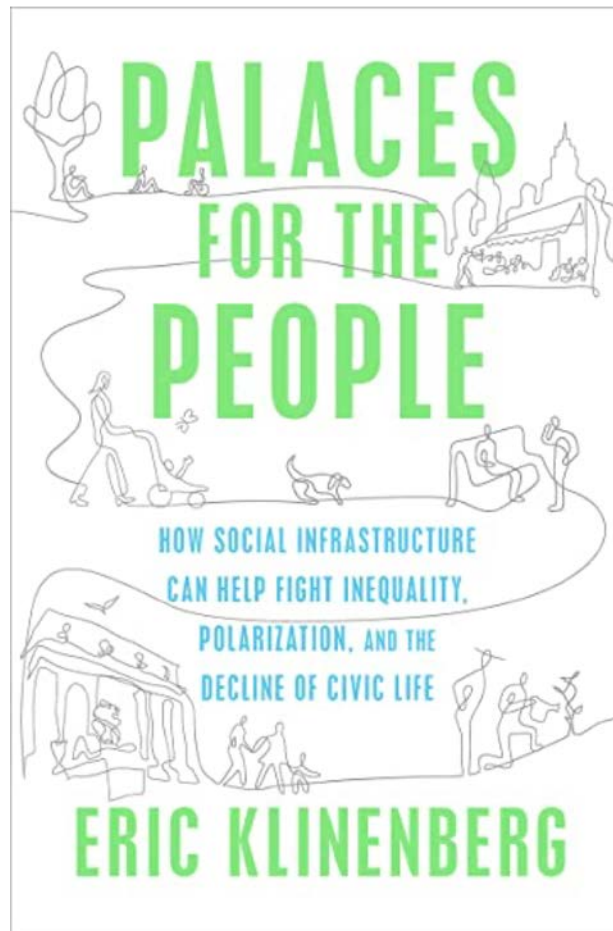
In recent years, a growing body of social science research uncovering the underlying conditions that enable individuals, communities, and organizations to cooperate in the face of hardship. For organizations, the real opportunity for post-traumatic growth is to tap into this dynamic and embrace a more radical approach to openness and collaboration. Enabling more openness and collaboration will help organizations at multiple scales, from empowering individuals facing the personal impacts of environmental events to facilitating larger collaborations between organizations.

Signal:

Measuring factors that produce better social outcomes

WHAT: In 1995, Chicago was devastated by a heatwave that killed 739 people in less than a week, primarily killing poor, African American, and Latino citizens. In the aftermath of the heatwave, sociologist Eric Klinenberg sought to understand why some communities, despite high poverty levels and other risk factors, managed to avoid high mortality and found that “social infrastructure” is a critical determinant in the success of neighborhoods in the face of a disaster. Similar research following Hurricane Sandy found social factors in neighborhoods helped determine the immediate impacts of the storm and long-term outcomes following the event.

SO WHAT: Klinenberg defines the concept of social infrastructure as the kinds of third spaces and interventions—from libraries to coffee shops to strategic tree planting in urban areas—that are likely to produce better social outcomes. As these kinds of findings emerge, they point toward potentially hidden leverage to invest in everything from facilities design to employee wellness efforts.



Signal: The "constitute" as a transitional alternative to the "organization"

WHAT: Pat Kane of *The Alternative UK* coined the concept of a “constitute” to describe emergent structures that are co-created by community and civil society to handle complex challenges via self-determination.

SO WHAT: Hybrid models can inform how traditional organizations and institutions can live in a transition period before fully embracing more transformational organizational structures.

The image shows two side-by-side definitions of the word "constitute". The left side is a screenshot of a standard dictionary entry, and the right side is a definition created by Pat Kane.

Left Side (Dictionary Entry):

constitute [kon-sti-toot, -tyoot] [SHOW IPA](#)

[SEE SYNONYMS FOR constitute ON THESAURUS.COM](#)

verb (used with object), **con-sti-tut-ed**, **con-sti-tut-ing**.

- 1 to compose; form:
mortar constituted of lime and sand.
- 2 to appoint to an office or function; make or create:
He was constituted treasurer.
- 3 to establish (laws, an institution, etc.).
- 4 to give legal form to (an assembly, court, etc.).
- 5 to create or be tantamount to:
Imports constitute a challenge to local goods.
- 6 Archaic: to set or place.

Right Side (Pat Kane's Definition):

constitute [kon-sti-toot, '-tyoot]

Noun
A composition, a forming
The constitute was assembled to gather together the forces and assets of the community

The making and creating of leadership functions by a community
It was decided by the constitute that she would liaise with the people from the solar energy grid

A flexible social structure that connects community purpose with infrastructural and productive technologies
The local food system, linked up to a currency-making blockchain, was convened and coordinated by the constitute

Signal: Facilitating conditions for competitors to collaborate

WHAT: [The NextGen Consortium](#) includes corporate and nonprofit partners in the food and beverage industry. They collaborate to design and develop products that contribute to sustainable supply chains and reduce single-use food packaging waste. These could not be produced in competition with each other.

SO WHAT: Collaborative approaches like co-op-petition allow organizations to pursue goals that achieve outcomes much larger than any singular organization could. This will require more decentralized, open networks for information and resource sharing.



Packaging Innovation

Identifying and sourcing sustainable material innovation



Share Image

Reuse & Refill Models

Keeping packaging materials in play for multiple uses



Materials Recovery and Recycling

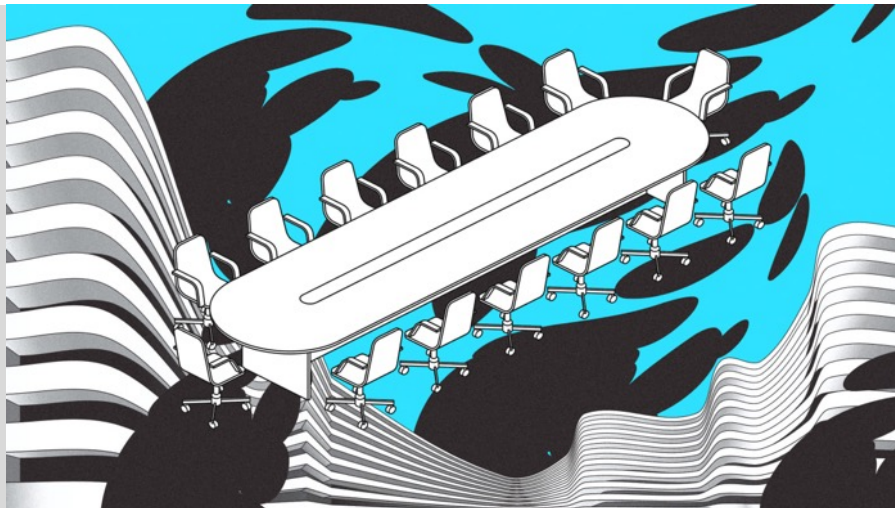
Aligning packaging with recovery infrastructure



Signal:
New model of corporate climate leadership emphasizes collaboration

WHAT: The Drawdown Review calls for a new model of corporate climate leadership that emphasizes “accelerators”: ambitious goal-setting beyond emissions; employee and customer activation; systems-level strategy; and using corporate influence to advocate for climate-positive policies.

SO WHAT: The enormity and complexity of climate change requires more networked and distributed models of leadership that move away from the “command and control” structure of hierarchy and bureaucracy to achieve impact rapidly at scale.





The changes will be staggering, so look for ways to leapfrog:

Planning strategies and adapting systems not to the current wave of change but to the next one on the horizon isn't easy, but keeping the big picture in mind—the need to get to zero carbon emissions—can help avoid being caught up in momentary controversies.

This is big: It's difficult to overstate just how world-changing both the challenges and the needed changes are. It's more than any one organization can control. Look for ways to cooperate and partner with other organizations, and keep an eye out for groups well outside your issue or industry with parallel concerns.

Make the invisible visible: Steering in this time of acceleration requires the capacity to see ahead – but also to see around you. You can't reliably influence or improve what you can't identify. Track everything, and keep that data. Information that might seem useless now can become sources of insight, inspiration, or even revenue in the years to come.

insights (cont.)



Don't be afraid to be afraid: The immensity of the climate emergency is beyond anything modern humans have ever dealt with. Being climate-positive doesn't mean being willfully blind to the scale of the problem.

Multi-solving and polymorphic thinking: The most powerful solutions and ideas will come from looking for ways to grapple with multiple problems simultaneously, and from being willing to reshape the organization to meet the needs of an entirely new world.

Look for ways to turn your footprint into a handprint: Every living entity, and every system we create, leaves a mark on the world. The climate footprint marks a path of taking more from the planet than we give. A handprint, conversely, signifies doing what we can to improve the survivability and resilience of the world in which we live. What can your organization do to give both the planet and the people it holds a better future?

Toward Climate- Positive Organizations: Overcoming the Information- Action Gap



The climate crisis will demand that organizations set ambitious, long-term goals—and begin acting on those goals today. To help you take action within your organization, IFTF Vantage has developed a toolkit process for you and your team to leverage as a companion to the 2021–2031 Map of the Decade, *Building Climate-Positive Organizations*.

The companion toolkit materials include:

- **Future Visions of climate-positive organizations** bring the opportunities for transformation to life by providing six scenarios of emerging kinds of climate-positive organizations.
- **Blueprint for action** offers a guided process for using backcasting with your team to create a roadmap for transformation within your organization, working back from future transformation to actions that you can begin implementing today.

You can find these materials at **vantage.iftf.org**.

What's Next: A Decade of Transitions and Transformation

In the second half of the year we're exploring what's next in the New Operating Environment, diving into the changing realities of the collaboration, security, belonging, ownership, evidence, justice, and meaning-making that define our work and personal lives. To ground future foresight in present-day action, we offer an ongoing calendar of capacity-building activities, including facilitated online workshops and events, action-oriented toolkits, and Vantage's foresight-focused digital platforms like Future Factors.

Vantage Point is the digital hub for IFTF Vantage partners, featuring research curated specifically for your organization, online foresight discussions, and regular digital events.

Future Factors is IFTF's proprietary, easy-to-use platform for sharing and synthesizing the signals from today that will underpin the transformation of tomorrow.

About



Institute for the Future (IFF) is the world's leading futures organization. Its signature program, IFTF Vantage, is a unique partnership of innovative global leaders that harnesses over 50 years of IFTF global forecasts and pioneering research to navigate volatility, identify emerging imperatives and opportunities, and develop world-ready strategies. IFTF Vantage partners represent businesses, governments, and social impact organizations from around the world that require the most comprehensive view of future forces directly affecting their organizations. To learn more about how IFTF Vantage generates organizational readiness for a world in flux, visit www.iftf.org/vantage.

Do you have questions about your IFTF Vantage partnership?

Please reach out to Sean Ness at sness@iftf.org.