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The next frontier:

Innovating toward
Sustainable Abundance

EAMONN KELLY

Introduction:

A decisive moment

“Sometimes we stare so long at a door that is closing that we see too late the one that is open.”

—Alexander Graham Bell

Many previous generations have regarded their own era as unique and their own opportunities and challenges as unprecedented. They have generally been right; the world has never been static, simple, or certain. Disruptions and disasters have regularly and profoundly changed (and taken) great numbers of lives; and the rate of human progress has been accelerating for centuries, frequently upending established lifestyles for millions. Now it is our turn, and like our forebears we must together find our own new pathways through entirely uncharted terrain.

Today, technology, a reliably transformative force throughout history, is creating radically new and powerful capabilities, most notably through artificial intelligence (AI) and synthetic biology; the potential benefits are almost unimaginably great, while the latent perils are perhaps equally significant. Core economic and societal systems that have long supported and dramatically improved human life on planet Earth are coming under stress, and our political and geopolitical systems are fraught with dangerous tensions. Perhaps most importantly, our physical environment and climate are changing—to degrees and with consequences that remain uncertain but appear increasingly likely to be severe. We are an ingenious and determined species, and we can—and must—respond and adapt to our new challenges and opportunities with large-scale, systemic, and innovative responses. But this will demand coherent, collective, and committed effort that some of our most critical institutions and leaders may not be fully prepared for.

Business leaders—many still understandably focused, perhaps, on returning their organizations to a more “normal” state of affairs following the deadliest global pandemic in a century—might regard the creation of new pathways through the disruptions ahead as primarily the work of others, beyond their own remit. Yet, over the past two centuries, businesses have played a leading role in driving progress. We have fundamentally shaped the present world—and are significant beneficiaries of the remarkable progress we have helped achieve. We therefore have both the agency and the incentives to play an equally central role in shaping a better future by helping lead and navigate through the inevitable transitions ahead.

Even the most challenging journeys are much easier when guided by a clear and shared sense of the desired destination. That is elusive today. Arguably, more people are clear about the future they do NOT want. Some are focused primarily on avoiding potentially devastating climatic and environmental breakdowns; others fear disruption of much that they have already achieved, greatly value, and naturally wish to protect; and almost half the world’s population do not wish to continue living so perilously close to basic subsistence levels.¹ The tension between these priorities for our future might on the surface appear irreconcilable—but each is firmly rooted in fundamental and **shared human characteristics**.

Fear of environmental collapse reflects our powerful desire to ensure that our species survives and thrives, by protecting the interests of our offspring and those who will follow them (which is the essence of **sustainability**, first meaningfully defined in 1987 in the UN’s Brundtland Commission report as “meeting the needs of the present without compromising the ability of future generations to meet their own needs”).² The desire to preserve what we already have is driven by our powerful and compelling aversion to the loss of anything we hold dear—a natural impulse even stronger than our desire for further gains.³ And those still living uncomfortably close to subsistence levels are still striving to address the very basic human instinct that has largely driven our progress throughout our 200,000-year history: the desire to escape the threat of scarcity of what we most need and desire, by creating **abundance** of, and access to, all that enables us to survive and thrive.

Each of these strong urges is deeply embedded in our biology and cultures, and each must be honored and respected. To dismiss or discount any one of them, or to treat them as stark “either-or” choices that divide us, would be a denial of the fullness of our own humanity. Creating our shared future therefore requires that we integrate and align them, in mutually reinforcing harmony. **This is the potential offered by embarking, together, upon the journey toward Sustainable Abundance.**

“Sustainable Abundance.” The notion might sound like an oxymoron, or a fantasy. But it is neither; it is an imperative. While it will demand significant changes, it is also achievable—with shared commitment and focus. There is currently no clear map for the journey ahead, but some high-level elements of the direction of travel are already clear—and should now be the paramount focus of intensive, continuous, and collective innovation. We should substantially reduce the resources used by, and the environmental and climatic impacts of, every dimension of our current economic activity, while preserving and spreading as much as possible of the human value it creates; we should proactively design sustainability into all new economic activity—as an imperative first principle—as we continue to advance human progress; and we should greatly increase the accessibility and affordability of **all** that is essential for **all** humans to survive and thrive.

Although our bountiful planet is capable of supporting quality lives for all 8 billion of us (and the 2 billion more forecast to join our population as we reach our peak), this will inevitably be a disruptive undertaking, demanding extraordinary levels of collective innovation of our economic production and distribution models. It will also require creative innovations to fulfill human needs and desires, and enrich our lives, in ways that are less dependent on the constantly increasing levels of consumption—and waste—that have come to characterize our economies over the past 100 years but are in fact a valuable but imperfect proxy for truly fulfilling abundance. Businesses have been central to every epoch of progress-defining innovation; today we are being called upon to provide such leadership again.

Innovation is not always based on entirely new inventions; it is also driven by the recombination of things that were previously separated and distinct. This is especially true when values or disciplines that have been regarded as inherently incompatible opposites are brought together, not as belligerent opponents but as mutually catalytic partners. Perhaps the most striking example from the world of business has been the dramatically recast relationship between cost and quality. Fifty years ago, these were generally seen as mutually exclusive choices, a direct trade-off. The quality movement proved the opposite to be true, shattering a deeply held but outmoded mindset and triggering substantial leaps of creativity, invention, and profitable progress for businesses and the world.

We are at a similar moment today but with far higher stakes. Our journey toward an abundance that fully satisfies us will likely never be completed; but it can now be accelerated, and made more accessible to all of us, including the billions not yet meaningfully participating in the current consumer economy.⁴ And it can—and must—be sustainable and available for the generations to follow. This need not be a zero-sum game. It need not be a win-lose competition between today’s generations and those who will follow; between growth and our planet; between profitability and responsible stewardship.

The coming decade will require outstanding leadership, open minds, fresh thinking, and confident action—underpinned by an informed belief that Sustainable Abundance is truly within our reach but now requires our collective and determined commitment to bring it within our grasp. A new, informal, but powerful innovation agenda is already emerging to do so. This paper is a modest contribution to its ongoing development—and a call for even greater business participation in forging the paths to our better future.

Will the future be determined by default... or by design?

In November 2022, *Collins Dictionary* declared its word of the year: “permacrisis,” defined as “an extended period of instability and insecurity.” Two months later, the closely related term “polycrisis” was frequently expressed at the World Economic Forum’s Davos 2023 gathering of world leaders. While the words might sound awkward, it is hard to dispute their core meaning: Multiple critical systems that play foundational roles in supporting and organizing human progress on planet Earth are simultaneously coming under severe stress.

Political systems, even in some well-established and stable democracies, appear increasingly challenged, partisan, and polarized. The **geopolitical environment** is fraught with dangerous tensions and conflicts. A long-standing trend toward more open **trading systems** has been disrupted, as resistance to decades of globalization has grown in many parts of the world, and protectionism has been rising, with potential implications for the stability of **economic and financial systems**. **Digital technology systems** continue to accelerate and spread in impact and, with the coming of age of Generative AI, appear increasingly unpredictable in their impacts. New technologies are also contributing to the disruption of **societal systems** and norms, with even historically stable nations experiencing mounting polarization and conflict, the erosion of elemental shared “truths,” and growing inequality in many parts of the world.

These systems are under great stress today NOT because they have failed—but because they have profoundly succeeded in so many ways in creating a far better world.

A hundred years ago, one-third of live-born children died before their fifth birthday; today it is less than 4%.⁵ Fully two-thirds of adults could not read or write; today that is down to 11%.⁶ Barely 30 years ago, more than a third of humans lived in extreme poverty, and now that number is just under 10%.⁷ In the early 1990s, only around 1 billion people could be categorized as “consumers” (regularly purchasing goods and services to support a lifestyle measurably above subsistence levels)—today, there are more than 4 billion of us.

Our human-invented systems have worked spectacularly for their intended purpose—but **they were all prototypes, not “final” versions set in concrete for all time**. They have helped forge a new era for which they were not designed, and which now, in turn, demands their reinvention. The dramatic progress they have enabled has also irrevocably altered the most critical systems of all, upon which our very existence is entirely dependent: **Our planet’s climatic and environmental systems are now challenged in ways and to degrees so significant that we will only fully understand them as we experience them.**

History is in motion, and our direction of travel remains undetermined. Glimpses of dystopian possibilities no longer spring only from the imaginations of science fiction writers; they are vividly foreshadowed in the news every day. The “default settings” on many of our now-outdated systems are likely to steer us down a bumpy path, toward a destination very few of us will welcome. The core systems that have so ably driven our progress for a hundred years and more must now be redesigned, their defaults reset. The ingenuity, passion, determination, and high aspirations that have created our remarkable present world have not diminished—on the contrary, they are clearly evident in efforts underway in every corner of the world. But we must now acknowledge that a new, collective, and ambitious response to our mounting challenges is imperative. We can, and we must, help design a better future.



Today's challenges that demand systemic redesign

Humanity has made truly extraordinary progress over recent centuries and decades, transforming billions of lives for the better. But the natural and human-designed systems that have supported this journey are coming under growing and increasingly clear stress.

- Ice core readings show that throughout the 10,000 years between the agrarian and industrial revolutions, carbon dioxide levels in the atmosphere varied by about 1 part per million (ppm) every thousand years. Today they are increasing by 4 ppm every year and have tripled since the 18th century.⁸
- The Earth's average surface temperature has increased by more than 1°C,⁹ the past eight years have been the warmest on record, and 2023 was the warmest ever;¹⁰ ocean acidity has risen by 30%;¹¹ ocean surface temperatures hit historically high levels in March 2023;¹² Arctic ice loss continues to increase, and unprecedented Antarctic ice loss is now also occurring.¹³
- These and other changes in climate patterns are consistent with established forecasting models based on increasingly validated scientific hypotheses and substantially improving and more comprehensive measurements but are now consistently trending toward the most disruptive, rather than the more moderate, forecasts.¹⁴
- The world still relies on fossil fuels for 82% of total energy consumption;¹⁵ if we were to halve carbon net emissions today, average temperatures would still keep rising for decades.¹⁶
- Since 1970, species populations have declined an average of 69%,¹⁷ and 41% of amphibian, 27% of mammal, and 13% of bird species are now threatened.¹⁸
- Outdoor and household air pollution are associated with 6.7 million premature deaths annually, with most occurring in low- and middle-income countries,¹⁹ while air pollution in the United States causes roughly \$77 billion in health impacts every year.²⁰
- By 2025, two-thirds of the world's population will face some form of water shortage.²¹
- Global population has grown exponentially since the Industrial Revolution and is expected to reach 9.7 billion people in 2050 and peak at nearly 10.4 billion in the 2080s, putting immense pressure on natural resources and communities.²²
- Wealth inequality is worsening, with the world's richest 1% capturing nearly two-thirds of all new wealth (\$42 trillion) created since 2020, almost twice as much wealth as the bottom 99%.²³
- More than a third of humans lack access to the internet.²⁴
- Mental health is worsening around the world, affecting roughly 20% of children and adolescents and 20% of people in post-conflict settings. Depression and anxiety cost the global economy \$1 trillion each year.²⁵
- Purchasing power for the average US citizen has declined over the past 20 years for the most fundamental human needs, including medical care services, childcare, food, and housing.²⁶
- Life expectancy in the United States dropped sharply from 2019 to 2021, primarily due to heart disease, cancer, COVID-19, and the ongoing drug overdose epidemic.²⁷
- More than 350 global executives, researchers, and engineers working in artificial intelligence are warning of AI's existential threat to humanity and urge the prioritization of risk mitigation on a global scale.²⁸
- Geopolitical tensions are rising, with the Global Peace Index deteriorating for 13 of the last 15 years. The largest year-over-year deteriorations occurred in external conflicts fought, deaths from internal conflict, and political instability indicators.²⁹
- The Economist Intelligence Unit's Global Democracy Index had democracy declining every year from 2018 to 2021.³⁰

Answers questioned? An era of discontinuity— and opportunity

With multiple fundamental systems coming under growing duress, age-old and very deep questions—around which many strong orthodoxies, assumptions, and beliefs have accumulated—are resurfacing. What role should business play in society—and government play in the economy? What are the benefits and costs of globalization? How can we encourage those with great power and wealth to use it for the benefit of our societies rather than for the pursuit of less inclusive interests? Are our ever-expanding technological capabilities outpacing our wisdom to deploy them—and if they now pose as much hazard as opportunity, how should we respond? Perhaps the oldest and biggest question of all: How can we best protect and enhance those aspects of our lives that we most deeply cherish, and ensure that they remain available to our younger generations and those to follow?

Some might be convinced that many of these matters have already been fully and permanently resolved. But the pace and scale of change are far too great, our world far too complex, and our present situation too unique, and too fraught, to assume that recent answers to even some of our oldest and most fundamental questions are settled or sufficient for the challenges we now face.

In a variety of guises and formulations, these and related questions are appearing with growing urgency across civic and political debate. There is little meaningful consensus regarding many of them; on the contrary, some seem to be the source of mounting conflict and polarization. And the answers will not be provided exclusively by any single actor—no single national government nor global institution can define our future. Rather, we will collectively answer these questions, for better or worse, more through our aggregated decisions and actions than through theory alone—especially those holding leadership positions in this fluid and critical moment in history. All humans are stakeholders today, equally invested in our shared future. But business leaders often have disproportionate agency and voice, and together we have extraordinary influence, resources, and capabilities to activate. With that comes a growing weight of responsibility and accountability.

We are already in an era of profound shifts, innovation, and discontinuity.³¹ Assumptions and orthodoxies that have underpinned our rulesets for decades are clearly being challenged, and some are already starting to unravel. Meanwhile, many limitations on our capacities and capabilities are being reduced rapidly by technological advances. These shifts are underway, but each must be accelerated and targeted toward boosting the critical innovations required for our journey toward Sustainable Abundance:

Responsible business

Reperceiving “globalization”

Return of government

Rising networked power

Radical science and technology

Responsible business

What's changing?

After decades of rigorously focused shareholder capitalism, a growing number of businesses are now actively embracing broader models that explicitly prioritize the interests of multiple stakeholders.

So what?

Access to capital is obviously critical, but long-term growth and shareholder value also fundamentally depend on other resources and assets³² (and some now even argue that capital is declining in its centrality).³³ Businesses should strive to better understand and meet the requirements of their multiple stakeholders and more carefully examine and ameliorate the unintended negative externalities arising from their activities. This will become table stakes as businesses actively reconfigure their activities in the years ahead.

In the late 20th century, capitalism embraced the then-novel view that the purpose of business was to maximize short-term shareholder value.³⁴ Doing so helped stimulate and spread remarkable economic growth and prosperity and helped to simplify the growing complexity confronting most business leaders. Axiomatically, many aspects of life and work are simplified by focusing almost exclusively on one value and heavily discounting other factors. But this has led to unbalanced and unhealthy practices that have manifested in the mounting costs of “externalities.” These are the costs (sometimes also benefits) directly associated with an economic transaction that accrue not to the buyer or seller but to other people, or communities, or societies, or our shared environment. As we have marketized more and more of our societies and expanded the impacts of our economies, our negative externalities have also expanded, with deep impacts that include but are not limited to human-caused climate change.

There are four obvious ways to address externalities: ignore them, price them, regulate them, or take responsibility for minimizing or eliminating them.

Ignoring them is reckless, and pricing them is extremely complicated and can even lead to negative unintended consequences. The surge in interest in and commitment to ESG across many major businesses in recent years is evidence that many leaders are now choosing to take the fourth path of responsibility—in new ways and at new levels.³⁵ This represents an important shift from an almost exclusive focus on shareholder value to a much more **inclusive focus on cross-stakeholder value creation**.³⁶ Predictably, this shift is being criticized from opposing directions. Some observers have accused businesses of “greenwashing,” overstating, or misrepresenting climate and sustainability commitments. Others argue it is an abandonment of responsibility to shareholders. But the migration from shareholder to stakeholder capitalism (which, of course, includes shareholders) appears to be a widespread rebalancing; an increasingly central priority for many; a means of protecting, amplifying, and spreading the benefits of democratic capitalism; and a prerequisite for our collective journey toward Sustainable Abundance.

Reperceiving 'globalization'

What's changing?

Having reached a plateau in the rapid expansion of cross-border trade,³⁷ globalization is now manifesting instead in increasingly distributed innovation activity, growing interdependence around shared challenges, and highly fluid geopolitics.

So what?

Successful navigation of this new landscape will, in part, require businesses to access and contribute to the far more diverse, globally distributed, and sustainability-focused innovation that is now underway and to prepare for the growing longer-term possibility of production and consumption of physical goods moving closer back together—a stark reversal of the trend of the past 50 years.³⁸

For decades, the term “globalization” was used to describe steadily increasing levels of cross-border trade, which grew as a percentage of global GDP from 25% in 1970 to 61% by 2008.³⁹ This explosive growth provided opportunities for then-developing countries to become active players in the global economy (and generate “middle classes” with their own consumer economies) and for businesses in developed countries to take advantage of wage arbitrage and production efficiencies and to sell to new and fast-expanding global middle-class markets. This era of globalization played a central role in creating today’s vast consumer economy and an overwhelmingly benign environment for most large businesses. But while we still benefit from the opportunities that era provided, the process of increasing globalization essentially ended 15 years ago.⁴⁰ The global financial crisis dramatically reduced cross-border trade, and rising populism, protectionism, and geopolitical tensions have prevented it from ever exceeding its 2008 peak again. It likely never will, as ongoing advances in digitized, additive, and distributed manufacturing technologies enable production of goods much closer to their point of consumption.

Globalization still matters greatly—but differently. It is now characterized by three key dynamics: more widely distributed capacity for critically important **innovation**,⁴¹ a marked departure from the Western dominance of recent centuries; broadly manifested **interdependence** in the face of shared and mounting challenges, most obviously climatic and environmental; and fraught and fluid **geopolitics** that are leading simultaneously to increased conflict and important new collaboration.

Businesses will need to learn how to navigate over very slippery terrain, as economic interdependence is stable or declining, civilizational interdependence is rapidly growing, yet global relationships are competitive, and some are deteriorating and confrontational.

Return of government

What's changing?

The role of governments in the economy has varied significantly over history and geographies. For the past 40 years or so in developed countries, there has been a tendency toward minimal government intervention, extensive marketization, low taxation, no (or low) government deficits, and as-free-as-possible trade. These principles are unlikely to be fully abandoned; however, around much of the world, many citizens and even businesses are looking to government for increased leadership around mounting challenges like climate change, technological disruption, growing inequality, and security threats.⁴²

So what?

Businesses should prepare for the prospect of greater governmental involvement in the economy, which may be fluid and changing, depending on political leadership. They should also be ready to forge deeper, more open, and more co-creative arrangements with political government leaders.⁴³

The optimal role of government has been a subject of political debate—and heated conflict—for millennia. After the demise of the USSR, some believed this debate was completed, and that markets, free trade, and a benign form of capitalism had permanently triumphed. This argument was supported by growing agreement within and between most developed nations that governments should eschew—or at least minimize—active intervention in the economy. But optimizing the role of government in the economy has proved a more complicated matter than many assumed, for three reasons. First, while bad industrial policy—including “picking winners,” “crowding out the market,” and “five-year plans”—offer cautionary warnings, intelligent government investment and industrial policy can be highly effective—as demonstrated by the lessons from Japan and Germany in the 1950s, the Asian Tigers in the ‘60s and ‘70s, and China since the ‘80s.

Second, throughout history, even in relatively resilient and self-reliant societies, citizens and communities have repeatedly turned to governments for leadership, support, mobilization of resources, and coordination of efforts at times of war, famine, natural disasters, and other upheavals. We are now again entering such times, on multiple fronts. Climate change has already arrived. Technology advancements, notably in AI, are raising new questions about government involvement in the activation of the new capabilities and potential risks they are creating.⁴⁴

Mounting geopolitical tensions are raising the prospects not only of violent conflict (supported by almost unimaginably more powerful—and more widely accessible—weaponry than has ever existed) but also economic and trade wars. Here again, greater government involvement will likely be required to ensure protection and security, and to help support and guide economic progress.

Third, governments have frequently been enablers and drivers of critical infrastructure development (laying railroads, electrifying cities, constructing freeways) as well as breakthrough innovation, and both will be needed again as we adapt to a changing climate. For example, the US government directed and led early space exploration and through the Defense Advanced Research Projects Agency (DARPA) has funded (and continues to fund) a vast array of the digital, biotechnological, and nanotechnological developments that have created the modern world. Today, with a rapid extension of innovation capabilities around the globe, many more governments are playing similar leadership roles, helping drive the new innovation agenda that is now essential.

Governments have contributed far more to human progress than is often acknowledged and appear poised to play critical future-shaping roles in many parts of the world today.

Rising networked power

What's changing?

Amplified by massive digital connectivity and information-sharing, networked power models are joining—and sometimes challenging—conventional, hierarchical models of influence and fostering the emergence of highly collaborative, co-creative, and productive cross-sector ecosystems.

So what?

Active participation in and support for these nascent networks and ecosystems will prove pivotal for mainly hierarchical organizations to unlock innovation and drive positive societal change. The most visionary businesses will partner with these networks, providing the promise of discipline, scale, and greatly increased impact.



Power—who has it, how they get and use it, the rules they set with it, how they treat those who don't have it, and the checks and balances they face if they abuse it—has defined our societies, economies, and lives. Throughout history, the dominant model of power has been hierarchical and centralized, operated primarily through command-and-control systems. Though tending to lack speed, agility, and responsiveness, these systems have generally proven both stable and highly effective at getting things done. But a very different model of power has also helped shape human life, frequently driving change and punctuating history. Networked, decentralized, autonomous, and collaborative models of power and influence have regularly emerged as strong (though usually temporary) forces, often to tackle the abuse of traditional power and achieve transformational reform. In the words of cultural anthropologist Margaret Mead: “Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has.”

In recent years networked power has been significantly amplified in our digital world, and we have witnessed grassroots movements help trigger societal changes that affect the behaviors and priorities of organizations. As a teenager, Greta Thunberg, lacking any formal authority or even structured organization, catalyzed millions of youth climate activists globally.⁴⁵ Platforms like eBay, Etsy, and Shopify enabled new levels of highly distributed economic activity, with tens of millions of active participants.

Open source has transformed software development and helped drive the proliferation of life-enhancing apps—and is playing a growing role in intelligence and defense today, including currently in Ukraine.⁴⁶ A variety of citizen-led investigative organizations play a major role today in tackling disinformation. Other networks, such as Facebook and the newly rebranded X, demonstrate the concept of Metcalfe's Law,⁴⁷ playing hugely influential roles in spreading news and memes and shaping civic opinion.

Like hierarchies, networks have limitations. Twenty-five years ago, many expected that the internet would cause massive and sudden decentralization, fundamentally shifting power away from formal institutions. Such a binary switch has not occurred and almost certainly will not.

But networked power is now a permanent and readily mobilizable force in its own right—and can now also be blended more effectively with hierarchies, to audacious ends. We can see this vividly in the steady restructuring of our economies, as hierarchical organizations from multiple sectors come together in highly productive and co-creative ecosystems, within which each actor can activate assets and capabilities that they neither own nor control.⁴⁸

Radical science and technology

What's changing?

The exponential progress of technologies including AI, biotechnology, and nanotechnology is ushering in a new era of scientific discovery and opening up rich new frontiers for innovation—while also presenting considerable recognized risks and challenges.

So what?

The speed of innovation and progress will undoubtedly continue to accelerate over the next decade—but its direction will hinge largely upon business leaders' ability to embrace these technologies to help create and capture new value in more equitable, sustainable, and accessible ways.⁴⁹

Over the past 50 years, the exponential force of Moore's Law has driven remarkable and world-changing technological progress. Although Moore's Law is approaching its physical limits, it is now forcing further investment and innovation that will significantly accelerate that progress. Software will continue to "eat the world." Specialist chip designs and new architectures will continue to increase computing power, while new materials will likely displace silicon over time. New forms of computing—possibly both quantum- and biological-based—are expected to deliver almost unimaginable further advances. Biotechnology and nanotechnology will join digital technology as world-changing forces.

Today, major concerns are being voiced about the potential impacts of artificial intelligence. The launch of ChatGPT in fall 2022 was an emblematic event, bringing us to a long-awaited tipping point—reaching 100 million active users in only two months⁵⁰ and priming further acceleration from a phenomenon we have witnessed with prior digital technologies: The more they are used, the "smarter" they get. As a result, the prospects of a meaningful form of artificial general intelligence emerging in the years ahead have also greatly increased. While the concerns expressed in many quarters are substantive, legitimate, and demand careful attention, they should not blind us to the extraordinary opportunities now opening.

AI will enable new automation of large swathes of work, generate immense efficiency gains, inform wiser decisions, and help resolve complex and even previously intractable problems. But perhaps its greatest promise lies in heralding a new model of scientific discovery—only the second in human history. The first scientific method was created a thousand years ago in the Islamic universities of the Middle East and built on human observation of nature, the development of hypotheses to explain how things worked, the design and iteration of experiments to test those hypotheses, the discovery of scientific truths, and from those the development of applications—the technologies that helped create the modern world.

The new model is based instead on interrogation of growing volumes of digitized data through powerful algorithms that leads to automated discovery of unexpected correlations—and now even causations. Science has, for a thousand years, driven human progress at breakneck speed. Today it is poised to further accelerate that progress dramatically—over years and decades, not centuries.

Rich new frontiers will open up, creating new "worlds" of opportunity, including:

- Inner World, where technology commingles directly with human and other life forms.
- Mirror World, an increasingly perfect and complete digital replica of our planet that will steadily merge with our economies and societies.
- Off World, as space becomes coupled with our earthly economy through manufacturing, communication, and potentially energy capture.
- War World, a sobering reminder of the growing capacity of technology to transform our abilities to cause harm to each other, but where advances can also enhance our security.
- Habitable World, as technology already empowers millions of creative entrepreneurs, scientists, and engineers today all around the world to create innovation to protect and heal our planet.⁵¹

Technology alone will not fix our systemic challenges, and its promise comes alongside serious perils. But the new capabilities it produces can readily be deployed—intentionally and unintentionally—in ways that could have very adverse or hugely beneficial impacts.

The new innovation agenda for Sustainable Abundance

“It is commonplace for something once deemed impossible to become improbable and then inevitable.”

—Dr. Regina E. Dugan, former Director, Defense Advanced Research Projects Agency

The shifts described above are altering the business landscape in ways that can—and must—directly support the next waves of breakthrough progress. **And now the broad shape of that progress can also be discerned, in an increasingly clear, though still emergent, innovation agenda.**

Innovation has always been the lifeblood of human advancement, typically driven by three interwoven forces: our thirst for an abundance of what we most need, want, and cherish; the need to defend ourselves against threats—enemies, disease, natural disasters, etc.; and the continuous application of our always evolving capabilities to address old problems and grasp new opportunities.

Over recent decades, a primary focus of business innovation has been on the development and deployment of powerful and ubiquitous digital technologies. Even the many entrepreneurial experiments that appeared to fail—notably during the dot-com era of the 1990s—helped establish a plethora of new market ideas and business models that have helped define today’s economy. There is a great deal more still to come in the digital domain, and it is likely to continue powering progress for many decades.

But today other key technologies are converging with our digital capabilities—notably synthetic biology, nanotechnology, and materials science. And, in combination, these are now being targeted at furthering our perennial search for abundance and the more novel imperative of sustainability. Happily, innovation, sustainability, and abundance are proving to be natural companions.

The United Nations, along with other international institutions and many governments, has led the establishment of the critical goals needed to secure a sustainable future.⁵² But the broad spectrum of innovations to marry these imperatives with the continued satisfaction of human needs and desires is extremely complex and dynamic, and defies top-down or centralized definition or coordination. It requires an emergent process, engaging a rich variety of stakeholders, including institutions, governments, businesses, academics, entrepreneurs, investors, philanthropic foundations, and citizens. Fortunately, this is already underway.

We are currently in the midst of a messy and fluid set of endeavors that are critical for the next waves of human progress. No simple framework can possibly capture or do justice to the diverse and dynamic “living laboratory” already energetically at work to shape a better future. But it is now possible to identify some of the most critical **dimensions of our growing collective efforts—and examine how best our organizations can contribute to them:**

- 1. Relaying the foundations... of human survival** by creating new ways to provide the most basic essentials of food, water, and energy.
- 2. Relaying the foundations... of human progress** through reimagining how we learn and grow, how we achieve and sustain health and well-being, and how we live together in safe and thriving communities.
- 3. Reconnecting with nature** by embracing Indigenous knowledge, biomimicry, and synthetic biology.
- 4. Reducing our footprint** through the circular economy, new manufacturing and materials science, and virtualization.

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Will the future be determined
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discontinuity—and opportunity

**The new innovation agenda
for Sustainable Abundance**

Business leadership for this
new agenda

The future of consumption...
and persuasion?

Conclusion

1

Relaying the foundations... of human survival

Food. Water. Energy. Today, even these most fundamental human needs—the primary origins of our biological urge to create abundance—are insufficiently abundant and insufficiently accessible to all of humanity. And they are also each subject to rapidly growing stress and themselves placing unsustainable pressures on our planet. But the depth and breadth of innovation and experimentation now underway on each—while at varying stages of development and efficacy—are extremely encouraging and poised to create vital new pathways to a better future.

Key areas of innovation

Food

Our planet could sustain far more of us, yet today 735 million people are undernourished, and 43 countries have alarming hunger levels.⁵³ Moreover, our current food systems drive a third of greenhouse gas emissions⁵⁴ and contribute to deforestation, water shortages and inequality, toxic pollution, and nutrient overloads in the biosphere. And fully one-third of food produced globally is wasted.⁵⁵ These challenges are being addressed through a proliferating number of promising innovations that aim to **improve traditional food production methods** (e.g., adopting regenerative farming and precision tech such as drones or Internet of Things [IoT]), **create radically new production methods** (e.g., animal and dairy precision fermenting or lab-grown meats), and **pioneer new types of foods** (e.g., plant-based meats or alternative proteins). These innovations enable less resource-intensive and harmful food production, while sustainably providing abundant and nutritious food sources.⁵⁶

Water

Water, the most essential element for human survival and our abundant environment, is not safely and reliably available for more than 2 billion people and gives rise to both local and international competition and conflict.⁵⁷ Worsening climate change is seriously exacerbating these issues and further stressing water infrastructure, exposing deep vulnerabilities in even some of the most developed nations. Fortunately, the business world can offer solutions by amplifying the inspirational efforts of innovators, governments, and communities in **how we source, treat, and distribute water**. Governments and policymakers are partnering with tech companies to innovate digitally enabled solutions that work across the water-tech ecosystem. Atmospheric generators (air-to-water systems) and improving desalination methods (e.g., microbial or wave-driven) are unlocking abundant, long-term water sources. Innovative treatment and reuse systems and waste-to-ash toilets help reduce costly treatment and sewage systems. “Smartening” legacy systems with advanced IoT sensors enable sustainable and equitable water distribution and help lower costs.⁵⁸

Energy

Since our discovery of and ability to harness fire, access and activation of energy have arguably been the most critical drivers of human progress. However, the consequences of our still-growing reliance on fossil fuels demand urgent and thoughtful remediation.⁵⁹ In addition to significant (and continuing) strides in improving **efficiency** of our use of energy, a critical new portfolio is growing rapidly in three core areas: **energy generation beyond fossil fuels**, including wind, solar (including from space), geothermal, tidal, hydrogen, and small-scale nuclear (which combined with fusion advancements offers the potential of limitless clean power); **distribution and storage** of energy in the form of alternative material batteries, like sodium-ion and iron-air, or decentralized multidirectional energy systems built upon intelligent sensors; and **carbon capture, use, and sequestration** techniques that weave technical solutions like onsite industrial carbon capture with nature-based solutions such as limestone “weathering.”⁶⁰

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Relaying the foundations... of human progress

Just as food, water, and energy fundamentally underpin our ability to **survive**, the capacity to continuously learn and teach, to secure and maintain good physical and mental health, and to create communities in which we can live together safely and productively, underpin our ability to **progress**. Relative to all previous eras in history, we are doing very well on each of these fronts. But we can now go so much further, and faster—and these foundations continue to be insufficiently accessible to much of humanity. With intentional design, innovations in these systems can also accelerate the sustainability of our life on this planet. Significant opportunities exist in these areas, and many companies and organizations are already getting started.

Key areas of innovation

Learning

Globally, education remains inaccessible and costly for too many⁶¹ but could soon be transformed into a broadly accessible and sustainable public good that liberates human potential to the benefit of us all. Efficient digital learning platforms are **bringing down costs**. AI and democratized learning platforms are helping teachers develop tailored lesson plans and curricula more efficiently and effectively and creating customized, approachable, fun AI-based tutors for kids. Pioneering learner-driven models, innovative work apprenticeships, and employer-sponsored education programs are ushering in **novel pedagogy and curricula**, while simultaneously expanding accessibility for traditionally underserved demographics. Meanwhile, **holistic development** is being cultivated through the teaching of critical thinking and civic values, and practicing restorative and inclusive methods. **Sustainability** is becoming core as campuses transition to green infrastructure and empower students with hands-on sustainability experience. These diverse initiatives will help realize education as a driver of innovation and opportunity that develops human potential at scale for a flourishing future.⁶²

Health and well-being

Despite being internationally recognized as a fundamental human right since 1946,⁶³ almost half of the world's population lacks access to essential health services.⁶⁴ Meanwhile, environmental factors like global warming and poor air, water, and food quality also undermine human health. Fortunately, continued innovations aimed at improving human and environmental health are symbiotic and mutually reinforcing. Predictive algorithms, personalized medicine, advanced genomic sequencing, and affordable and accessible digital platforms can bolster **individual well-being**. Advances in medical technology are democratizing access to formerly expensive tools through at-home testing and remote patient monitoring, enabling innovative direct-to-consumer care models that empower individuals to conveniently monitor and improve their own health and wellness. Social programs promoting healthier lifestyles, investments in green spaces and walkable neighborhoods, and virtual technologies are enhancing **community well-being**. And healthier humans are fueling **environmental well-being**—dietary and activity apps are encouraging people to eat foods that are more sustainable or trade in their car for a bike,⁶⁵ while health care providers are investing in renewable, resilient energy systems⁶⁶ to better serve patients while minimizing environmental harm.⁶⁷

Infrastructure and community

Infrastructure innovation is a curious opportunity—developed economies are experiencing challenges with restoring and enhancing aging infrastructure, while countries that experienced massive economic growth in the past 30 years are building modern, efficient, technology-enabled infrastructure. The scale of investment is enormous, with governments and the private sector likely to spend more on infrastructure over the next 40 years than has been spent in the previous 4,000.⁶⁸ Amid all this investment, infrastructure projects are aiming to become more **resilient in the face of accelerating climate change**, increase **accessibility of fundamental needs** to all people around the world, and **improve sustainability of life on this planet**. Innovative, practical solutions, often inspired by nature, are already being developed, designing nature into structures to reduce emissions, utilize locally abundant materials, minimize flooding, capture water for irrigation, reduce heat in urban areas, turn CO₂ and other by-products into building materials, and even provide self-healing properties.⁶⁹

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Reconnecting with nature

Although much of our scientific and technological progress stems from our understanding of and ability to use nature's gifts, it has also served to detach us from it over recent centuries. We are now discovering that maintaining a much closer, more respectful, and more learning-oriented relationship is essential for our future—and holds extraordinary promise. This is inspiring three different but equally critical pathways to Sustainable Abundance: embracing the wisdom of Indigenous people, drawing inspiration from nature's solutions (biomimicry), and—carefully and with deep humility—activating the novel capabilities of synthetic biology.

Key areas of innovation

Indigenous knowledge

Indigenous people comprise less than 5% of the world's population, but their lands make up roughly 20% of the Earth's territory and protect 80% of its biodiversity.⁷⁰ Many governments and businesses are actively seeking Indigenous wisdom to address our most complex sustainability and environmental challenges.⁷¹ An increasing number of innovation approaches are more prominently centering on Indigenous people and practices, including **environmental practices** harnessing thousands of years of observation, experiences, learning, and tradition and a deep respect for nature as a part of the community; **multigenerational and long-term** thinking and decision-making; and emphasis on a **systems view of humanity's interdependence** with nature and with community. Leading projects have empowered Indigenous and local people as leaders, moving beyond mere application (and potentially appropriation) of their practices.⁷² For example, the Indigenous people of the Southern Suriname Conservation Corridor (SSCC) safeguard more than 17 million acres of land, protecting nearly all of Suriname's watersheds and many Amazonian species, while also providing jobs to the 3,000 Trio and Wayana people inhabiting the SSCC.⁷³

Biomimicry

As Janine Benyus astutely pointed out, "life creates conditions conducive to life." Mother Nature, after eons of perfecting solutions in her unparalleled laboratory, safeguards a wealth of time-tested Sustainable Abundance designs available to us. Through biomimicry—the practice of emulating nature's innovations to achieve functional outcomes—we are increasingly able to adopt these designs. This growing field is expected to reach \$425 billion in the United States and \$1.6 trillion globally by 2030,⁷⁴ helping to reweave economic, ecological, and social fabrics into a symbiotic whole. Bio-designers are building products that **imitate naturally occurring forms and processes** (e.g., enzymes "bio prospected" from plastic-eating bacteria, wind turbines mimicking whale tubercles, self-healing materials modeled after regenerative skin) and instituting **systemic changes based on natural ecosystem dynamics** (e.g., microgrids replicating forest interdependence, traffic optimization inspired by ant cooperation).⁷⁵

Synthetic biology

Synthetic biology, also known as syn-bio—the design of new or modified biological systems with new scientific tools—offers the potential to meet human needs and desires without compromising our natural systems. While its activation will require caution and probably significant regulation, syn-bio is already entering the meat, beauty, and pharmaceuticals industries, with agriculture, transportation, and fashion next in line—for example, engineering fungi mycelium as an efficient, sustainable alternative to leather.⁷⁶ Synthetic biologists are **creating scarce raw materials** by engineering microorganisms that break down unconventional feedstocks; **alleviating shortages of critical inputs** by programming bacteria and yeast to digest waste biomass or carbon emissions to unlock new sources of rare earth metals; **optimizing existing industrial processes** by reprogramming microorganisms to improve the yields, rates, and productivity of well-established fermentation technologies; and **conjuring entirely new compounds** by reengineering cellular scripts, like synthetic silk spun by engineered yeast.

4

Reducing our footprint

Popularized in the late 1980s, the term “dematerialization” captures a simple notion: reducing the materials required for economic and societal activity. Unlike “degrowth,” its proponents believe that continued economic growth both depends upon and can be accelerated by prioritizing the reduction of physical inputs. Here again, we highlight three burgeoning opportunity spaces that are rapidly growing and hold great promise: the sharing and circular economies helping to minimize waste by maximizing utilization or reuse; new manufacturing technologies and materials science that help reduce raw material use; and “virtualization,” or the replacement of atoms with digital bits to meet diverse human needs.

Key areas of innovation

Sharing and circular economy

Our global economy is primarily “linear,” with more than 90% of the resources extracted and consumed each year becoming waste and turbocharging climate change.⁷⁷ Even before becoming waste, there are few products that are in use around the clock—many tend to sit idle at least for certain parts of a day, week, or year. The sharing economy has sprung up to optimize resource utilization of such assets and limit the need for individuals to own a wide range of material products, thereby reducing waste. Another solution is shifting to a “circular” economy, which seeks to create a closed-loop system in which resources are kept in use for as long as possible, reducing the need for new raw materials. Innovations are currently occurring within **product design, business models, recycling and donations, regulatory guidance, and ecosystems**. For example, home furnishing companies are redesigning their carpets and mattresses to be multifunctional products. Similarly, the food industry is adopting circular practices; food producers use animal by-products to feed insects that are then turned into food as insect protein for pets, poultry, and fish. Embracing circular economy strategies like these could cut global greenhouse gas emissions by 39%⁷⁸ and help us avoid climate breakdown. In this pursuit, however, we must ensure that circular economy concepts are not used to mislead the public or place too much of the burden of sustainability on consumers and local governments.⁷⁹

New manufacturing and materials science

Today’s production system relies on global supply chains using carbon-intensive manufacturing techniques and transportation-based distribution models. The distance between production and consumption renders it highly fragile and environmentally unsustainable. New manufacturing technologies (like **digital twins and additive manufacturing**) and materials science (such as **biodegradable, compostable, and composite materials**) enable more sustainable materials and packaging, embed more efficient design and development, and extend products’ useful life. They are supporting the longer transition of bringing supply closer to demand by building at the point of use or consumption,⁸⁰ improving the flexibility, resiliency, and sustainability of production systems and increasing access. Additionally, these new technologies and approaches can substantially reduce the carbon footprint of products, diminish the environmental and health impacts of microplastics, and alleviate material waste.⁸¹

Virtualization

The circular economy and new manufacturing technologies offer powerful opportunities to make our physical production and consumption less resource-intensive and more sustainable. But with a rapidly scaling economy and the increasing urgency of the climate crisis, we also need to expand our focus and experiment with how to meet human needs and wants in new, nonphysical ways. Virtualization describes this process of moving from atom- to bit-based (or, physical- to virtual-based) goods and services, and it can support three critical outcomes: **reducing our carbon, water, and land footprint** (as long as we can solve the energy issue for the virtual world⁸²), **augmenting human intelligence** to optimize time and resource use (e.g., virtual reality surgical simulation training), and **increasing accessibility** by bringing prohibitive cost and location barriers down.

Business leadership for this new agenda

Most businesses are contributing to particular aspects of the fast-growing and highly distributed innovation agenda that is now emerging. But few are pursuing this with the required vigor and determination demanded by the scale and urgency of the challenges already in clear sight—and our collective contribution to accelerating progress toward Sustainable Abundance remains insufficient. Business and enterprise have very significantly shaped the present world, and we benefit greatly from the almost miraculous economic and societal progress that we have helped achieve. Now, it is time to provide much greater and more proactive leadership to help confront the issues directly associated with our achievements to date and ensure we have business, physical, and societal environments that allow us to continue them.

Every business will of course have its own unique opportunities to contribute to the next wave of innovation and must determine its own priorities. But there are several shared possibilities we will have in common as we revisit our existing innovation mindsets and practices and better understand the systemic nature of the changes ahead.⁸³ The first might be to adopt Sustainable Abundance as humanity's current and essential North Star toward which we can direct the majority of our innovation capacity—and to that end, we have a lot of collective experience and insight to build upon.

Reimagining the possible: Learning from the quality movement

Most businesses have undertaken (and substantially benefited from) reformulation of a variety of value-creating activities over recent decades. Reformulation recognizes that sustainable practices drive inherent business value: reducing material, energy, and water use also reduces costs; curbing pollution lowers the risk of lawsuits and customer complaints; a healthy, safe, and motivated workforce reduces turnover and hiring costs while increasing productivity; and developing products and services that reduce externalities and contribute to flourishing environments and communities maintains a company's ability to operate while also fulfilling Drucker's mandate to create enthusiastic customers and retain their loyalty over the long term.⁸⁴

But we have very far from exhausted the prospects of such reformulation, and have much left to pursue—again, to our net benefit, not cost. It is worth reflecting here on the similarities and contrasts between the tension currently perceived between sustainability and abundance, and the tension historically perceived between cost and quality. The total quality management (TQM) movement revolutionized business over the course of a few decades, demonstrating that rather than mutually exclusive, cost and quality could be mutually accelerating. We have much to learn from that still recent experience and the comprehensive, systemic approaches that were embraced. For many organizations, an unprecedented practice began: quality-focused leaders systematically engaged people throughout their organizations in the discovery of potential improvements—actively seeking, valuing, and rewarding their inputs.⁸⁵ Best practices were systematically identified, codified, and widely shared with others—this was largely a collaborative rather than competitive endeavor. Multiple dimensions of many businesses were fundamentally “reengineered.”

Quality-oriented expertise was honored and specialist training was provided—notably through Six Sigma programs—to ensure distributed access to and broad distribution of the key bodies of knowledge developed and the mastery achieved. Quality became truly an inclusive and central movement and had transformative impact on most leading organizations; it was not an isolated or siloed responsibility, and it certainly did not reside on the margins. **For many business leaders, the pursuit of sustainability and abundance has similar potential as the marriage of quality and cost reduction, if pursued with the equivalent comprehensive and collaborative energy.**

Innovation intelligence

Many businesses invest considerable resources, energy, and ingenuity in intelligence gathering to ensure they remain aware of and highly responsive to changes and developments related to their markets, customers, and competitors. Far fewer make similar investments in broad scanning and learning about the now rapidly evolving and potentially highly disruptive innovation landscape that is forming around them.⁸⁶

Some of the innovations underway today might prove more immediately adjacent to, and hence quite rapidly have an impact on, our businesses than we might appreciate. And though many dimensions of the current Cambrian explosion of innovations might not affect our particular businesses in the short term, they will without doubt collectively transform every element of our entire economy over the medium to longer term—and the sooner we understand them and, as appropriate, directly engage with them, the better placed we will be to contribute to shaping the future and to thrive ourselves. **“Innovation intelligence”—through continuous scanning of the fast-evolving landscape of the new—does not have the long and proven history of market, customer, and competitive intelligence; but for many businesses it might well become even more important than those already well-institutionalized practices.**

The ‘monetization’ question

Warren Berger, an author whose work is featured in many esteemed publications, has studied entrepreneurship, innovation, and the sources of breakthrough thinking and ideas. He concludes that the starting point for the most powerful innovations is typically what he terms “a more beautiful question.”⁸⁷ One example illustrates his point: Two tech entrepreneurs, stranded on the rainy streets of Paris watching cars whiz by them, ask: “Why, with all this vehicle movement and capacity, can we not find a ride back to our hotel?” The answer was to become Uber.⁸⁸ The questions that we ask invariably direct and inform the answers we seek and find—for better or worse. An unintended (though perhaps inevitable) consequence of the recent era of shareholder supremacy has been that many businesses have established innovation systems that place as the first question used to interrogate every new trend; emergent dynamic, promising technology; or even tentative idea: “How can we monetize this?”

This is itself a beautiful—and imperative—question when asked later in the innovation process, as ideas and options are being developed. But it is a deeply constraining question in the earlier stages of ideation and discovery. For business leaders asking themselves why they are not receiving enough new possibilities, why their colleagues cannot seem to “think outside the box,” why creativity is so hard to find, at least part of the answer may lie in a premature focus on finding a clear, fast-track path to monetization. Switching back to a version of the question that has underpinned and driven human progress for millennia might help put us all back on track: “Given our positioning, resources, and capabilities, and the incredible dynamics reshaping the world today, how can we create new and enduring value for people?” **This is a start point that will help liberate energy and creativity rather than stifle them—and will therefore most likely result in far greater opportunities for successful monetization as well.**

Accelerated partnering, scaling... and acquisition?

Deeper intelligence regarding emergent innovations beyond the walls of our own business also opens up further potential opportunities. Some businesses have developed sophisticated, honed capabilities to observe innovative startups in adjacent spaces, wait to see which prosper and gain traction, and then make moves to partner with or acquire them. We have seen this model in action, for example, in life sciences as biotech companies started to flourish, and in financial services as fintech businesses transformed key market spaces.

This approach is low risk as it involves working with or acquiring only already successful businesses. But it is often costly and slow, and as venture capitalists repeatedly observe, it is often not simply the power of the idea but the strength of the founding leadership team that can directly inform success—and they might not stay in place any longer than partnership or acquisition terms require. **Earlier engagement with promising innovators could help accelerate and scale their efforts and improve their chances of success.** This could not only contribute more, and much more quickly, to the resolution of our specific and collective sustainability challenges, but also create optionality for much more favorable terms to be established for incumbent businesses.

Co-creation: Forging innovation ecosystems for radical progress

With multi-actor and typically cross-industry networks playing an increasingly central role in the economy, steadily joining individual firms as a critical unit of analysis, it is perhaps inevitable that more and more breakthrough innovations (which often depend not solely on new capabilities, but also on novel recombination) will be driven by and through new ecosystems. Historically, many businesses have been reluctant to fully commit to shared discovery and invention processes, often wanting to guard their own “secret sauces” and avoid having to share the spoils of success. But the calculus for determining how and when to embrace more collaborative and open models for innovation is changing rapidly.

Ecosystems can be messy and fluid, and businesses do not yet have the equivalent tools for managing them, optimizing their output, and ensuring equitable rewards that we have developed over centuries for individual firms. But as specialist expertise and capabilities deepen, increase in importance, and become more expensive and harder to access, many firms are creating toolkits to support co-creativity and innovation ecosystems (such as Remake Learning’s open-source ecosystem playbook for education in Pittsburgh⁸⁹). **In the areas most highly prioritized for innovation, assembling or participating in such networks—including academia, suppliers, customers, government, and even fierce competitors—will be an extremely efficient and effective path to breakthroughs.**

Integrating investments across the short, medium, and long term

The shift toward innovation ecosystems and increased specialization have steadily ratcheted up the need for improved integration across our dynamic and multifaceted value-creation processes. For many businesses, this might require some recalibration of our sense of time, and greater integration across short, medium, and longer time horizons. For many years, mounting competitive, performance, and capital market pressures have encouraged an often relentless focus on the short term.

In times of discontinuous change, **it will serve businesses well to have a portfolio of investments and priorities better balanced across time—ensuring that short-term priorities and investments are directly informed by longer-term vision and create more robust levels of future optionality.**⁹⁰ Axiomatically, no portfolio can be **optimized** if one category is consistently **maximized**. The explicit adoption of multiple time horizons in planning, strategy, and innovation systems can help us navigate successfully through the discontinuities ahead—and inform our contributions to Sustainable Abundance.



The future of consumption... and persuasion?

Consumption

The future is always shrouded in uncertainty, and there remains today both reasonable doubt and disagreement regarding what the next few decades will bring. But three critical facts are clear. The first is that over recent centuries, our remarkable progress has created a modern world that bears very little resemblance to anything in history. Today's "normal" is, in fact, utterly without historical precedent or analog, and we are navigating through entirely unmapped terrain. The second is that the most critical driver of this progress has been accelerating scientific knowledge and the technologies it has birthed. And having played such a prominent role in creating our present, that same science is now issuing significant warnings about the sustainability of our future. The third is that in fewer than 100 years, we have created a very new and booming economy that is based primarily around consumption—directly fueled by increasingly sophisticated and powerful techniques of persuasion that are already becoming controversial.

Science and technology, along with globalization and entrepreneurship, have fundamentally reshaped our economies and societies, spreading progress, prosperity, and opportunity around most of the world. Billions of people enjoy significantly improved quality of life. Countless people in highly productive organizations have forged new discoveries, built new capabilities, created new value, designed new products and services, invented new logistics and systems, and identified novel ways to satisfy unmet (and often hitherto unidentified) human desires. Our collective ingenuity, talent, and energy have created a remarkable new world that nobody could have accurately foreseen even a few decades ago. But our successes have also created our new challenges.

For more than a century, hypotheses regarding the potential impact of human activity on Earth's climate—especially through the release of "greenhouse gases"—have been tested, iterated, and secured steadily growing, and now almost unanimous, scientific consensus. Over recent decades, they have been supported by more precise quantitative measurements and data regarding increasing swathes of our natural and climatic system, as well as by real-world climatic events and patterns. Today's increasingly sophisticated—though still far from perfect or complete—models are generating ranges of forecasts that are, to say the least, troubling.

Given the pace of change in recent history, this should not be surprising. Just 25 human generations ago, only about 350 million people shared our planet,⁹¹ and almost all of them lived at basic subsistence levels.⁹² No part of the world was meaningfully wealthier than any other; and only a vanishingly small number of people owned significant material possessions beyond the bare essentials.⁹³ As recently as 1900, the average American household still spent around 40% of its entire income on food and another 40% on the essentials of housing and clothing.⁹⁴

By the late 1950s, newly affluent middle-class Americans watching their recently acquired television sets enjoyed advertisements for an ever-expanding array of new consumer products—many specifically designed according to the freshly minted principle of “planned obsolescence” to ensure recurring purchases. Not coincidentally, in 1958, economist John Kenneth Galbraith pointed with prescient concern to “our gargantuan and growing appetite” to consume. He asked: “If it continues to grow, will it not one day have to be constrained?” before observing that “In the literature of the resource problem this is the forbidden question.”⁹⁵

For more than six decades, Galbraith’s question remained largely out of bounds—and it still defies a plausible and broadly acceptable answer today. But it is no longer “forbidden.” Galbraith’s own notion of “constraining” our consumption is not attractive; it smacks of authoritarian impositions, provides little hope for the 4 billion people still living all too close to bare subsistence levels, and threatens painful loss for billions more consumers—on every continent and in every country—whose standards of living remain very modest. But other movements to help inform the imperative changes ahead are gaining momentum.

Some highlight the limitations (and hazards) of GDP maximization as the primary driver of policy around most of the world (a purpose and use that the original creators of the metric very strongly cautioned against). A “degrowth” movement argues that not only must we limit economic growth but actively reverse it. Supporters of “green growth” argue that we can—and must—redesign our economies to generate continued growth in ways that ensure a safe and habitable planet. Alternative economic and business models are being proposed, and some are gaining currency—notably the carefully researched and finely articulated body of work by Kate Raworth that she terms “doughnut economics” and encourages new ways to bring supply, demand, and environment into greater harmony.

In very different ways and from very different (indeed, conflicting) perspectives, the various advocacy movements growing today can provide insights and approaches that contribute to the new innovation agenda already emerging to make the **supply** side of our economies much more sustainable. However, an equally important arena for new thinking and innovation clearly lies on the **demand** side.

While every individual has responsibility for their own consumption choices, deeper and more systematic issues are afoot. **Timeless human needs are currently entangled with temporary solutions that were built during and for an earlier industrial era and are decreasingly fit for our future.**

Human progress—our collective drive to create enhanced quality of life and greater opportunity to thrive for more and more people—has become inextricably linked to a model of **economic growth** created and measured in ways that were designed primarily over the past hundred years or so. Our elemental thirst for **accessible abundance** of what we most need, desire, and value has been met primarily by ever-burgeoning patterns of **consumption**. These growth and consumption models have served us very well as powerful proxies for our fundamental, biologically driven imperatives—and have entirely transformed human life for the better. They will continue to perform critical roles in organizing our economies and societies, but they must now be further evolved, as they do not ultimately optimize human well-being and fulfillment, generate too much waste, and are self-evidently unsustainable now.

A long and challenging process of redesign lies ahead—inevitably involving many stakeholders, substantial experimentation, and much debate. But it is necessary, and businesses have crucial roles to play.

The growth of the consumer economy in a nutshell

Two thousand years ago—only around 100 human generations—a vanishingly small minority of people enjoyed great abundance, while the overwhelming majority lived their (relatively short) lives at subsistence levels. Very, very few people, anywhere, owned significant material possessions beyond the essential basics.⁹⁶

Two Latin words from that time reflect a reality very different from ours today: *consumere* meant “to use up, waste, eat” and *luxuria* meant “excess and extravagance.” Neither word carried any positive connotations.

Following the Industrial Revolution, the availability of material goods and the opportunity to “consume” started to spread very slowly beyond the privileged few. This was accompanied by a shift toward a far more positive perception of consumption—first observed by Adam Smith, the “father of economics,” who declared that “consumption is the end purpose of all production” and described the acquisition of desired products “as a means to happiness.” Today these words seem obvious, perhaps even trite—but they were a radical departure from all prior orthodoxy and heralded a historic pivot.

By the early 20th century, a new and entirely unprecedented consumer-driven economy was proliferating—especially in the United States. A variety of innovations—including department stores, mail-order shopping, assembly-line production methods, affordable motor cars, and home electrification—together underpinned a profound reinvention of living standards.

An era of relative abundance for many (but still far from all) was dawning. Though severely interrupted in the 1930s by the Great Depression and then the horrors of World War II, this new consumer economy sprang back to life in the late 1940s, permanently changing US society—and the world.

The 1950s were an iconic inflection point, characterized by fast-spreading affluence and the emergence of a newly empowered American “middle class.” Secure, year-round, well-compensated work was in ready supply. Wartime production capacity was diverted to satisfy growing demand for all manner of consumer goods. Mass migration into suburbs was accompanied by the construction of shopping malls with plentiful parking. Driven largely by increased consuming power, the US economy boomed. Though the popular notion of “a chicken in every pot, an automobile in every garage” remained a far-off aspiration for many (more than one in five Americans still lived in poverty⁹⁷), by 1960 more than half of American households enjoyed the life-changing benefits of car ownership.⁹⁸ The consumer economy had been born.

The United States was the vanguard for the rise of the consumer economy, but it was not marching alone. Two countries devastated by defeat in WWII, Japan and Germany, led the way for Asia and Europe. Immediately after the war, Japan’s population urbanized rapidly, and its shattered industrial base was redesigned almost from scratch, focused on consumer products, and reengineered to simultaneously reduce cost and improve quality.

Enabled by new industrial policies and a focus on raising domestic income, GDP growth hit almost 10% by the mid-1950s,⁹⁹ and exports increased by an average 15% annually through the 1960s.¹⁰⁰ This success was the template largely followed by Singapore, Hong Kong, Taiwan, and South Korea as each built their own modern economies, and the consumer economy in Asia has since grown apace. Germany, the second-largest economy in the world before the war, was sliced in two when it ended, with its capital assets and productive infrastructure crushed. But policy reforms and a refocusing of investment onto civilian and consumer rather than military needs helped fuel the economy. Aided by the Marshall Plan, in the 1950s the German economy grew annually at 8%, leading Europe and overtaking the United Kingdom and France, while wage purchasing power increased by around 75%. The rapid rise of domestic consumption was central to the country’s resurgence, but it also invested heavily in exporting during this period, fueling the rise of the consumer economy around much of Western Europe.¹⁰¹

By 1970, the global economy was unrecognizable: Global trade was on a dramatic upswing, having reached 24% of global GDP. By 1990, it had soared to 39%. By 2008, it had reached 61%, accelerated by the demise of the Soviet Union and the (re)emergence of China as a central global economic actor. Cross-border trade has not increased since—but four decades of globalization proved enough to establish today’s burgeoning global consumer economy.¹⁰² And it is a wonder, transforming the lives of billions of people over the course of just three decades.

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Persuasion

It is often stated that customers have become increasingly empowered over recent decades—and it is certainly true that they have far greater choice and stronger muscles than they enjoyed historically. But so have businesses, through our dramatically growing power to influence, now reinforced by rapid growth of automated and unconscious consumption achieved through subscriptions and other business model innovations.

The art of selling—persuading others to desire and to buy something—is ancient, dating back to the earliest barter-based economies. But it is only over the past hundred years that it has become the beating heart of our economies. In the 1920s, a new and extremely effective “persuasion profession” was forged, explicitly built around the counterintuitive concept of “keeping the customer dissatisfied.” The foundations were laid by several extraordinary talents, notably Edward Bernays, a pioneer in the commercial use of propaganda¹⁰³ widely regarded as the father of modern public relations and a nephew of Sigmund Freud. Bernays sought to manipulate individual and mass psychology (for which he coined the term “the herd instinct”) to influence consumer behavior by appealing less to rational minds than to unconscious desires. This he described as the “engineering of consent,” giving business and political leaders the ability to “control and regiment the masses without their knowing about it.” Bernays spoke in remarkably blunt and direct language that very few business leaders would deploy today. But the practices he helped establish remain very actively used—and we have become far better at deploying them.

The profession launched by Bernays and others in the 1920s has expanded into a vast ecosystem comprising advertising, marketing, public relations, and communications. It has reached a breathtaking scale, now creating many millions of jobs, accounting for trillions of dollars, and providing the primary source of revenue for several of today’s largest companies. The sophistication and impact of its practices far exceed anything its originators envisaged.

Mass media—radio, television, and the internet—have continuously extended our **reach** to consumers, while social media has enabled highly precise targeting far beyond the capacities of mass broadcast technologies. Simultaneously, waves of scientific progress—notably in various behavioral sciences and neuroscience—have substantially strengthened our **ability to impact** consumer decision-making. Now an imminent explosion in neurotechnology (potentially providing us with an almost literal ability to “read the minds” of our customers)¹⁰⁴ alongside rapid growth of the scope and power of Generative AI will significantly amplify the ability to exert even greater influence.

Using our influence

With growing power comes growing responsibility. Influencing consumers to make purchases has always been, and will always be, a key driver of business. **But are we arriving at a stage in human progress at which business leaders might have to help answer Galbraith’s question, not by constraining the human appetite to consume, but by adopting greater focus and self-restraint in how we trigger and feed that appetite?**

We might have to. Societal norms and values are not fixed for all time—and over the past couple of decades they have been in considerable flux, calling some previously quite commonplace behaviors and practices into question. Many businesses have been responding through, for example, increased focus on diversity, equity, and inclusion (DEI) initiatives, regaining and securing trust, and addressing a broadening array of ethical issues. There are signs that the perceived line between acceptable influence and unacceptable manipulation¹⁰⁵ might also now be moving, giving rise to a further—and probably harder—shift for many businesses. For example, “fast fashion” has attracted considerable consumer-led criticism, and opposition is steadily mounting against the “clickbait” techniques adopted by some social media platforms and other companies.

But this did not start with the internet—it is foundational to most marketing techniques.

A very large proportion of our pleasure as consumers (often greater than the utility or aesthetic appreciation we derive from the goods themselves) lies both in the anticipation and the immediate experience of the simple **act** of purchasing something new itself—which floods our brains with dopamine.

As awareness grows of the extent to which the human brain’s limbic system is being triggered to increase our consumption, and the ability to deploy that power continues to grow dramatically, we should expect—and get ahead of—growing scrutiny of some of our current marketing techniques.

There is likely to be a generational dimension to the pushback ahead. We should be cautious here—it is easy to exaggerate fundamental, as opposed to age-stage, differences between generations. However, just as the millennial generation has had a very meaningful impact on our *organizations*, Gen Z appears poised to have a substantial impact on our *economies*. The later millennials were the first of the digital natives, while Gen Z is the first cohort to grow up under the mounting threat of climate change and experience firsthand the growing strength of networked power.¹⁰⁶ They are also the generation most fully exposed to the impacts of the steadily increasing costs and “share of wallet” demands of key fundamentals including housing, education, and health.¹⁰⁷

We are in a historic moment that requires significant transformation of much that we have come to take for granted regarding our lives, societies, economies, and work—and how we best continue to progress our constant journey toward true and satisfying abundance to replace life-threatening and limiting scarcity. We may also have a new generation better primed and more highly motivated to reimagine and reinvent our models of consumption than any that has preceded it—and perhaps more likely to resist our increasing powers to influence their purchasing choices. This generation can be a co-creative ally, as we add a critical dimension to our innovation agenda for Sustainable Abundance: a substantial overhaul of the ways we fuel and shape demand by focusing more precisely on the most fulfilling, sustainable—and, of course, profitable—goods and services that we are increasingly capable of creating.

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Individual businesses on their own cannot lay out the path toward Sustainable Abundance, and not all can even make highly significant and measurable contributions. Yet all can play a role in more specifically defining our collective perspectives on what this concept should entail and how our own efforts and actions over the coming decade will play a truly meaningful role in creating a better future. Large-scale changes are already arriving, and the forces that are driving them will continue to build. The question we each face is, therefore, the extent to which we wish to proactively help lead and shape that change or follow in the tracks of those who do so.

As we consider this choice, we should remember that committing to Sustainable Abundance is primarily an investment, not a cost. It will help lead to multiple innovations that drive rather than hinder growth and profitability for many businesses, all while fostering a more balanced perspective that aligns our interests across the short, medium, and long term. And to our collective advantage, it will also help sustain a relatively benign business environment of the sort that we may have taken for granted over recent decades but is currently far from guaranteed for the coming ones. **Indeed, the alternative to embracing Sustainable Abundance is unlikely to be a continuation of the status quo of steady growth but over time a probably inevitable journey toward economic and societal decline.**

Many generations of our ancestors, through their myriad remarkable achievements, bequeathed to us an enormous opportunity—the chance to further accelerate human progress. In taking up that task, we have much to be proud of. But now it is our turn to prove ourselves good ancestors by ensuring that those who follow have opportunities equal to or surpassing those we have enjoyed. Happily, we can do so, by embracing the better future—and better businesses—that can be secured by setting our sights today on Sustainable Abundance for tomorrow. The journey might not always be comfortable in the short term. But it will be well rewarded in the medium term and, probably, gratefully remembered in the longer term.

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