Future Forces That will Disrupt Sustainable Business

a full-spectrum thinking approach to building sustainability, 2019–2029
Future Forces That Will Disrupt Sustainable Business

examines the challenge of doing business in a rapidly changing world, where the definition of ‘sustainability’ is broadening and every business wants to build and maintain a ‘sustainable’ business model.

This report examines four future forces that are external drivers of change with the power to upend today’s business models over the coming ten years. We ask readers to grapple with these forces and to consider how each might disrupt their organization—as well as open up new opportunities. They are meant to provoke new conversations outside of today’s traditional sustainability considerations.

To help you navigate this increasingly complex business planning environment, we introduce you to a full-spectrum thinking approach to building sustainability as well as tools to help draw your own foresight—whether you agree with the forecast or not.

This report is the output of a 2019 project supported by the members of GEMI, the Global Environmental Management Initiative. It follows a forecast GEMI commissioned from Institute for the Future in 2007. We encourage you to visit that forecast to see how the ecosystem of sustainability has evolved over the past decade.
What to look for in this forecast

• **Dive in** to understand the future forces. Be sure to view and/or print this library, with notes included that explain the slides in full detail.

• **Get comfortable** with the concept of full-spectrum thinking to help you move from looking for the right answer to today’s challenges and instead unlock a range of possible answers that each bring value.

• **Learn to communicate** the four future forces in your own words, and explain how they will have new impact on your organization’s sustainability efforts, as well as those of your customers and suppliers, over the coming ten-plus years.

• **Scout for additional signals** of change that bring to life the impacts these forces may have on your organization.

• **Draw out your own insights**, using the tools we suggest here or your own tools of analysis.

• **Develop a community** of people to help you think systematically and imaginatively about the future.
The Foresight-to-Insight-to-Action Cycle

IFTF brings expertise in foresight: looking to the future through a systematic, plausible, and provocative lens. Foresight is not prediction.

Insight arises out of foresight. It is the “a-ha” moment that signifies a new way of looking at the world. Critically, once you’ve had an insight, you can’t go back to your old way of thinking.

None of this matters without Action. As an organization, you must decide how to take action based on your newfound insights.

Finally, this process is a cycle, since any action leads to new developments to assess through foresight.
Addressing future forces disrupting sustainable business

In 1987, the United Nations gave a modern definition to the concept of ‘sustainability’ with the publication of Our Common Future. This report challenged all countries to ensure that their development efforts “meet the needs of the present without compromising the ability of future generations to meet their own needs.” Similarly, businesses with an eye towards sustainability strive to develop their present capacities while preparing for their futures.

Historically, companies around the world have operated with a centralized business model that aims for efficiency and scale. Intellectual property is a key asset. Planning cycles are faithfully followed, and bonus pools for hitting KPIs are the norm. Businesses and markets are commonly siloed into categories, and improvement is attributed to work effort and market timing.
Shifting to Full-Spectrum Thinking

Yet categorization often leads to a false sense of understanding of the world and the forces that shape our decisions.

In his 2020 book, IFTF’s Bob Johansen forecasts the need for a new skill: spectrum thinking. He writes, “Full-spectrum thinking is the ability to seek clarity and understanding across a continuum of possibilities—while resisting the temptations of premature categorization and false certainty.”
In the future, business leaders will have to grow more comfortable with uncertainty. Understanding multiple, possibly divergent, implications and acting on them with clarity will be the norm. This may mean leaving some things undecided while still working towards a goal or outcome—holding on to those goals lightly. Letting go of a sense of right and wrong paths will be foundational.

This is the heart of strategic foresight: opening your mind to hold competing possibilities as equally valid, likely, and worth pursuing. New spectrums—not just one spectrum—of thought will become possible in new ways over the next decade. **Full-spectrum thinking will be required to thrive.**
Fortunately, new spectrums of innovation are beginning to appear already. Full-spectrum thinking is on its way to becoming the norm.

This deck introduces a few of the new spectrums that will become important and scale up over the next decade and challenge companies as they strive to meet their sustainability goals. It will be a great time to leapfrog past incremental and categorical innovation, and full-spectrum thinking will help us do just that in the realm of sustainability as well as all business planning.
The spectrums include several signals of change, a key tool of futures thinking. These signals aren’t predictions or endorsements, but rather real, current-day examples of deviations from the norm that, if they were to scale up, would typify the way that these futures might come to look.

Integrating signals allows planning to be based on instances of what already exists today, and not conjecture or opinion.

When you read a signal, it’s often useful to take each one as a micro thought-experiment: ask yourself, “What might change about the way the world works (or the way my industry, my organization, or my life works) if this signal were to scale up?”
Taken together, these forces suggest that over the next decade, businesses that genuinely prioritize new approaches to sustainability will be rewarded—and those that treat it as an optional activity will lose out.
Businesses will operate in a world of distributed ecosystems

**NEW SPECTRUMS OF value creation**
Businesses will operate in a world of distributed ecosystems

**NEW SPECTRUMS OF resources**
Materials and infrastructure will evolve through deep technology

**NEW SPECTRUMS OF meaning**
Full-spectrum natives will lead shifts toward more inclusive, diverse, and unusual values

**NEW SPECTRUMS OF time**
Organizations will adapt to future back-strategy to navigate competing pressures
NEW SPECTRUMS OF
resources

In 2008, for the first time ever, more people worldwide lived in cities than rural areas; by 2050, the U.N. anticipates 70 percent of the world’s population will be in cities.

Accommodating this growth will require building as much new building stock as is currently in all of New York City—per month. Mass urbanization, human movement and longevity, infrastructure upgrades: these are all factors that are contributing to growing demands for meat, water, construction materials, pharmaceuticals, and more.

Image: Shanghai 1992 and 2012
This tipping-point effect is replicated in renewables just as much as in traditional resources. McKinsey’s 2019 Global Energy Perspective reports that “by 2030, new-build renewables will outcompete existing fossil fuel generation on energy cost in most countries – one of the key tipping points in the energy transition.”

But while this growing demand is opening up new kinds of global business opportunities, we should not assume that this growth will mirror the ways we’ve deployed resources and infrastructure in the past.
NEW SPECTRUMS OF resources

A range of novel materials will make up this spectrum that forward-looking organizations can harness to reinvent the ways we develop, distribute, and manage physical infrastructure and goods.

Spectrum thinking, in this case, means understanding that the values and advantages of inputs will shift rapidly, while providing new solutions to thorny resource problems.

An early success at growing beef in the lab. The cost of this petri-dish-sized portion was orders of magnitude higher than it is today.
Signal

Bolt grows their leather in the lab, eliminating the dirtiest production step in the supply chain

**What:** Bolt Threads is using bioengineering to grow natural materials under lab conditions.

**So What:** Differentiations between lab-grown and non-lab-grown materials will become an important factor in manufacturing. While the past couple of decades saw a backlash against “GMOs,” new materials - which technically may be the product of genetic engineering – will be seen as responsible and sustainable, rather than frightening or irresponsible.

What’s Next?

Biomimicry engineering will become an on-demand service, with students and independent scientists banding together to respond to RFEM’s: Requests for Engineered Materials.
**Signal**

**Big Pharma contracts AI discovery of drugs, ushering in an era of AI-driven optimization**

**What**: Pharmaceutical company Eli Lilly & Company has offered Atomwise, an AI-based drug discovery company, $1 million per discovery of molecules addressing certain disease targets.

**So What**: Complex technologies like AI that are required to navigate cutting-edge R&D advancements will operate as B2B services for companies who can’t take on the risk or burden of doing it themselves. As AI services become the norm for advancing R&D, it will aid in discovering the most optimally-sustainable materials and processes for *all* types of businesses.

**What’s Next?**

Quantum computing, powerful simulations, and advanced 3D printing will upturn innovation methods at a speed that quickly outpaces traditional labs and regulation. The most effective, sustainable, healthiest, and efficient products will be the result of these discovery methods.
The rise of ultra-strong, carbon-sequestering wooden skyscrapers is enabled by combinatorial factors

**What:** Plans for massive wooden buildings are enabled only by the favorable combination of government initiative to promote wooden buildings, a breakthrough in digital design tools, and cutting-edge chemistry.

**So What:** The next decade-plus of resource advancements will be heavily influenced by too many interacting factors to have a strong grasp on each. Putting a new sustainable material into use will require broad collaboration.

**What’s Next?**

A spectrum of building materials and techniques—nanocrystalline cellulose, warping simulations, green concrete, and more—are waiting in the wings and may become “overnight successes”.
Ginkgo Bioworks grows custom molecules to order, moving production into tightly-controlled, low-input systems.

**What:** Ginkgo Bioworks designs organisms capable of producing cultured ingredients for use in agricultural processing and food ingredient industries. This drastically reduces the type of inputs and outputs required to create a molecule.

**So What:** Ginkgo and similar companies will give us access to a wide array of novel inputs with limitless customization possibilities. This process can lessen the climate impact of business by limiting the scope of inputs required – the microorganisms that grow their products essentially only need sugar and energy to "operate."

**What’s Next?**

A cell-programming platform will enable quick pilots to explore new organisms and smart cells as medicines and industrial catalysts, solving previous intractable supply chain issues.
It is daunting to track every possible technological development. Spectrum-thinkers understand that new developments can be rapid game-changers, and so leave themselves the flexibility to shift gears while simultaneously pushing forward with their current initiatives.

In a future of exponential infrastructure and population growth, engaging with this new spectrum of resources requires flexible thinking on where materials come from, what solutions they can provide, and how quickly they can scale or fail.
In many cases, we’ll soon hit an inflection point where sustainably advantaged things will be cheaper to make than their less-sustainable counterparts. There is an early opportunity to invest in sustainability focused R&D now to make these markets yourself, rather than wait around for someone to beat you to it.

Many of the innovations that captured the public eye in the late 1990s through 2010s were focused on consumer software and Internet connectivity. The next few decades will see the rise of sustainable innovation in materials, infrastructure, and related services as the exciting space to pay attention to.
NEW SPECTRUMS OF
resources
Materials and infrastructure will evolve through deep technology

NEW SPECTRUMS OF
value creation
Businesses will operate in a world of distributed ecosystems

NEW SPECTRUMS OF
meaning
Full-spectrum natives will lead shifts toward more inclusive, diverse, and unusual values

NEW SPECTRUMS OF
time
Organizations will adapt to future back-strategy to navigate competing pressures

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A categorical mindset of value creation has typified the way we view the world for the past century or more. In this mindset, a business model is built around delivering a specific product or service.

As it becomes easier to enter markets and harder for consumers to differentiate between products and brands (for example, an Amazon search for a common product can turn up thousands of nearly identical results), new actors will also be empowered to create value in novel ways.
NEW SPECTRUMS OF
value creation

Soon it won’t just be companies that comprise the realm of value creation. Increasingly, individuals, communities, digital communities, and (possibly quite soon) autonomous digital agents are becoming empowered to create value outside traditional networks.

These actors will make up the oncoming spectrum of value creation. Not only will they be organized and operate in a variety of ways, they will bring a spectrum of motivations to their work beyond simple financial gain. Companies that wait to react will lose market position by not being proactive.
Two main drivers of change will influence the growth of this new spectrum of value creation:

1. Distributed network technologies such as blockchain systems will allow any given group of people to organize as effectively as a company to meet a goal.

1. Decentralized generation will be enabled both by emerging technologies for production of necessary goods (mesh networks, solar arrays, AI-powered food production, 3D printing, synthetic biology) and by communities motivated to take control of their own infrastructure and production of products and services.
Blockchain tokenizes a redwood preserve, allowing anyone to fund ecosystem services

What: Artist Jarret Mellenbrunch published a white paper proposing to create a long-term redwood tree preserve that would restore historic redwood populations and act as a carbon sink. The proposal would be funded by a blockchain platform.

So What: Carbon sequestration is a tricky thing for private businesses to profitably address—even if they want to. Blockchain tokenization allows for new types of organizations to arise that operate on the principal of maximizing traditionally non-monetizable or intangible assets, such as carbon sequestration or natural beauty.

What’s Next?

People will start pseudocorporate entities that aren’t driven by shareholder profits, fiduciary duty, or even operating costs. Instead, they will be enabled by distributed technologies that let people effectively commoditize ecosystem services.
Microgrid company offers a spectrum of services in Bangladesh, shifting the business of sustainability into local communities

**What**: SolShare creates plug-and-play microgrid components that allow for individual-level energy trading.

**So What**: SolShare makes money on all phases of the cycle while enabling their customers to be producers as well. They enable their customers to also be producers and agents of sustainable energy generation – a successful but stark contrast from top-down energy utilities.

**What’s Next?**

Value creation will occur at many levels, and there will be fuzzy lines between who is the producer, the consumer, the buyer, the seller, and so forth. This will be seen in services and products alike.
Signal

Orkney Cloud is enabling a small community to take the lead on their cloud services

**What:** The remote Scottish community of Orkney is creating a data-services body distributed over several local organizations.

**So What:** Technology tools that are more accessible and powerful will allow more communities like Orkney to fulfill more of their needs through community-led comprehensive and specialized networks. As more communities are able to do this type of thing, organizations will need to learn how to interact with an array of communities as both customers and value creators.

**What’s Next?**

Communities that need a very specific service fulfilled will build more and more complex infrastructure on their own, reaping the benefits and leaving out traditional infrastructure providers.
Dash cryptocurrency operates as a DAO, signaling the possibility of organizations with operating axioms – like sustainability – hard coded into their structure.

**What:** Dash is a Decentralized Autonomous Organization (DAO), a value-creating group that operates without centralized control. The organization is an open protocol, more akin to e-mail than a company.

**So What:** While they are currently limited to specific domains, a fully-realized concept of a DAO would mean that “self-driving companies” might soon become viable as an organizational structure. These DAOs could be hard-coded to operate in specific ways, with immutable rules baked-in. For example, a DAO created with the rules to operate sustainably would carry out that mandate, even in the absence of human leadership.

**What’s Next?**

In a world of successfully functioning, cross-industry DAOs, entire companies will be guided by…no one in particular, while still achieving a set of pre-defined goals.
Think through the ways these signals of change can help your company find ways to own yet share the creation of value in your market space and sustainability efforts.

Look to high-delta markets (communities that are accustomed to thriving in extremely volatile conditions) as potential blueprints for navigating spectrums of value creation. Value is not just creating products but also services: imagine how to build out a business model of services your company is uniquely qualified to offer.

Imagine that regulation caused you to cease your largest product or service. What new ways would your company generate value? Dismantle the categories you see as producing value within your organization and try to uncover valuable new connections.

Value creation will become a highly diverse process as we witness the increase of distributed networking and generation tools. Track technologies like blockchain, mesh networking, and artificial intelligence closely as an acid test for how large this spectrum of value creation is growing.

The new ways that organizations, their customers and suppliers, and digital agents are creating value will continue to diverge, meaning that it will be difficult to keep a single perspective on all parts of the value-creation ecosystem. Consider that providing services to a community-led distributed utility will be quite different from providing those same services to a fully-automated, decentralized company managed by smart contracts.
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time
Organizations will adapt to future back-strategy to navigate competing pressures

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Present-forward thinking has classically been the default way of strategic operation, and for good reason: it’s intuitive and natural. However, the present is becoming too noisy for present-forward to be the only way to think strategically. Vast amounts of conflicting data, ideas, information—in other words, noise—are rapidly piling up. Simply looking for the next big thing and how to monetize it will no longer keep your business ahead of the curve. Organizations that instead approach strategy through a “now, future, next” framework, by making strategic decisions based on far-horizon futures, are starting to appear—and in some cases starting to pull ahead of the pack.
Increasingly, customers and investors will align with companies that work with future-back models, rather than present-forward.

To get ahead and stay ahead, businesses will switch to a ‘now, future, next’ framework to build both forward-focused and sustainable business plans that are not tied to time constraints. This framework looks at planning very differently and sees long-term thinking as an ally.
The value of long-term thinking is quantified, justifying initiatives that take a long time to return benefits.

**What:** A ten-year study defined Corporate Future Preparedness in 135 major European companies and linked foresight strength to substantially higher profitability and growth.

**So What:** This demonstrates the value of thinking long-term and accepting uncertainty as an approach that helps firms outperform their competitors. This quantitative evidence can empower internal and public decisions to support sustainable initiatives that are short term negatives, yet likely long term net-positives.

**What’s Next?**

New financial rating systems will incorporate future-preparedness metrics and accept business forecasts offering a range of outcomes.
Terracycle leapfrogs to a future recycling system

**What:** TerraCycle’s business model is getting end-users and producers to fund waste diversion research for currently unrecyclable materials. Their new Loop service offers consumers reusable packaging with convenience.

**So What:** By banking on future sustainable markets, TerraCycle is gradually creating viable processes and markets for waste while building an engaged customer base glad to help fund a solution to their lifestyle.

**What’s Next?**

Business leaders will imagine new “end-of-life” product partnerships and drive towards significant future revenue while disposing of their products and byproducts.
Automotive company uses long-term horizons to entice investors and consumers

**What:** Upstart automotive company Tesla posts their 10 year Master Plan on their website, visible to investors and competitors alike, inspiring patient investors and partners for future sustainable products.

**So What:** Demonstrating comfort with toggling between the pressures to maintain a competitive edge long-term and operate within the tight margins of today allows stakeholders to understand the actions of the company today in light of their future vision.

**What’s Next?**

Rather than seen as a limit or impediment to success, long time-spans will instead function as a partner that enables new business models to flourish and be rewarded.
The Long Term Stock Exchange (LTSE) gets SEC regulatory approval

What: Regulators accept less reporting as an acceptable business investment practice, with the establishment of the LTSE. This new exchange will list only companies and investors that focus on long-term growth and innovation.

So What: A 2017 study found that within five years of going public, pressures to meet short-term profit estimates leads to an average 40% decline in patents. The LTSE decreases the power that time holds in business planning, enabling companies to develop their own path to profitability in uncharted sustainability efforts.

What’s Next?

Public companies will work with regulators to find new ways to communicate their earnings and potential without quarterly estimates. Blockchain may provide a validation of corporate earnings without granular data open to inspection.
The advantage of incorporating a future-back strategy is just now becoming clarified and validated through case studies and research. In the next ten years, organizations that can create effective strategies for long-term operation (beyond the career spans of individual people) will be the ones that can weather complex and volatile global systems, and be rewarded with greater long term growth.

Incorporating a clear view of a future ten or twenty years out is easier to do than a future only two or three years out because organizations have a latent capacity to influence those further-out futures more strongly.

Due to the increasingly noisy nature of the present, influencing the future will become a critical capacity. A future-back strategy allows an organization to do this effectively.

Think through the ways these signals of change can inspire your company to address current time-bound challenges and opportunities and shift your strategic planning cycles. What is currently seen as impossible, that might be a rallying vision from the future?

Imagining the future first will cause you to push outside your traditional trust boundaries to open IP, physical assets, and tightly controlled business models to create networks of previously disconnected stakeholders. Simulations will become the norm as they allow massive variable scenarios to be optimized for net-positive environmental and social impact across time-frames.
Materials and infrastructure will evolve through deep technology

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Organizations will adapt to future back-strategy to navigate competing pressures
Political scientists Andrew Gelman and Yair Ghitza found that the political events that people experience during their youth are incredibly influential in shaping their political beliefs and identity over their entire lifecycle. Things that happen later in life, from the mid-20s onward, just don’t have the same influence.

The way young people are normalized has significant effects on their entire lives. And the people who are becoming adults in the age of “always-on” connectivity—the soon-to-be workers, leaders, and disruptors of tomorrow—are already adept spectrum-thinkers.
These young people will be more than “digital natives.” They’re coming of age in a time in which social media connectivity is ubiquitous, personal identity is inseparable from online identity, and information is cheap and constantly updated. They are becoming “spectrum-thinking natives.”

In the workforce, this population will have a drastic impact on organizations and will demand full-spectrum mindsets to adapt to that impact.

Traditional workplace roles will diminish relative to constantly shifting roles.

Certifications will diminish relative to inclusive indicators of ability.

Young employees, customers, and investors will demand that companies take a stand on climate and sustainability issues - even if those issues seem tangential to their core business.
One of the major subjects of this normalization effect is sustainability. Those who are in the identity-shaping phase agree overwhelmingly that climate issues are a core concern.

A 2019 Gallup poll found that two-thirds of those aged 18-29 are concerned believers – they feel that climate change poses a serious threat. A Nielsen poll found that 77% of young consumers are willing to pay more for sustainable goods, and Fast Co reported that over 70% of young workers would actually take a pay cut in order to work at a sustainable company.

Beyond these statistics, there are emerging behaviors that—while odd or fringe today—signal the ways that these young people are practicing spectrum-thinking to incorporate their values even more deeply into their lives. While this group are extremely concerned about global issues like climate change, at the same time they are experimenting with new technologies, social platforms, and media. The intersection of these two driving forces will shape the way that young people influence sustainable business over the next decade, as consumers, workers, stakeholders, and policy-makers.
Signal

Teenagers repurpose WhatsApp as a platform for education and generating income

**What:** A young woman in Lagos uses the mobile chat platform WhatsApp to offer classes in makeup and hair design using a mobile payments app to accept tuition from students all around the world.

**So What:** The impact of finding one’s parent’s experience irrelevant, combined with ubiquitous digital platforms, allows young people to pave new paths and be less loyal to legacy systems. This generation looks to repurpose and reinvent platform technologies to better serve their needs and interests—expect users to adapt how they interact with your products and platforms, beyond their intended purposes.

**What’s Next?**

Start-up ventures will be the classrooms of the future, concurrently operating as business partners to large corporations, with young people weaving across spectrums of learning and earning. The best-positioned businesses will be those that can take continuous feedback from their young users to quickly and organically addressing changes and upgrades they desire. In many cases, these changes will be driven by their foundational values to protect the environment and future opportunities.
Twitch streamers broadcast their vital signs, blurring lines between private and public identities

**What:** In a recent case, a group of game streamers broadcasted their vital signs and emotional state to their audiences of up to millions.

**So What:** Traditional roles, like “gamer”, “worker”, or “student” will fall prey to experiments where users question the conventional identity of said roles. Over time, similar shifts in identity questioning will become visible everywhere. As these groups enter the workforce, they will have no qualms utterly reforming what it means to work at a company, to be employed, or to separate the person from the job.

**What’s Next?**

Asking a worker of the future what their job title is will seem like a meaningless question. They’ll have a unique spectrum of offerings that will make them extremely tricky to categorize. Ultimately they will expect the companies, services, and platforms they use to reflect the same fluid relationship.
Social media platforms give people new language to define their identities

What: A series of interviews by a New York Times reporter found that many young people have been able to express their identities in much more depth through social media platforms, even adopting new language to describe themselves and base their core identity on these platforms.

So What: Social media companies are driving how people conceptualize themselves. As the influence of digital identity platforms increases, young people who might have once identified as “eco-conscious,” “sustainable,” “vegetarian,” etc., will soon develop their consumer identities through the language their provided on those platforms.

“Hashtags and profiles are influencing an entire generation of people who now often develop their sense of selves online.

“As [an interviewee] told me, ‘People are finding ways to articulate how they feel about themselves, and that’s what happened to me too.’”

- Jenna Wortham

What’s Next?

This concept will spread out from highly personal social issues to a multitude of ways to build one’s identity. The future will be home to groups of people who would never describe themselves as simply ‘liberal or conservative,’ ‘employed or unemployed,’ ‘citizen or foreigner,’ and so forth, empowered in large part by the spectrums offered by digital platforms.
One of the ways that young spectrum thinkers are already starting to manifest their way of thinking is through the increasing “value of values.” Expect this mindset shift to take over all aspects of life – personal, professional, and beyond.

Young people will demand that organizations take strong and clearly defined stances on social issues that they may previously have never considered. An organization’s stance on social, political, and environmental issues will be important to young people, even when those issues are seemingly irrelevant to an organizations’ core business.

This population doesn’t see a meaningful separation between the operation of a company and the social stance it takes. Just as they see individuals as existing on a spectrum of identity, so do they see organizations. A company is not just a company, it’s a spectrum of business, social and sustainable value, all of which can make or break the relationship an individual has to that company.

The best sustainable businesses, in addition to their core services, will become options for identity alignment for young consumers.
Young people (especially those in the 14–24-year-old range) are currently building the systems and strategies they will use to work, learn, make money, and impact the world. Many of them are doing so quite successfully, in ways that have never been seen before. They are iterating and improving these systems multiple times before they even consider traditional working paths—that is, if they see a reason to consider traditional work.

Operating in a new spectrum of meaning means broadening your measure of value beyond categorical signifiers. In a near future of extreme transparency, recognize the value of values in your business. Passivity on social issues may no longer be an option. Expect to be actively and continuously challenged by youth, welcome diverse perspectives and respond with broad transparency.
Future Forces Disrupting Sustainable Business

Four future forces have been presented here:

- New spectrums of meaning
- New spectrums of time
- New spectrums of resources
- New spectrums of value creation

All require that you approach the future with a full-spectrum mindset. Full-spectrum thinking will require discipline and sophisticated use of digital tools. Full-spectrum doesn’t mean letting go of structure. In fact, in some cases, the spectrums arise out of lots of categories running together.

It will be very dangerous if leaders unthinkingly force new threats or new opportunities into old categories that just don’t fit the new circumstances.

The future will demand full-spectrum thinking.
How can you use this external foresight to provoke your own insight?

Drawing from Institute for the Future’s *Foresight Practitioner Training* workshops, here are two tools that you can use:

**Draw out Consequences** extends and stretches the foresight to explore chains of events and long-term implications. Through this process you can surface assumptions about causality to gain a deeper understanding of future possibilities. Draw out consequences informs choices.

**Mapping a Cross-Impact Matrix** helps create a systemic understanding of how future forces might impact an entire community, organization, or industry. It allows you to draw meaning from complexity by exploring how multiple forces could interact with one another.

Both of these tools are templatized frameworks that you can use to create your own useful insights—whether or not you agree with the IFTF forecast.
Drawing out consequences

- New spectrums of meaning
- New spectrums of time
- New spectrums of resources
- New spectrums of value creation
DRAW OUT CONSEQUENCES

As you begin to deepen your foresight, one of the most important activities is identifying consequences. Chains of “if, then” statements are the most common form of stating first-, second-, and third-order consequences as we move from initial foresight to more complex forecasts and scenarios. A graphical representation of these chains of consequences is often called a futures wheel.

Extend the four future forces to more robust chains of events and long-term implications.

Identify assumptions about causality, and gain deeper understanding of future possibilities.
draw out consequences
For example, using New Spectrums of Time

For example, using New Spectrums of Time
Decrease in large prototype investments
Ten-Year perspectives are rewarded
People recognize that the present is too noisy for Present-Forward strategy
Organization encourages “hack-a-thons”
For example, Implement a Future-Back strategic framework in your company

1st Order Impact
2nd Order Impact
3rd Order Impact
2nd Order Impact
2nd Order Impact
2nd Order Impact
2nd Order Impact
3rd Order Impact
3rd Order Impact
3rd Order Impact
3rd Order Impact
For example, using New Spectrums of Time

**1st order** For example, your organization encourages “hack-a-thon” type events to create fresh ideas for innovation

**2nd order** Small-scale prototyping becomes the norm

**3rd order** New measures of long-term value are created and accepted

Organization encourages “hack-a-thons”
Mapping cross impacts

- New spectrums of meaning
- New spectrums of time
- New spectrums of resources
- New spectrums of value creation
MAP CROSS-IMPACTS

By juxtaposing forecasts across a variety of “impact zones,” we can visualize complex futures and systemically identify threats, opportunities, and insights.

Create a systemic understanding of how large-scale changes might impact an entire community, organization, or industry.

Explore intersections to identify unexpected opportunities.
### Map Cross-Impacts

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<th>Society</th>
<th>Business Unit</th>
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**FOR EXAMPLE…**
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Materials and infrastructure will evolve through deep technology

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Full-spectrum natives will lead shifts toward more inclusive, diverse, and unusual values

NEW SPECTRUMS OF time
Organizations will adapt to future back-strategy to navigate competing pressures
For example, what might be called “traditional” sustainability (the suite of actions that includes developing recyclable products, buying carbon offsets, or developing marginally more efficient production) will be left behind by the new sustainability enabled by this spectrum of resources. AI-driven discovery, lab-grown materials, etc. will drive the most significant gains in sustainability. Companies that don’t operate in this new paradigm will struggle to meet new public expectations of what “sustainable” means.

For example, tipping points, where new and highly efficient materials or processes overtake current methods, will be triggered by increasingly complex factors interacting together, and thus harder to predict or even fully understand.
What are your Insights—given this foresight?

- For example, people are finding new ways to create value with assets like yours through new networking and AI technologies. In more and more cases, they will be driven by the desire for sustainable production – whether that be home-scale solar panels, blockchain-based nature conservancy, or entirely novel ways of value creation. To avoid disruption by micro-scale initiatives, look to the ways that artists, families, entrepreneurs, and local communities are fulfilling their needs for sustainable production.

- For example, decentralization has established itself as a central tenet of data and computer systems. In the coming decade, this concept will be reflected in value creation systems as well. Service delivery, supply chains, and even organizational leadership will become distributed. Such organizations that have sustainability “coded in” (that is, defined at a core level) will achieve sustainability goals more robustly in this paradigm.
For example, by creating the dedicated capacity to conduct early experiments in future-back planning, organizations will be able to discover what sustainability initiatives could achieve over long time frames, letting go of concerns of cost, technology development, and internal capacities.

For example, sustainability initiatives, by nature, can take a long time to come to fruition. Turning strategic planning upside down – by focusing on relatively far-future markets to guide today’s decision-making – will allow for some of the more ambitious sustainability initiatives to appear more viable.
For example, don’t just look to market research to understand consumer demand around sustainability; look at the language that young people are using to describe themselves, especially on emerging social media platforms. This is the new starting point for young people to defining their identity, whether that be gender or consumer identities.

For example, young people will be vastly more flexible with the divide between their private and professional lives. That includes bringing their stance on environmental and social issues to their workplace, choosing their employers, their customers, and their career moves based on whether organizations are aligned.

For example, prepare to take proactive stances on social issues, even those seemingly unrelated to your operations. It will be better to pre-emptively take a decisive stand on environmental and social issues than to be called out for being passive or arriving late.
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