

Future Focus 2025

Pathways for Progress from the Network of Global Future Councils 2020–2022

INSIGHT REPORT
JUNE 2022

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Preface

The World Economic Forum Network of Global Future Councils promotes innovative thinking to shape a more inclusive, resilient and sustainable future. The network comprises nearly 1,000 top thinkers who provide foresight, generate insights and identify potential solution frameworks for the world's most pressing challenges.

This Insight Report shares the outcomes of multistakeholder dialogues organized by nearly 30 of the Global Future Councils of the 2020–2022 term between October 2021 and January 2022.¹ The dialogues engaged Council members to define interdisciplinary perspectives on a vision for 2025 in their domain area and to offer insights on the important transitions and the essential actions required to drive progress and achieve their vision.

Given the timing of these dialogues, the post-pandemic recovery occupies an important space in the Council visions. It is an inspiring agenda around which a sustainable recovery can be built and an important guide for the partnerships

and policies needed to address economic, environmental, social and technological challenges and opportunities through to 2025.

This report draws from and supports the Forum's platforms dedicated to catalysing a new economy and society, accelerating action for people and the planet, leveraging Fourth Industrial Revolution technologies, stewarding industry transformations and enhancing global and regional cooperation. These platforms and their stakeholders work with the Council experts and use the insights from this report to shape their agendas for tackling the world's greatest challenges and embedding greater resilience and cooperation.

Since early 2022, the world finds itself in a new geopolitical crisis. In such challenging times, it is imperative that the global community reflect on areas for cooperation and work towards an inclusive, resilient and sustainable future. It is hoped that these pages can provide a reminder of the opportunity space for collaboration and the pathways to get there.

Executive summary

The global economy has demonstrated significant resilience through the COVID-19 pandemic. Yet societies, the global economy and the planet face unprecedented challenges and disruptions that remain urgent and require an unprecedented transformation of the world's economic, environmental and social systems. This is evidenced by the recent geopolitical crisis that emerged not long after these Council visions were finalized in the spring of 2022. Such a shock is a reminder that while one crisis may be at the forefront at any given time, it is imperative that the global community remember to explore a wide variety of issues in the longer term to ensure the overall health of society and its readiness for the next change.

As compound global risks continue to evolve, setting a sustainable, inclusive growth agenda with clearly defined visions, pathways and partnerships will become the key to future prosperity. Given the interdependencies of global issues, nations and organizations cannot address them in isolation. Instead, they require effective public- and private-sector cooperation to set the ambition and address them in a more holistic way through partnerships and policy.

This Insight Report covers four thematic areas where important transitions and essential action are required to drive progress: the economy, environment, society and technology. It is not intended as a blueprint but rather as a framework around which a positive and inspiring agenda can be built.

Chapter 1 on economic matters looks at tools that policy-makers may deploy to build a more resilient, sustainable and inclusive economy, including fiscal and monetary policies, specific types of and strategies for investment, and resilience to global risks.

Chapter 2 on environmental matters proposes avenues, strategies and policy frameworks for advancing towards the net-zero transition by mid-century, seizing opportunities to foster cleaner air and clean electrification, to support the energy transition, to leverage nature-positive business practices and to nurture sustainable tourism.

Chapter 3 on social matters covers vital aspects of what a new social contract should embrace in relation to education and skills, equity and social justice, mental health and social cohesion, and work wages and job creation. It emphasizes avenues that will support the creation of more inclusive economic and social outcomes, human rights and the humanitarian and development needs of fragile communities.

Chapter 4 on technological matters explores how to harness technological advances for social progress, while supporting responsible and equitable transitions into the digital future. It highlights measures to design digital-ready policies, deploy and scale up frontier technologies for the benefit of people and the planet, and new opportunities for data commons and collaboration in scientific research and space.

Progress across these four areas holds the potential for achieving a sustainable and inclusive future. The visions for 2025 and the pathways proposed in this report are drawn from the insights of pre-eminent thought leaders in the World Economic Forum Network of Global Future Councils and are laid out for reflection and action by public- and private-sector decision-makers to drive much-needed progress.

A low-angle, upward-looking photograph of several tall, modern skyscrapers with glass facades. The buildings are arranged in a circular pattern, creating a sense of height and scale. The sky is a pale, overcast grey. Some windows are illuminated with warm yellow light, contrasting with the cool tones of the buildings and sky.

1 Economy

Economic growth and recovery

Bold government action can unleash private-sector initiatives to create new markets that will solve today's biggest challenges.

Governments will need to play a driving role in orienting markets towards this transformation. The goal in several industries is to develop and mainstream a new set of products, services and business models that provide solutions to the problems that societies face today.²

- **Increased inequality.** The distribution of wealth and income has become unsustainably unequal over past decades, leading to social tensions and polarization and decreasing economic resilience in many countries.
- **Climate change and environmental degradation.** In spite of the increased efficiency

of many technologies and business models, the current economic and socio-technical systems remain environmentally unsustainable.

- **Health crises.** COVID-19 has highlighted the importance of the timely development of, and open access to, new medical solutions to address both new and existing health crises.

The response to the COVID-19 pandemic represents one of the pivotal moments in history when radical change is possible, and societies have been forced to question existing paradigms. Similar moments in the past enabled governments to lay new foundations for long-term, shared prosperity.³



Vision 2025

Economic transformation will depend on creating new, inclusive and sustainable markets. The development of new niches into scaled markets goes through three main phases: 1) design, research and development; 2) demonstration and experiments; and 3) market scale-up. The first phase can be focused on creating new institutional and societal models as much as new products, technologies and business models. This process must be cyclical and generative, with demonstrations and markets feeding back to further design and development for the healthy evolution of the ecosystem.⁴

Accelerating progress in these three phases of market creation requires a new vision of how the public and private sectors can work together to drive economic transformation.

“ A new narrative on the role of the public sector is needed, away from that of burdensome bureaucracy to one of market co-creator.

Unleashing private-sector initiative

Over the past few decades, many advanced economies have progressively disinvested in the capabilities of their public sector. The debate

about the role of government in the economy remains focused on how big it should be rather than on how bold. A new narrative on the role of the public sector is needed, away from that of burdensome bureaucracy to one of market co-creator. This will in turn make public employment more attractive to the right type of talent.⁵

Only the combined efforts of the public and private sectors will be able to transform techno-economic paradigms and bring better and broader growth. Yet public-private partnerships around innovation and market creation have often been too unbalanced, and the benefits of successful projects have not been fairly distributed within the population.⁶

Innovation in governance has been slower than innovation in technology and business models. Addressing the growing tension between techno-economic systems – the way economic value is produced and the incentives that shape markets – and institutions – the set of values, formal and informal rules and beliefs shared in communities – will be key for building stronger public-private partnerships.⁷



Turning today's challenges into the markets of tomorrow

Today's economic transformation builds on the scientific and technological developments of years past. Only a patient approach to innovation financing can deliver a continuous pipeline of new discoveries that can shape tomorrow's markets in the direction needed, protecting people and the planet.

With the need to provide for a long-term pipeline of R&D comes the tremendous opportunity to accelerate the uptake across different contexts, sectors and geographies of products and technologies that are already mature. In all sectors,

declining competition levels could prevent the incumbents from effectively positioning themselves in the most promising new markets. It is important to look at the political economy behind the choice of the innovation pathways: while government support is vital, it is too often co-opted to serve incumbent sectors.

The creation of new markets often requires a parallel approach on supply and demand. New products might struggle to find a space in the market even when they present superior characteristics, especially if they represent a transformation in complementary know-how, infrastructure and other sunk costs. Governments can support the demand for key products, but transformative change often requires a change in behaviour by entire communities, and a coordinated shift by actors, regimes and institutions.⁸



Pathways to Vision 2025

Investing within public administrations to develop dynamic capabilities and capacity

Strategies for operationalizing this pathway include:⁹

- **Encourage a new approach to public administration.** This encouragement can be, for example, supporting an approach based on experimentation and learning-by-doing.
- **Establish new norms of sharing rewards and develop skills in the public sector.** Adopting norms in terms of portfolio-setting and risk-taking, coherently and with an approach to public investment as the investment of first resort, is needed.
- **Design new metrics to evaluate public investments.** This involves capturing the dynamic spillovers that occur with bold policies, which are hard to capture with static cost–benefit and net present value analyses.
- **Limit the outsourcing of key capabilities.** Ramping up investment within the public sector will enable it to become more capable and develop “absorptive capacity”.

Building symbiotic public-private partnerships

Strategies for operationalizing this pathway include:¹⁰

- **Introduce conditionalities for public investments, subsidies, guarantees and bailouts.** Shifting practices and behaviours within companies towards lower carbon emissions, better working conditions and fewer share buybacks is central.

- **Establish a new legal blueprint for patents and other IP.** The need is to balance private incentives and public interest for transparency and the diffusion of knowledge.
- **Rebalance risks and rewards.** One way is to focus on specific cases where the government provides support for research, for example through equity stakes or golden shares of IP rights.
- **Develop initiatives that can diffuse knowledge and IP.** Specific challenges can be addressed through pools, pledges or mandatory licensing.
- **Increase scrutiny of anti-competitive practices.** It is important, most notably, to address patent trolls through dedicated legislation and changes in the breadth of coverage granted to IP.

Rethinking value

Strategies for operationalizing this pathway include:¹¹

- **Scale hybrid methodologies for innovation.** For example, social impact ventures, which better align economic and societal value, embed a different approach to governance and transparency.
- **Adapt the measurement and accounting frameworks used to account for economic value.** This can be done at both the micro and macro levels by assigning a proper value to parts of the economy in which prices do not fully reflect their economic and societal contribution.
- **Pilot new solutions and public-private governance models.** This entails embedding societal values in the development of new technologies and business models.

“ Shifting practices and behaviours within companies towards lower carbon emissions, better working conditions and fewer share buybacks is central.

Increasing patient investment in mission-driven research

Strategies for operationalizing this pathway include:¹²

- **Set up dedicated vehicles through public funding.** Examples include national investment banks or innovation funds specialized in the provision of long-term funding (10-plus years).
- **Create urgency on missions of vital importance in the long term.** A good place to start is by ensuring that governments, businesses and civil society agree on the statement of a problem, and highlighting the fundamental threat it might pose to society and developing a clear plan.
- **Rewire private investments.** This involves building on the growing success of environmental, social and governance (ESG) principles and embedding patience much more strongly in the incentive mechanisms that drive the decisions of funds and investors, throughout the full spectrum that includes venture capitalists and philanthropists.
- **Strengthen available metrics.** This includes adding qualitative dimensions, such as the time horizon of R&D projects, to existing indicators in ESG standards and national statistics.

Scaling up the production of goods, services and technologies of tomorrow

Strategies for operationalizing this pathway include:¹³

- **Strengthen supply.** Subsidies, capital grants, government loans and other tools can help new entrants and trigger economies of scale.
- **Target specific market niches that can help address future challenges.** It is important

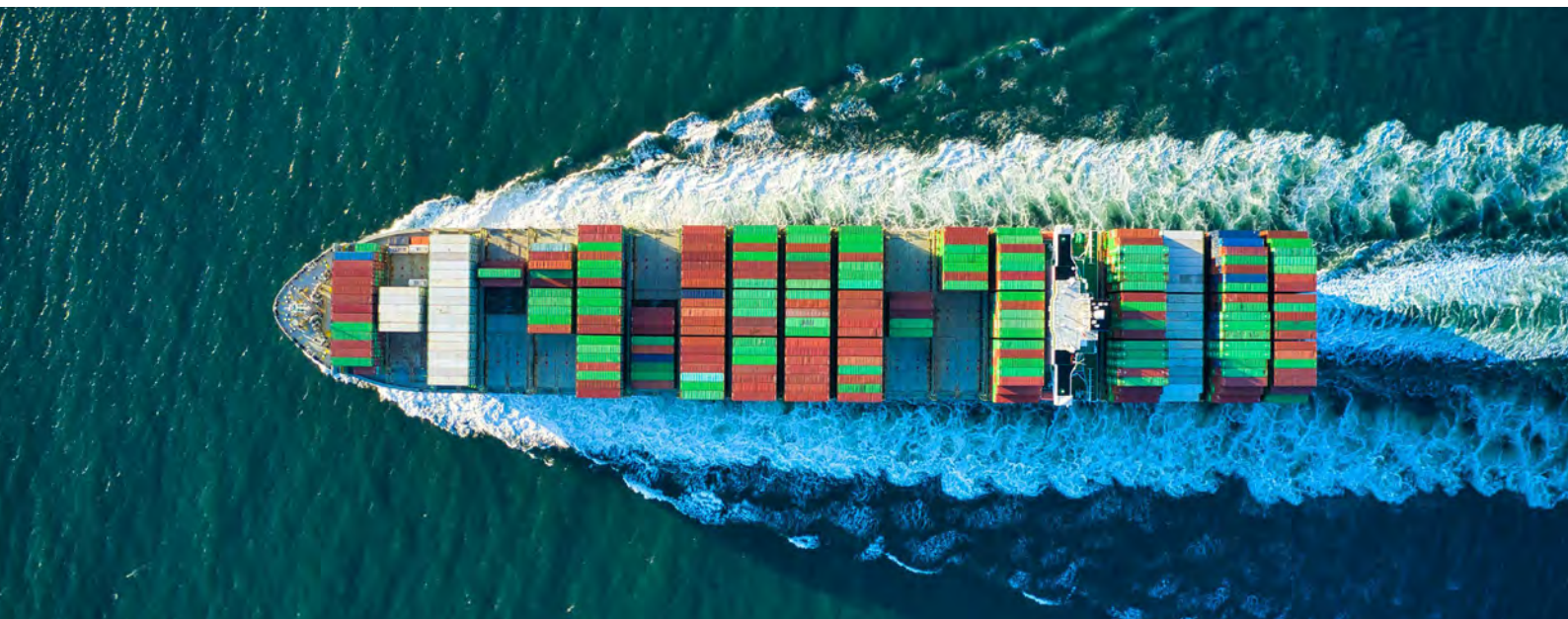
to prioritize those that do not get attention from current investors and industries.

- **Shift government support.** That support should move from incumbent players and sectors to new entrants.
- **Encourage partnerships among businesses, including small and medium-sized enterprises (SMEs).** One means is to create alignment on common production and innovation challenges, pool knowledge and diffuse benefits.
- **Use demonstration effects.** Possibilities include inspiring local producers and helping localize global solutions through pilots and prototypes.

Co-creating demand

Strategies for operationalizing this pathway include:¹⁴

- **Change relative prices.** This is possible, for example, through taxes, subsidies or other forms of economic incentives.
- **Ensure initial market demand.** This can occur, for example, through public procurement, public works or other forms of direct public spending.
- **Align leading stakeholders, most importantly governments.** Building consensus on politically feasible solutions that are a win-win within the broader ecosystem is key.
- **Work with communities to co-shape the broader techno-economic system.** Efforts can influence their behaviours, preferences and perceptions.
- **Establish clear KPIs and rigorous assessment.** Assessing the relative performance of goods and services brought to the market is critical.



Fiscal and monetary policy

Public spending will need to become more pro-poor and provide the necessary public goods for sustainable inclusive growth.



Pandemic-induced lockdowns and the ensuing global recession have created a highly uncertain global outlook. Policy-makers are challenged to recalibrate their priorities and restructure their support by designing the right environment to shape fairer, more inclusive and sustainable economies and societies.¹⁵

Three main trends are shaping the global agenda for fiscal and monetary policy:

- **Widening inequalities and divergent recoveries.** Pandemic-induced lockdowns and divergent recoveries on the back of uneven vaccination coverage have created a highly uncertain and uneven global outlook. Globalization is stalling, social capital is eroded by increasing inequality and political polarization, and the still-unfolding economic crisis is threatening the livelihoods of billions of people.¹⁶ Close to 95 million more people are estimated to have fallen below the threshold of extreme poverty in 2020 compared with pre-pandemic projections, reversing a two-decade-long trend of global poverty reduction.¹⁷
- **Growing public- and private-sector debt.** The rapid build-up of debt across many economies is among the key challenges policy-makers face as they look ahead to the post-pandemic economy. With higher debt levels, small increases in interest rates can have a lasting impact on their fiscal sustainability, while also mechanically reducing the fiscal leeway to respond to future crises.
- **Intensifying climate imperative.** According to recent IMF estimates, GHG emissions are still projected to rise by about 20% by 2030 under the most conservative scenario.¹⁸ Among all the announced fiscal packages since the beginning of the pandemic, only a limited share was allocated to climate-positive measures. The global net climate impact of these measures remains negative.¹⁹ Although several economies have already implemented or are scheduled to implement carbon pricing initiatives, these initiatives only account for 22.3% of the estimated global GHGs.²⁰



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Building back broader

High inequality within and across countries was already a major challenge before the pandemic – a trend exacerbated by the pandemic. Despite extraordinary policy support, the employment and earnings effects of the pandemic have been highly unequal, disproportionately affecting disadvantaged populations. Furthermore, the low coverage of existing social insurance systems is still a significant obstacle that prevents the prompt provision of lifelines to households that are most in need.

Public spending will need to become more pro-poor and provide the necessary public goods for sustainable inclusive growth. In the near term, international cooperation, including financial support, is also crucial to ensure that vaccines, treatments and medical supplies are distributed quickly and fairly across all countries.²¹ The uneven access to vaccines and limited ability to mount an appropriate policy response are setting back the development prospects of lower-income countries.

Transforming local and global tax architecture

By designing more progressive taxation mechanisms, the tax burden can be shifted from the bottom to the top and provide a higher tax base for revenue mobilization (especially in countries with lower tax capacity) and contribute to financing social spending and structural reform.²² People and households on lower incomes should not be removed from the tax system, however, since inclusion here is linked to political citizenship

through the social contract, which is crucial to the long-term accountability of governments.²³

Tax systems need to be redesigned to achieve more efficient taxation on capital, in part to level the playing field for smaller businesses and to rein in monopoly power. International coordination on tax matters is needed now more than ever, especially to deal with pressing challenges regarding the taxation of multinational enterprises and tax evasion by individuals using offshore accounts. The highest priority in international tax coordination is with respect to climate change – where global externalities have drastic consequences.

Rethinking the division of labour between fiscal and monetary policy

The current economic downturn raises questions about the division of labour between monetary and fiscal policies. A fundamental reassessment of the scope and roles of fiscal and monetary policy is required. The new framework needs to enhance coordination between different policy tools during recessions as well as recoveries. This implies that, when fiscal space is available, fiscal policy will need to play a greater role in supporting the economy while ensuring independent monetary policy to anchor inflation expectations during periods of rising inflation. Furthermore, despite the effectiveness of current monetary policy tools in maintaining liquidity and stability, monetary policy alone cannot bring in the necessary structural transformations to build fairer, more equitable and sustainable economies.²⁴

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Pathways to Vision 2025

“Expanding coverage of access to automatic stabilizers in the social insurance systems should be a key goal of social protection reforms in the future.”

Strengthening automatic stabilizers and safety nets

Strategies for operationalizing this pathway include:

- **Broaden the coverage of formal social insurance.** Between March 2020 and May 2021, over 3,330 social protection measures were planned or implemented in 222 countries or territories.²⁵ Wage subsidies, cash transfers, training measures or extending coverage of unemployment benefits have all been crucial tools to protect the most vulnerable populations during the pandemic. Of this spectrum, social insurance and automatic stabilizers have several advantages,²⁶ protecting families from the shock and supporting aggregate consumption. However, currently a mere 30.6% of the working-age population is legally covered by comprehensive social security system benefits.²⁷ Thus, expanding coverage of access to automatic stabilizers in the social insurance systems should be a key goal of social protection reforms in the future.
- **Expand the use of adaptive social protection mechanisms.** Given the low coverage of automatic stabilizers especially in low- and middle-income countries, many families will not be able to rely on them for the foreseeable future, hence the importance of introducing social protection mechanisms that adapt to the nature of systemic shocks so that they can enhance the capacity to prepare, cope with and adapt to future shocks.²⁸ Targeted cash transfer programmes tend to have the most significant effect of all social assistance programmes in reducing poverty and can improve human capital accumulation and help households to smooth out income shocks, reducing future inequality.²⁹

Investing in human capital and fostering social mobility

Strategies for operationalizing this pathway include:

- **Bridge the education and skills gap.** UNICEF reports that schoolchildren worldwide have lost an estimated 1.8 trillion hours of in-person learning due to COVID-19 lockdowns.³⁰ According to the International Monetary Fund (IMF), “Learning losses [are] especially large in emerging market and developing economies and for children from poorer families and rural areas lacking access to digital infrastructure.”³¹ Unless forceful remedial actions are put in place, the pandemic could result in a brutal reversal of past gains. Improving education access, digital infrastructure and early childhood development will be crucial to ensure individuals have more equal opportunities to acquire skills and improve social mobility. Also according to the IMF, “Tax policy can affect incentives for human capital investment, especially in one’s children. Particularly in countries with more developed tax systems, child tax credits to lower-income households can have large effects on children’s school attendance, performance and future earnings.”³²
- **Support lifelong learning initiatives.** The public sector needs to increase support for the reskilling and upskilling of at-risk or displaced workers in the midst of job transitions. Workers must urgently be encouraged to develop their skills throughout their career while the public sector must decisively tackle long-delayed improvements to education and training systems.³³





“ Stimulus programmes should focus on measures such as tax incentives and investments in low-carbon, energy efficient infrastructures, green R&D and climate-smart technologies.

Embedding environmental sustainability in policy-making

Strategies for operationalizing this pathway include:

- **Reduce long-term support to carbon-intensive industries.** Stimulus programmes should focus on measures such as tax incentives and investments in low-carbon, energy efficient infrastructures, green R&D and climate-smart technologies.³⁴ Facilitating a green economic transformation will also entail a shift of workers away from carbon-intensive and environmentally destructive production processes and towards jobs that help reduce GHG emissions and improve environmental sustainability.³⁵
- **Create new multilateral decarbonization frameworks.** A framework that supports the adoption of decarbonization tools such as national emission trading systems and carbon taxes needs to be created. An international carbon tax price floor would serve as a reinforcing mechanism of near-term mitigation action, complementing the Paris Agreement.³⁶

Creating progressive, efficient and fairer fiscal systems

Strategies for operationalizing this pathway include:

- **Improve the progressivity fiscal mechanisms.** These include increasing top marginal income and capital gains tax rates, which have declined in recent decades,³⁷ and reforming tax deductions that predominantly benefit higher incomes. Inheritance/gift taxes and property taxation should also be considered. The introduction or expansion of value-added taxes should be treated with caution. Although it can effectively raise revenues from domestic consumption, it is important to ensure direct transfers are in place to counterbalance the negative impact that higher consumption taxes will have on the poor.³⁸
- **Transform the global corporate tax architecture.** A leap forward was made in the recent multilateral OECD/G20 agreement on corporate taxation, but further progress is possible on fairness and the effectiveness of this agreement. Lower-income countries will continue to lose the greatest share of their current tax revenues to corporate tax abuse³⁹ and close to \$483 billion in tax revenues are still lost every year to global tax abuse.⁴⁰ The IMF and the UN have recommended a focus on an additional “solidarity tax”, in which revenue-raising is targeted on the wealth of the most affluent and excess profit taxes on those that have prospered during the pandemic.⁴¹

Investing

By 2025, sustainability will truly be at the heart of capital allocation and future investment portfolios.



Investors are stewards of the world's capital and are key in shaping a more long-term and sustainable global economy. Institutional investors, such as pension and sovereign wealth funds as well as asset managers and private equity firms, influence their investees through active ownership, including engagement and voting, in addition to making decisions about how capital is allocated.

Climate change, widening inequality and social unrest are shifting the priorities of the investment industry. As the concept of stakeholder capitalism has gained endorsements from the Business Roundtable, academics and policy-makers, several trends have amplified the need for responsible and sustainable investment:

- **Rethinking risks and opportunities.** COVID-19 has highlighted the fragility of economic, environmental and social systems. Investors today need to manage 21st-century business risk and opportunity.⁴² This includes considering systemic changes,

such as climate change, cybersecurity, pandemics and widening inequalities.

- **Greening the economy.** The investment industry has the scale and influence to support global efforts to limit climate change and drive the transition to net zero. As global pressure mounts to slash emissions, the investment industry is pushing for greater disclosure on carbon and investing to decarbonize operations. There are also significant opportunities to capitalize on the push for sustainable growth.
- **Increasing ESG reporting.** ESG issues have become the main theme of corporate reporting and investor concerns.⁴³ Pressure to consolidate and align ESG metrics and approaches culminated in the recent formation of the International Sustainability Standards Board during COP26. Non-traditional reporting will continue to be high on the agenda for global regulators.

“ Greenwashing has emerged as a top challenge as sustainable investing becomes mainstream.

Vision 2025

Incorporating sustainability

Sustainability issues represent a material risk to investors and financial markets, and climate change is high on the agenda for all industries. By 2025, sustainability will truly be at the heart of capital allocation and future investment portfolios. Recent estimates of the value of sustainability-themed products put the industry at \$3.2 trillion in 2020, up more than 80% from 2019.⁴⁴ This is made up of sustainable funds, green bonds, social bonds and mixed-sustainability bonds.

Action on net-zero commitments:

- Despite several net-zero commitments and industry alliances, solutions are needed to develop innovative financing approaches and de-risking measures, including risk sharing by stakeholders across the investment ecosystem, policy-makers and multilateral development banks.

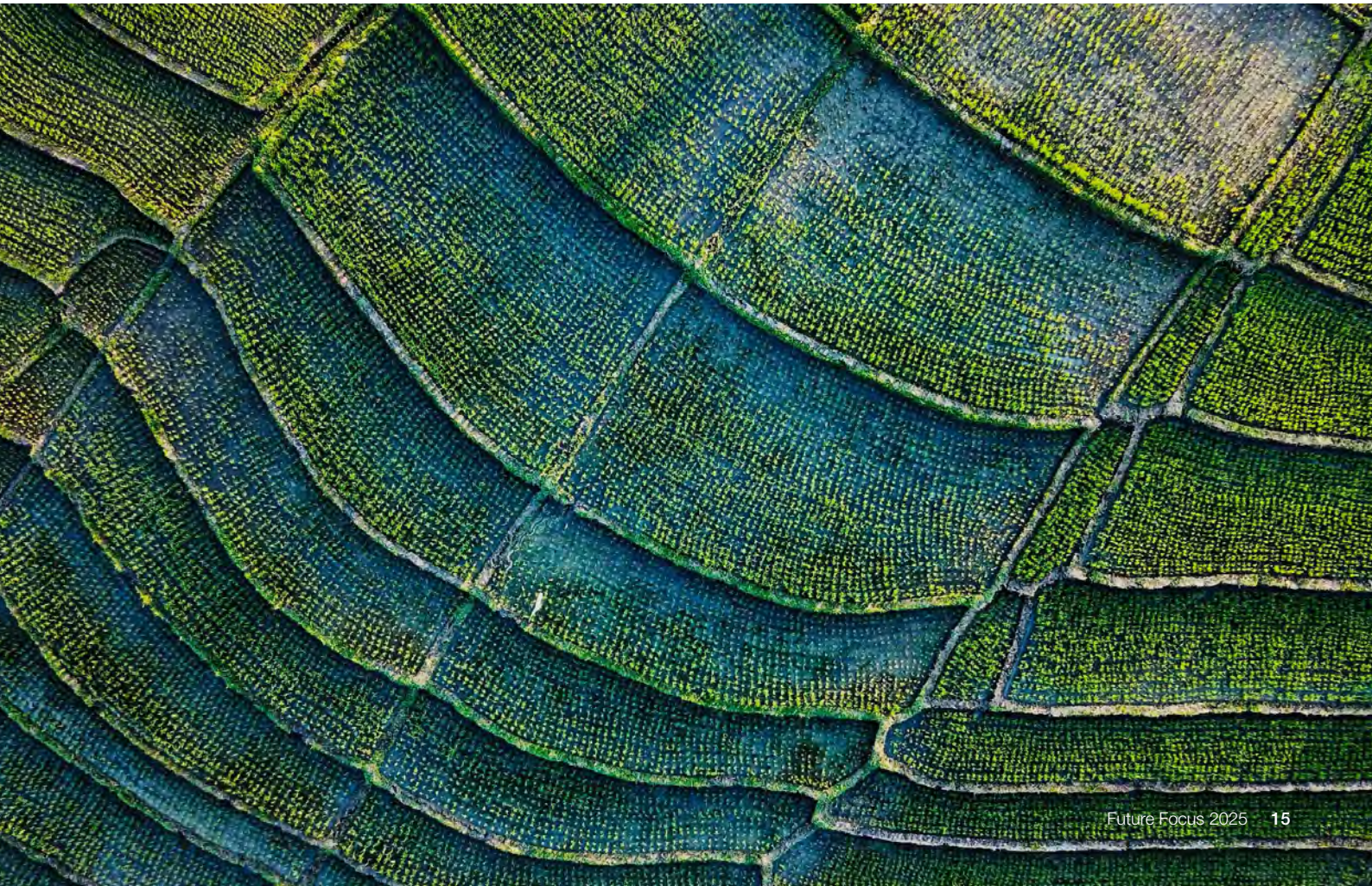
Full integration of ESG:

- Investors are increasingly committing to integrating ESG considerations in their processes. As at 2021, 4,000 investors representing \$110 trillion in assets under management are signatories to the Principles for Responsible Investing.⁴⁵

- ESG means different things to different investors, however, creating confusion in the marketplace and making it difficult for investors to align their values and investments.

Greenwashing concerns:

- Greenwashing is a process of providing misleading information about sustainability performance, mostly due to the lack of a clear, agreed definition.
- The lack of consistent and comparable ESG reporting and rankings allows companies to cherry-pick the most flattering ratings, while their sustainability-related claims and commitments remain unchecked or unsubstantiated. A recent study by the International Consumer Protection Enforcement Network found that roughly 40% of environmental claims made by companies could be misleading.⁴⁶ These greenwashing concerns affect the accuracy and depth of insight as investors make capital allocation decisions. On the flip side, companies may be reticent to share information for fear it could be taken out of context or used against them.
- Greenwashing concerns related to sustainability-linked financial products also exist. For institutional investors in particular, greenwashing has emerged as a top challenge as sustainable investing becomes mainstream.⁴⁷



Improving transparency from investors, regulators and companies

ESG reporting is in its infancy compared to traditional financial reporting, and an accurate assessment is hampered by a plethora of overlapping standards, resulting in a lack of consistent and comparable reporting. For asset owners and managers who expect to be able to undertake a comprehensive analysis of company financial and non-financial performance, this means that there is no comparable and consistent information across a portfolio. The establishment of the International Sustainability Standards Board at COP26 aims to address this friction, but this takes time and uptake is voluntary.

According to the United Nations Conference on Trade and Development (UNCTAD), “sustainability performance and ratings have expanded from company disclosure to an emphasis on fund disclosure by asset owners, such as pension funds.”⁴⁸ This has increased the pressure on investors to report on their own ESG progress as well as commit to improved transparency and progress on diversity, equity and inclusion within the industry and in how capital is allocated.

Regulators and policy-makers are also looking closely at transparency in financial markets, particularly as it relates to ESG corporate reporting and scrutiny of ESG-related financial products.



Operating in an environment of growing private assets and the democratization of markets

Public markets have historically driven massive economic growth, job creation, innovation and personal wealth-building. Therefore concerns have been raised recently that corporations and investors are favouring raising funds via private markets.⁴⁹ Initial public offerings and the number of public firms have declined, while the number of firms staying private longer has risen. This trend is likely to continue, with private markets predicted to make up 10% of global assets under management by 2025, serving as an important engine of economic growth.⁵⁰

Private markets do not offer the same level of transparency as public markets and are less liquid, providing limited opportunities to exit on a timely basis. This makes the selection of managers very important – an issue that is explored by the World Economic Forum Global Future Council on Investing.⁵¹ It also limits the choices of retail investors and their ability to invest in some of the world's fastest growing (but private) enterprises. Although many risks are associated with investing in privately-held firms, such as uncertainty, information asymmetry, less liquidity and lower regulatory oversight, the popularity of private investing continues to rise.



“ Integrating sustainability goes well beyond principles and reporting; it affects how investors price and think about risk, and requires investors to rethink the traditional risk and return trade-off.

Pathways to Vision 2025

Integrating a responsible investment approach

Although momentum is building, the shift to fully integrate sustainability into investment processes will take time. To do this in a way that is consistent will also require significant effort.

Strategies for operationalizing this pathway include:

- **Be active stewards.** Stewardship and ESG integration are complementary strategies that can enhance decision-making.⁵² Investors view active ownership as an important lever for generating sustainable financial returns, and a way to shape investees’ business practices. Investors need to play an active role in fostering good governance policies and practices throughout their portfolios.
- **Address reporting inconsistencies.** Without consistent data it is difficult for investors to accurately assess and compare approaches to sustainability and performance. The World Economic Forum-led Stakeholder Capitalism Metrics work is creating a common baseline for corporate sustainability reporting.⁵³ The establishment of the International Sustainability Standards Board is an important step forward.

- **Create sustainable value creation through private equity.** Due to the growing importance of private assets, private equity is poised to drive sustainability because it is positioned to drive business transformation and align shareholders, management and stakeholder communities to deliver a step-change in accelerating sustainable value creation and adopt ESG practices. In a similar vein to public markets, the alignment of asset owner and private equity manager expectations when it comes to sustainability is needed. Through its work, the Global Future Council on Investing has highlighted the role private equity can play related to driving sustainable value creation.
- **Scale investment in sustainable solutions.** Integrating sustainability goes well beyond principles and reporting; it affects how investors price and think about risk, and requires investors to rethink the traditional risk and return trade-off. Practical examples of how investors tackle environmental problems are needed. The Global Future Council on Investing has highlighted challenges in financing forest conservation⁵⁴ and in natural capital.⁵⁵

“Focusing the sustainability lens inward will allow investors to better anticipate and adapt to new risks and opportunities in the years ahead.”

“Walking the talk” on sustainability and diversity, equity and inclusion

Investors must instill a sustainability mindset when it comes to investment approaches, but it is also equally as important that they “walk the talk” on their own reporting and efforts to improve diversity, equity and inclusion (DE&I).

Strategies for operationalizing this pathway include:

- **Report on own ESG performance.** A majority of institutional investors look for information on sustainability issues “to better assess companies’ adaptability and resilience and monitor their risk management to inform investment decision-making and votes ... Focusing the sustainability lens inward will allow investors to better anticipate and adapt to new risks and opportunities in the years ahead.”⁵⁶ The audience for these metrics will vary by organization; in some cases, those audiences may be internal or supervisory, or represent the broader public. The Global Future Council on Investing paper entitled “Adapting Corporate Sustainable Value Creation Indicators for Investors” details the case for investors to disclose non-traditional metrics and offers a summary of priority ESG metrics.⁵⁷
- **Improve DE&I.** The business case for prioritizing DE&I in the workplace has never been stronger: a DE&I culture attracts and retains the best talent, leading to a competitive advantage. Companies are also more likely to have a deeper understanding of their clients and can evolve better to meet changing client demands and needs.

More comprehensive strategies are needed to ensure bottom-up action by investors to improve DE&I. This includes diagnosing talent flow issues using data, documenting commitments across DE&I, soliciting leaders to make personal commitments and taking action to track and report on progress.^{58,59}

Tackling greenwashing

As sustainability has reached the top of board agendas, so too has the risk of greenwashing. For investors, greenwashing risks exist at an investee level but also at a financial product level. Some regulators are taking aim at investment firms that mislead the public and institutional investors about the sustainability credentials of their products and make misleading or erroneous claims.

Strategies for progressing along this pathway include:

- **Standardize what makes a “sustainable” investment.** The CFA institute found that “78% of practitioners surveyed believe there is a need for improved standards around ESG products to mitigate ‘greenwashing’” when it comes to financial products.⁶⁰
- **Instigate greater financial innovation.** Financial innovations, including green bonds, green loans and sustainability linked loans, have grown in the past few years, but innovation opportunities exist in financial instruments and business models can create impact and be implemented at scale.⁶¹
- **Improve public-private cooperation.** An industry movement, working with government policy, will transform markets more drastically than is currently being observed.⁶²



Responsive financial systems

The global financial system is playing an important role in enabling the ongoing economic recovery and financing the transition to a net-zero economy.



The global financial system is playing an important role in the ongoing economic recovery and in closing the net-zero funding gap to decarbonize economies and transform industries. However, financiers and policy-makers are facing a changed macro environment affected by disruption from the COVID-19 pandemic, international conflicts, innovation, climate change and social inequality.

Six themes retain the attention of policy-makers and financial leaders:⁶³

- **Digital-led recovery.** Digital payments and e-commerce are reshaping the agenda for small businesses, financial inclusion and the future of money. While the pandemic accelerated digital transformation, it also made addressing digital exclusion more urgent.
- **Green transition.** Finance plays a pivotal role in facilitating the transition to a net-zero economy, and innovative approaches are needed to bridge the net-zero funding gap.
- **Finance reconstructed.** Innovation is enabling new firms, partnerships and interlinkages, leading to a different financial architecture.
- **Quantitative easing infinity.** The US Federal Reserve System's distorted discount rates and new fiscal paradigms raise new questions for monetary policy.
- **Regulatory toolkit.** Unconventional tools, new questions and unintended consequences require innovative policy thinking. New digital forms of money, such as crypto assets, stablecoins and central bank digital currencies, pose a range of opportunities and challenges to regulators.
- **Transformed world.** Deglobalization, divergence, inequality and scarring from the pandemic pose a new set of problems.

Collaborative efforts and innovative solutions must be built by existing and emerging financial actors. To succeed, this shift requires policy leadership, a reconstituted regulatory framework and a fit-for-purpose governance framework to guide a safe and smooth transition into a green and digitalized economy.



“ By 2025, investors will play a larger role in financing the innovation that will be key to reach the long-term 2050 net-zero targets.

Vision 2025

Today's global financial system needs to evolve to proactively respond to the needs of pandemic-battered economies, thereby ultimately moving into an inclusive, sustainable and equitable net-zero future society.

Financing the green transition

The transition to a lower-carbon economy requires a large rewiring of the global economy, with some \$3.5 trillion of investment needed annually “for decades”.⁶⁴ The shift to net zero will depend on a policy framework and companies and investors also seizing the opportunities and navigating the risks of a complex transition. By 2025, investors will play a larger role in financing the innovation that will be key to reach the long-term 2050 net-zero targets. This new phase of climate-aligned investing will include “comparable metrics on carbon footprints, throughout the entire value chain and across a whole portfolio”.⁶⁵ In the long run, this will facilitate greater climate engagement and activism.

Building an inclusive financial ecosystem

Digital transformation offers the opportunity to achieve a digitally and financially inclusive economy. As digital innovations continue to connect economies and supply chains, a fit-for-purpose regulatory approach with new laws for data sharing is created with appropriate safeguards for privacy and security at an industrial scale, ensuring cybersecurity and the integrity of the global financial system.

Moreover, the new financial ecosystem becomes digital and data-driven to support a smooth energy transition and to address the challenges of inadequately servicing SMEs and lower-income cohorts, putting inclusion as its core mission. As has been pointed out, “Digital service providers must find more innovative ways to educate their customers about the products they are offering and provide them with continued education as individuals become more sophisticated in their use of investment products”.⁶⁶ Effective digital infrastructure and payment processes benefit poor communities and also open the door to the global marketplace for small businesses.

Addressing governance issues in a digital age

As Central Bank Digital Currencies (CBDCs) gain momentum around the globe, several questions emerge regarding design characteristics and feasibility. Among the various debates discussed between practitioners, policy-makers and regulators, the issue of governance is perennially difficult and one that will have a significant effect on the feasibility and usefulness of any potential initiative.

With the dawn of the age of digital money, by 2025 common standards and approaches are shared to widen access and ensure that everyone can join the digitization journey. The need for autonomy and the increasing modularity of digital networks in finance demands a layered approach to governance, aiming to promote innovation, competition and inclusion. Regulators work alongside technology experts, local enforcement and intergovernmental actors to design forward-thinking laws that keep track of rapid developments in the digital age.

Pathways to Vision 2025

Accelerating the green transition

Strategies for operationalizing this pathway include:

- **Adhere to new high-quality sustainability disclosure standards.** With countries and blocs seeking differing sustainability standards, international bodies like the International Sustainability Standards Board are important to shape globally aligned sustainable finance disclosures. Innovation by data companies and corporates on tracking carbon footprints, however, will also be key. Corresponding changes in investor behaviour involve or entail a shift in focus to a more bottom-up approach to how individual businesses can abate their carbon footprint from a top-down view of the overall sector (Figure 1).⁶⁷
- **Reform development banks to channel and leverage finance to emerging markets.** Development banks provided \$66 billion of green finance in 2020 and this could be multiplied to turbocharge clean-energy technology investment.⁶⁸ Whether through capital increases for the key development banks, simpler and smarter public-private partnerships, or

changing the capital frameworks and bank mandates, it is critical these institutions do more. A constructive debate is needed about leveraging balance sheets to support innovation and the green transition.

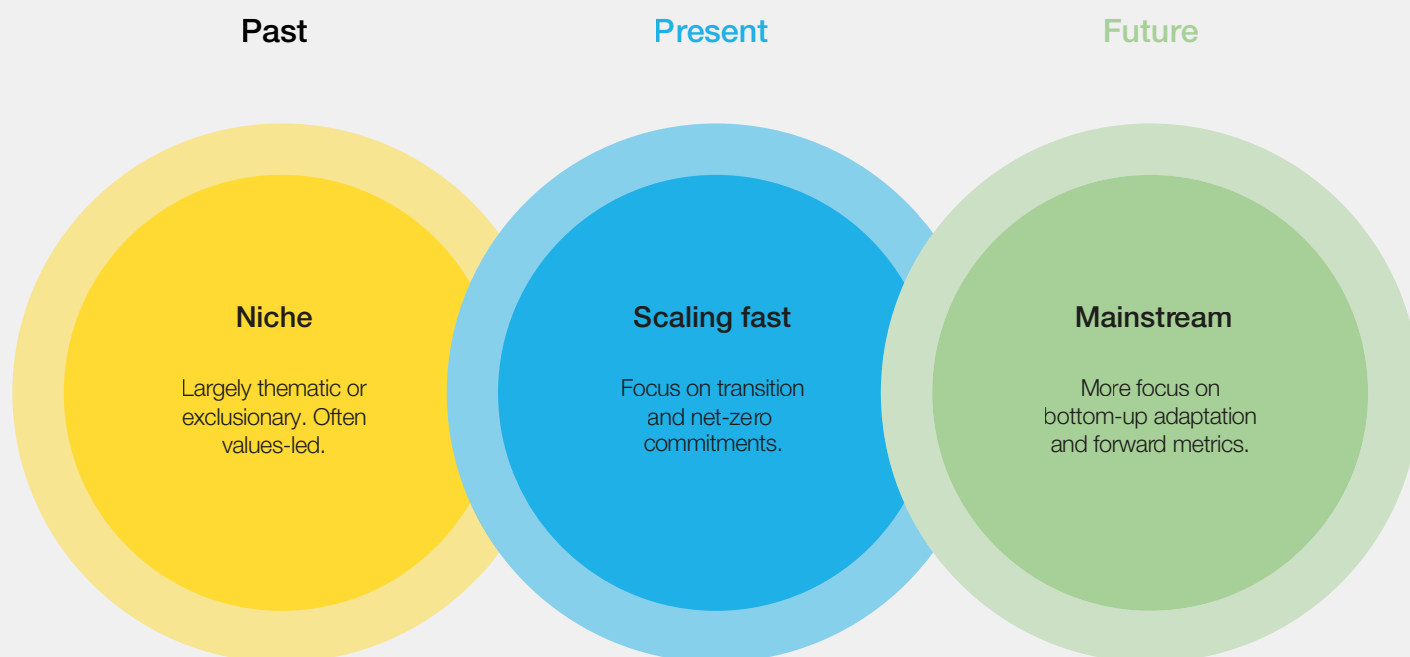
- **Reduce green premiums.** Greater emphasis is needed on creating innovative policies that accelerate change and increase innovation. Finance can play an important role in financing green innovations by ensuring a focus on the measures that shift the post-tax cost of capital. No government, public bodies or capital market alone can bring about a whole economy's transition.

Building an inclusive financial ecosystem

Strategies for operationalizing these pathways include:

- **Re-establish infrastructure to form a new financial ecosystem.** Special efforts must be made to develop the following five elements: a digital ID to provide affordable access to financial services by households and SMEs;

FIGURE 1 A new phase for green investing



“Data and AI analytics can be leveraged to allow access to financing and reduce the cost of financing and insurance premiums.

cybersecured and fully integrated infrastructure; ethical and robust data governance frameworks; an accessible enforcement regime on data and cybersecurity; and digital literacy through society-wide knowledge training and sharing. This requires global digital governance that goes beyond the mandate of current standard-setting bodies, extending benefits to the underprivileged and connecting financial authorities with those in charge of data protection, cybersecurity and competition to preserve an integrated global financial system.

- **Embrace new fintech players.** Fintech players have proven successful in leveraging mobile technology to make small-ticket payments more affordable. Data and AI analytics can be leveraged to allow access to financing and reduce the cost of financing and insurance premiums. In the future, innovation in financial data services can be utilized to differentiate costs and risk measurements in ESG financing and digitalize measurement techniques in inclusive loans and insurance policies.

Rethinking governance in the age of digital currencies

Strategies for operationalizing these pathways include:

- **Establish rules for digital identity governance.** In the formal economy, the greatest part of a payment transaction is verifying the identity of the individuals or entities on either side of the transaction. While CBDCs promise to revolutionize payments and deliver efficiencies for consumers (retail or commercial), it is still unclear how their architecture accommodates an identity layer. A digital identity layer should be developed

independently of other parts of payment processes and systems, such as authorizing/authenticating transactions or applications.

- **Ensure data governance.** The traditional financial service ecosystem has struggled for years to come up with data-sharing models that will boost competition and allow for new services and business models. A new CBDC infrastructure could allow for a novel data-sharing and integration layer that can deliver through APIs much more quickly and efficiently.
- **Improve financial inclusion.** A key decision regarding network governance is who receives access to the infrastructure, and under what terms and conditions. This has been a topic of ongoing debates for decades when thinking of payment infrastructures nationally (e.g. access to payment schemes such as BACS in the UK) and internationally (e.g. access to payment communication networks such as SWIFT). CBDC or digital money infrastructure will call into question governance issues commonly seen in national payment infrastructure. Depending on governance conditions, its design can be more inclusive and contribute to addressing financial exclusion.
- **Address risk and fiscal governance.** Naturally, CBDCs are characterized as central bank money, thus they are understood to be a direct liability to the central bank who also manages the risks and ensures the monetary stability of the value transfer infrastructure (i.e. through maintaining the core ledger). While this archetype of fiscal and risk governance is well-established as a model for CBDC design, different governance conditions could be envisioned to distribute the responsibilities and allow for other financial institutions to play a part in the running of the payment system.



Risk resilience

Management of frontier risks ensures that any negative impacts arising from human progress are minimized.



The progress called for in the collective vision for 2025 has the potential to better connect and equalize the world – but in doing so, it could lower the natural containment barriers to cascading global risks. Advances in digital equality, social equity and environmental resilience could both contribute to, and be destabilized by, several interconnected risks.

Among them, frontier risks require particular attention. Frontier risks include the unintended consequences of human progress: risks that emerge as technologies surface or human and societal forces shift. There are at least four critical areas of human development for which there is more limited understanding of whether, when and how specific risks could emerge:

- Advances into new territorial and geographic frontiers, such as space exploration
- Breaches to ecological and environmental boundaries, such as geoengineering
- Technologies expanding frontiers in human communication, such as through social networks and AI
- Advances in the human-technology interface, such as through genetic enhancement

The impact or likelihood of frontier risks is often unknown and therefore almost impossible to fully predict. Enhanced identification and monitoring of these risks, however, can ensure that any unintended impacts on economies and societies stemming from human development are minimized.

Vision 2025

Developing an expanded risk universe

“The more obscure a risk or the more distant someone is from a situation, the harder it is to pay attention to it.”⁶⁹ Frontier risks pose a particular challenge because early-warning signs are often subtle and ambiguous. Potential blind spots in the management of frontier risks may arise from:

- Systematic errors in judgement of the likelihood or impact of these risks, due to weak monitoring signals and cognitive biases around the perception of risk
- Institutional architecture, where diffuse accountability or momentum to push towards a frontier may cause decision-makers to discount these risks
- Societal norms, such as a lack of public trust in public- and private-sector institutions, or fragmentation between risk experts, the scientific community and decision-makers

More effective identification and prioritization of potential unintended consequences relating to human progress will not only increase general awareness, but also allow decision-makers take steps to mitigate exposure to these frontier risks.

Refining risk management

Frontier risks do not usually fall neatly within existing enterprise risk management (ERM) frameworks. At a minimum, defined ownership of these risks within senior management will ensure a more proactive response to emerging trends. Soft controls, or organizational culture, can also enhance resilience to threats. Entities with an openness to uncertainty and alternative viewpoints, the ability to track and learn from small failures, and a reliance on frontline knowledge will be better equipped to detect risks and recover from shocks.

Enabling transparent risk communication

Beyond organizational resilience, a clear and consistent risk narrative that is transparently communicated to society will awaken policy-makers and the public to more uncertain threats. This narrative should be based on long-term risk scenarios, outlining drivers and trends which are played out in multiple future dimensions. Importantly, effective narratives should focus not only on protective actions, but also on clear explanations of the nature and known/unknown character of the risk, in language that is accessible to the community.

Ensuring a resilient risk response

Governments, regional bodies and international organizations have a role to play in preventing or hedging against potential risks. For example, governments and international bodies should prioritize closing gaps in legal frameworks governing new frontiers, such as in the realm of space or AI. This requires governing institutions to develop or collaborate with the private sector to harness the expertise needed to responsibly regulate these issues.

It is equally important to facilitate recovery from the materialization of a frontier risk. COVID-19 has shown that economic buffers, such as automatic stabilizers and agile emergency spending triggers, are key to ensuring markets can bounce back from unanticipated shocks. While debt is already at an all-time high, some countries have managed to retain national emergency funds and crisis reserves, while others promote or provide insurance arrangements to shore up protections. Investment into critical infrastructure and redundancy expenditure are vital as well. Such initiatives are part and parcel of a country's ability to absorb unanticipated shocks and, therefore, its competitiveness.

“ Effective narratives should focus not only on protective actions, but also on clear explanations of the nature and known/unknown character of the risk.



Pathways to Vision 2025

Expanding risk perceptions

“Regular horizon scanning that draws from a diverse set of perspectives can help ensure that decision-makers do not miss, underestimate or underprepare for emerging frontier risks.”

Effective management relies on robust identification and prioritization. Frontier risks are uncertain, and risk assessment processes must be able to correspondingly address information gaps and adapt to early signals in the risk landscape. Regular horizon scanning that draws from a diverse set of perspectives can help ensure that decision-makers do not miss, underestimate or underprepare for emerging frontier risks.

Strategies for operationalizing this pathway include:

- **Leverage existing lists of risks developed by business, government or civil society organizations.** This should be a starting point, with a particular focus on those that develop insights into new and developing risks alongside existing risks. This includes existing intelligence developed by organizations that specialize in risks with uncertain characteristics, such as the Centre for the Study of Existential Risk,
- **Ensure diversity of perspectives when mapping out the parameters of frontier risks and future scenarios.** Latent biases and groupthink can be addressed through mechanisms that elevate under-represented voices (such as on-site workers who can often detect early warning signs), bring in lessons from other fields (for example, task forces or panels of cross-sectoral experts with a mandate to investigate a frontier risk), or are designed to stress-test existing perceptions (including scenario-based peer reviews of crisis or management decisions).
- **Prioritize frontier risks, acknowledging potential information gaps.** Consideration can be given to multiple factors, such as likelihood, impact, time to impact, connectivity with other risks, controllability and the cost/benefit of mitigation measures.

the Future of Humanity and the Centre for the Future of Intelligence.



Building risk-ready entities

Reorienting risk functions to ensure a responsive, whole-of-entity approach is not only vital to an entity's ability to see through a crisis, but can also contribute to its broader competitiveness.

Strategies for operationalizing this pathway include:

- **Assign accountability and develop escalation factors, prevention, mitigation and recovery control measures.** Frontier risks should be integrated into existing ERM processes, with accountability assigned to the C-Suite member(s). In the public sector, accountability should be centralized to avoid narrow viewpoints and non-systemic solutions;
- **Undertake regular monitoring of existing and new frontier risks.** Scientific and legal developments should be considered, and big data and machine learning harnessed, to better anticipate the direction of change and speed of travel for trends that may not otherwise be visible to management.
- **Assess soft controls.** For example, interviewing and surveying the workforce can help identify potential risk issues in organizational culture, which may require training or education to address.

investing in a coordinating body with direct lines to both the head of government and local units is one approach.

“ Well-formed scenarios developed in a collaborative process can help draw out potential impacts and educate the public on possible threats.

Developing effective narratives

While the above can help ensure organizational resilience to these threats, broader societal preparedness requires transparent risk communication across multiple stakeholder groups. When lacking data to quantify risks and evaluate their likelihoods, well-formed scenarios developed in a collaborative process can help draw out potential impacts and educate the public on possible threats.

Strategies for operationalizing this pathway include:

- **Develop clear scenarios that articulate the sources, drivers, amplifiers and tipping points of a particular risk.** They should be robust enough to be useful to decision-makers mapping out potential avenues for preparedness.
- **Be intentional about the language, format and timing of communications.** Use of behavioural science mechanisms, such as MINDSPACE (messenger, incentives, norms, defaults, salience, priming, affect, commitment and ego),⁷⁰ can help the narrative find greater traction. For example, sensory tools, such as art, gaming or virtual reality, can fill gaps and make threats “feel” real.
- **Protect against disinformation.** Greater regulation of social networks and protection against false information could help take the onus off individuals to filter out misinformation or disinformation and place the responsibility on the government or businesses overseeing these networks.

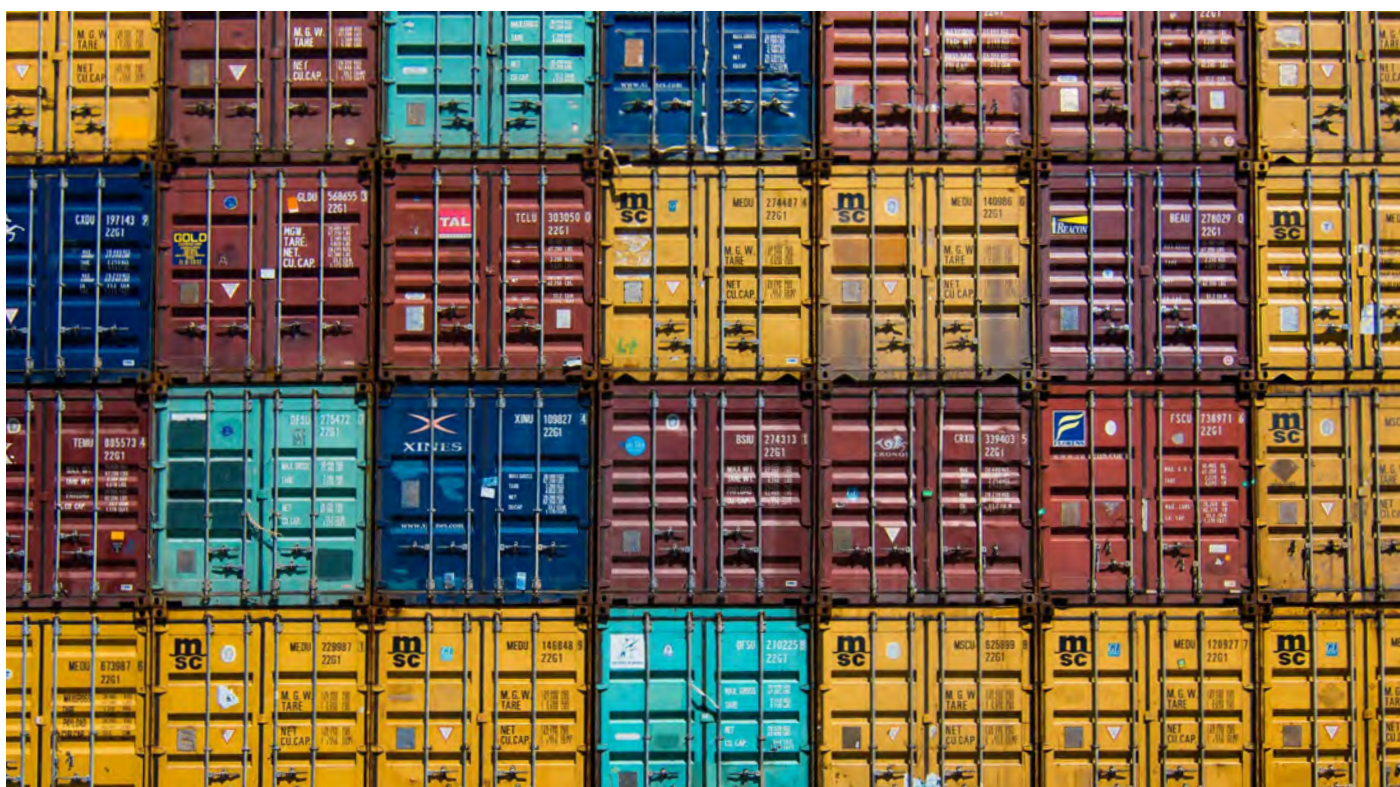
Reorienting resources to address frontier risks

Resources should be allocated towards both prevention (guardrails) and recovery (buffers). Controls must be both broad and flexible enough to address the unknown nature of frontier risks.

Strategies for operationalizing this pathway include:

- **Adopt precautionary principles in the development of new technologies.** Proactive regulation should also seek to anticipate potential future applications of emerging technologies and related ethical issues.
- **Prioritize closing gaps in legal standards governing new frontiers, such as space and AI.** International or transnational organizations may be well placed to coordinate frameworks or standards for new realms.
- **Reframe decision-making architecture to ensure adequate consideration of frontier risks in the allocation of investment.** For example, considerations around public financing could evolve to account for the longer-term impacts and interconnections of frontier risks that could exacerbate down-the-line costs.
- **Provide innovative insurance options to bridge gaps between frontier risks and opportunities.** Similarly, this could be as simple as a change to choice architecture to encourage forward-thinking decision-making in the selection of insurance products but, in some cases, stronger regulation and public-private collaboration may be required. For example, in light of increased flooding, France and Spain have introduced government-backed schemes that include a compulsory flat-rate surcharge for flood and other hazard coverage, while in the UK, mortgage lenders require flood coverage to be included in standard household insurance.





1.6

Trade and investment

Trade and investment are crucial levers for a sustainable and inclusive recovery that benefits people and the planet.

As the world enters an unequal recovery, four trends stand out:

- **Disruptions.** Trade tensions, the COVID-19 pandemic, demand and supply shocks, fluctuating transport costs, natural disasters, national security measures and semiconductor shortages have contributed to supply chain disruptions and highlighted the importance of risk planning and resilience.
- **Digitalization.** The pandemic accelerated digitalization, with digital trade keeping the economy going through the crisis. Digitally deliverable services grew from 52% of service exports in 2019 to 64% in 2020.⁷¹
- **Sustainability and inclusion.** Concern about vaccine equity, climate change, environmental pollution, biodiversity loss, societal inequalities

and labour right violations demands action on trade and investment. Vaccine inequity is at the heart of the unequal recovery.

- **Dysfunction in trade governance.** Existing global trade rules have proven incapable of adequately addressing complex trade frictions arising from incompatibilities between market and non-market economies. Failure to achieve redress through multilateral channels has led to an increase in unilateral trade actions, some of which have been taken on contentious grounds.

Trade and investment are crucial levers for a sustainable and inclusive recovery that benefits people and the planet. Yet global economic cooperation, rule-making and dispute settlement are faltering, and the public is largely ambivalent about globalization.⁷²

Vision 2025

Enhancing economic growth and development

Over the next three years, trade and investment must serve as engines of economic recovery, growth and development. In 2025, the vision is for policies and practices that:

- Facilitate trade and investment by removing frictions and inefficiencies in the processes involved in moving goods, services and capital across borders
- Boost employment, incomes, competitiveness, innovation and value chain upgrading through economic integration, particularly in developing and least developed countries
- Enable digital trade, while keeping in check such harms as threats to online competition or the lack of competition regulation and enforcement, and the lack of transparency
- Support developing countries, especially the least developed, to fully engage and benefit from trade and investment

Reducing societal inequalities

For trade to be truly inclusive, it must benefit all sections of society. The vision is for trade and flanking policies and practices that:

- Raise living standards and wages; improve working conditions, worker safety and pay; and protect labour and human rights
- Enable micro, small and medium-sized enterprises (MSMEs) to fully engage in the global economy
- Benefit women⁷³ and underserved and marginalized communities, including ethnic minorities and Indigenous peoples

Enabling environmental sustainability

Trade and investment policies and practices have a significant impact on production and consumption around the world and can be powerful levers to shift to more environmentally sustainable growth. As countries move to tackle climate change and environmental degradation at different speeds and often through unilateral measures, international cooperation will be essential to avoid conflicts.

Trade and investment policies and practices must align with sustainability goals to:

- Mitigate climate change
- Enable a circular economy and reduce waste
- Reduce environmental pollution and protect biodiversity

“ Trade and investment policies and practices have a significant impact on production and consumption around the world and can be powerful levers to shift to more environmentally sustainable growth.”



Pathways to Vision 2025

Supporting evidence-based policy development

Sound economic policies are built on a strong evidence base, inclusive and broad-based stakeholder dialogue and iterative and practical testing and refinement.

Strategies for operationalizing this pathway include:

- **Support data collection and analysis.** Data and analysis on current economic policies, their

scope, design and effects domestically and internationally, as well as information on best practices, should inform policy development. Gender-disaggregated data, and data on trade, ethnic minorities and Indigenous peoples, are needed to inform more inclusive trade policy.

- **Engage all stakeholders.** Consultations must include all stakeholders to ensure broad-based input and buy-in.
- **Test and refine.** There is scope for more piloting and iterative refining of economic policy.



Advancing discussions and meaningful agreements

While many governments have advanced new trade rules through bilateral and regional trade agreements, some areas would benefit from multilateral and plurilateral rule-making through the World Trade Organization (WTO).

Strategies for operationalizing this pathway include:

- **Conclude a meaningful electronic commerce agreement.** The agreement must seek to improve access and interoperability, enable safe and efficient digital trade and data flows, promote openness and trust, and address market access issues. Also, countries should abstain from applying customs duties on electronic transmissions.
- **Conclude a meaningful investment facilitation for development agreement.** The agreement should aim to improve transparency and predictability, streamline administrative procedures, reduce disputes and enhance sustainable investment.
- **Conclude environmental agreements.** This includes delivering agreements on fisheries

and fossil fuel subsidies; addressing tensions between trade and climate policies, including carbon taxes and border adjustment; and reducing siloes between trade, environment and development policy-making by aligning trade action with international environmental commitments, while ensuring a just transition.

- **Advance ambitious agreements on trade and gender, MSMEs and least developed countries.** This will ensure that the benefits of trade reach all sections of society and all WTO members.
- **Advance a trade and health agenda.** A trade and health package may include lowering tariff and administrative barriers to trade in inputs and final products, facilitating global manufacturing investment, improving supply chain transparency, removing export restraints and addressing the relationship between IP rights and access to life-saving technologies.
- **Discuss level-playing-field concerns.** Members should initiate open and inclusive discussions to resolve level-playing-field concerns on subsidies, state-owned enterprises, and trade remedies and government procurement across industrial, agricultural and service sectors.

Reforming trade governance

Various WTO members have put forward proposals for reform. Members must work together to address common concerns to revitalize multilateralism and reduce the incentive for unilateral action.

Strategies for operationalizing this pathway include:

- **Revitalize rule-making.** Trade rules can be updated by working through open plurilateral negotiations (where necessary) and multilateral negotiations (where possible).
- **Promote transparency.** This can be furthered by supporting and incentivizing the notification of measures by countries; encouraging independent, third-party initiatives that track trade measures; and monitoring compliance with commitments.
- **Restore dispute settlement.** Efforts in this area can include addressing members' concerns with the WTO's dispute settlement system and appointing Appellate Body members.

Supporting public-private initiatives to facilitate sustainable trade and investment

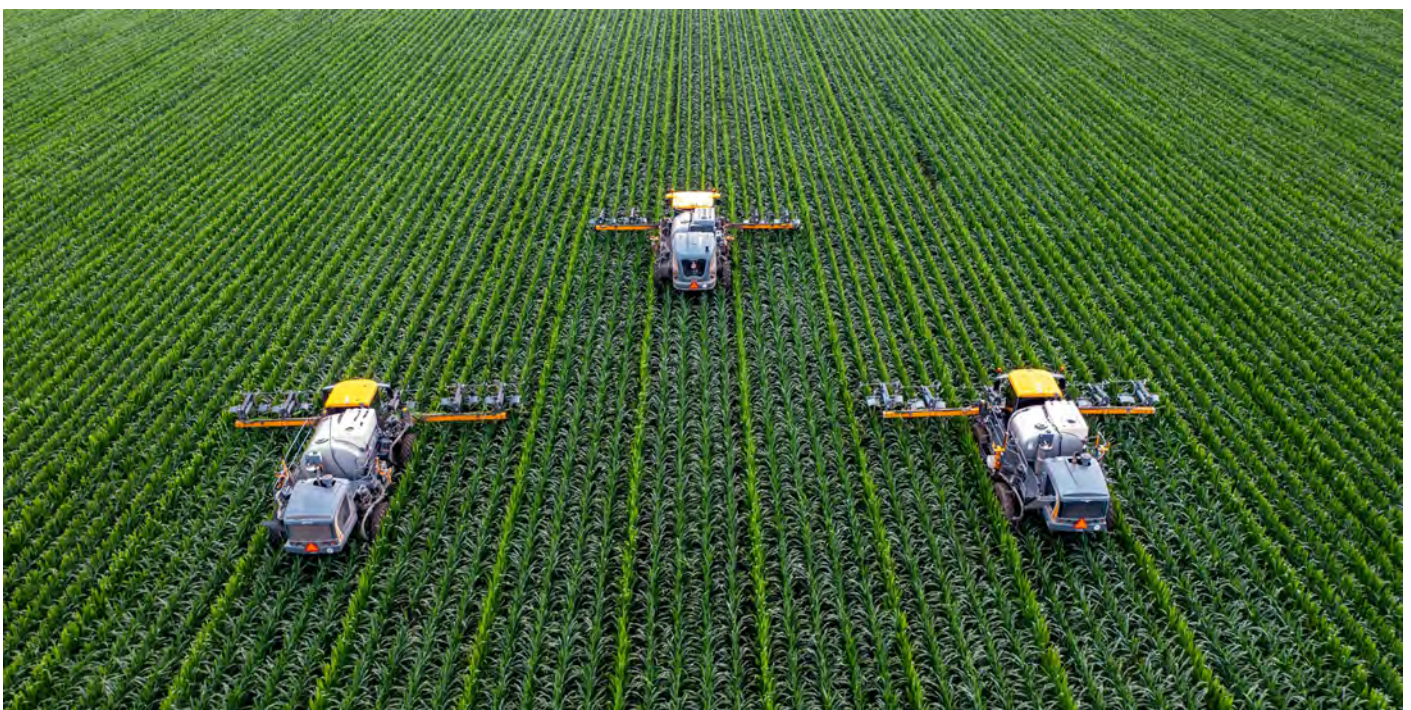
Facilitating trade in goods and services, as well as investment, can result in gains in efficiency and boost economic growth and development. Facilitation involves simplifying, streamlining, modernizing and harmonizing administrative processes throughout the supply chain. In addition, public-private action is needed to make

certain that sustainable supply chains ensure environmental and societal benefits.

Strategies for operationalizing this pathway include:

- **Facilitate trade in goods.** Efforts can include supporting developing countries in implementing the Agreement on Trade Facilitation and encouraging public-private initiatives to identify and tackle specific bottlenecks.
- **Streamline domestic regulation of services.** This can be pursued by supporting developing country implementation of commitments in the Joint Statement Initiative Reference Paper on Services Domestic Regulation.
- **Facilitate investment.** Action here can include advancing an agreement on facilitating investment for development, supporting developing countries in implementation, and encouraging public-private initiatives to identify and tackle specific bottlenecks and enable sustainable investment.
- **Support sustainable trade.** A range of approaches is possible, such as creating platforms to share best practices in meeting the challenges of sustainable trade and striking a balance across the economic, social, and environmental pillars of sustainability; recognizing the role supply chains can play in contributing to climate action, the circular economy, labour protection, gender equity, ethnic minorities, Indigenous peoples' upliftment and MSME development; identifying and addressing barriers to making supply chains and business practices environmentally and societally sustainable; ensuring coherent regulation and standards; and supporting supply chain traceability as an enabler.

🗣️ **Public-private action is needed to make certain that sustainable supply chains ensure environmental and societal benefits.**



Transparency and anti-corruption

Technology-driven gains in transparency and accountability are critical for confidence in business and trust in government.



“ Today, organizations are exposed to a wider variety of legal and reputational risks than ever before.

Corruption costs the world economy approximately 5% of GDP, or \$3.6 trillion, annually.⁷⁴ Moreover, estimated monetary losses do not reflect the total cost of corrupt acts. A \$1 million bribe can easily be magnified into \$100 million in damage to society, as corruption can deter future investment, result in substandard infrastructure and lead to underfunded social programmes, among other harms.

The field of transparency and anti-corruption is rapidly evolving, with key trends emerging in the following areas:

- **The expansion of ethics and integrity risks.** Today organizations are exposed to a wider variety of legal and reputational risks than ever before. Factors such as employee voice, human rights and environmental sustainability have begun to redefine corporate priorities and shed new light on the importance of integrity, accountability and transparency.
- **A growing focus on ESG frameworks.** As the momentum around ESG investing translates into metrics, action and binding law, the role and significance of corruption is often sidelined.
- **An increase in transnational, cross-sectoral corruption risks.** High-profile global investigations, such as the “Panama”, “Paradise” and “Pandora” papers, have drawn widespread attention to the role of certain industries in relation to money laundering, financial fraud, corruption schemes, tax/sanctions evasion and criminal/terrorist financing.
- **The digital disruption of anti-corruption.** Developments in AI, blockchain, cryptocurrency and digitalized government services are reshaping corruption risks and anti-corruption mechanisms.

The World Economic Forum Global Future Council on Transparency and Anti-Corruption has developed an agenda for business integrity based upon four pillars: 1) committing to ethics and integrity beyond compliance; 2) strengthening corporate culture and incentives to drive continuous learning and improvement; 3) leveraging technologies; and 4) supporting collective action.

Vision 2025

“Technology-driven gains in transparency and accountability prove critical for increasing confidence in business and restoring trust in government.”

Breaking silos between ethics and integrity

Public concern around inequity, human rights abuses, the environmental crisis and corporate hypocrisy are translating into an evolving and expanding regulatory agenda. The current climate of heightened expectations and legal obligations necessitate a more strategic and coordinated approach to integrity commitments, one that is driven by a culture of integrity beyond compliance. The disruption of long-standing tendencies to silo integrity risks and turn ethics into box-ticking, which serve neither organizational nor stakeholder interests, is key.

Embedding integrity into ESG performance

The world's attention has justifiably fixated on the existential threats of corporate-caused climate change and, increasingly, human rights abuses and inequity. However, investors, regulators and corporate actors should not lose sight of the corrupt conduct that frequently enables environmentally and socially corrosive behaviour.

Within ESG, corruption is both a vertical and horizontal concern – directly measurable as a key factor within the “G”, while simultaneously impacting the “S” and “E”. The growing global momentum around combatting inequity, human rights violations and climate change will prove futile if corruption is not simultaneously reigned in.



Combatting transnational, cross-sectoral illicit financial flows

No single country, company or industry can achieve its anti-corruption goals alone. Although governmental resources and attention have powered anti-corruption efforts for decades, the role and responsibility of the private sector is increasingly in the spotlight.

While professionals in some countries are highly regulated, others have no affirmative duty to report suspected criminal activity or verify the origin of the assets they handle. This patchwork and frequently lacklustre approach to private-sector regulation has come at a high cost, allowing corrupt actors to manipulate markets, erode public services, fund criminal networks and waste trillions of dollars annually.⁷⁵

Maximizing the anti-corruption potential of tech innovation

Technological innovation is changing, challenging and enhancing the field of anti-corruption. Most technological developments present both negative and positive anti-corruption potential – increasing transparency and accessibility while opening new avenues for abuse by hackers and criminals. To fully appreciate the corruption risks and anti-corruption potential of digitalization, integrity, accountability and transparency is placed at the heart of tech initiatives from the outset. Moreover, from transparent public procurement processes to data-driven early warning systems, technology-driven gains in transparency and accountability prove critical for increasing confidence in business and restoring trust in government.



Pathways to Vision 2025

Leveraging practitioner insights to achieve holistic organizational integrity

Increasing stakeholder expectations and an expanding regulatory agenda require organizations to foster internal alignment and collaboration across ESG/sustainability, public affairs, risk, ethics and compliance. Organizational commitments can no longer be based solely on calculations that will drive growth and increase profit. The integrity mandate must include all of an organization's regulatory and voluntary commitments, as well as other sources of stakeholder expectations. Speaking to and working with practitioners will prove vital to achieving and operationalizing an integrated approach to ethics and integrity.

Strategies for operationalizing this pathway include:

- **Empower and expand the integrity function.** The World Economic Forum White Paper entitled “The Rise and Role of the Chief Integrity Officer: Leadership Imperatives in an ESG-Driven World” outlines key outcomes and recommendations for chief integrity officers adapting to the current climate of heightened risk and opportunity.⁷⁶
- **Foster integrity-based collective action and peer learning.** The Council and the World Economic Forum Partnering Against Corruption Initiative (PACI) convened a peer learning session with corporate compliance officers from industry-leading organizations focused on the intersection of and synergies between anti-corruption and human rights compliance.

“Organizations and investors must ensure that their values align with their ESG priorities and that both include integrity at their centre.”

Raising the role and profile of organizational integrity within ESG frameworks

Organizational integrity should be understood as the foundational element of any ESG framework. It is impossible to achieve environmental, social, governance or financial goals without properly accounting for corruption risks. Corruption also impacts the entire range of stakeholders, from shareholders and employees, to community members and the planet. As such, realizing a stakeholder-centred and sustainable business agenda – the stated goal of the Business Roundtable and the World Economic Forum International Business Council – cannot be achieved without tackling corruption. Organizations and investors must ensure that their values align with their ESG priorities and that both include integrity at their centre.

Strategies for operationalizing this pathway include:

- **Chart a path for investing with integrity.** In a forthcoming series on investing with integrity, the Global Future Council makes the case for raising the profile of corruption risks within ESG investing frameworks. The series also provides key recommendations for the investor universe (asset managers, asset owners, rating agencies and transnational standard-setting organizations) on how to effectively incorporate and prioritize corruption risks.
- **Embed ESG within organizational integrity priorities.** The Forum White Paper, “The Rise and Role of the Chief Integrity Officer”, includes

recommendations on how integrity officers can use materiality and risk assessments, as well as a long-term and holistic outlook, to effectively operationalize ESG integration.

Facilitating transnational and multisectoral anti-corruption action

The transnational and multisectoral nature of illicit financial flows demands a transnational and multisectoral response. The adoption of common frameworks and coalitions across a diverse array of professionals presents various benefits. First, such frameworks invite collective recognition. At present, many private-sector professionals and even entire industries do not fully appreciate their role in facilitating harmful financial activities. Second, collective action more adequately addresses the reality of an interconnected world, in which the weakness of one actor or industry becomes the weakness of all. Third, there is strength in numbers. The development of a unified, collective approach to fighting corruption will minimize the costs of illicit financial flows to society while maximizing the benefits of increased integrity.⁷⁷

Strategies for operationalizing this pathway include:

- **Endorse the Unifying Framework for gatekeeping professionals.** The Unifying Framework, launched in June 2021, is “a value-based self-regulatory framework for private-sector intermediaries who are strategically positioned to prevent or interrupt illicit financial flows – collectively referred to as ‘gatekeepers’”.⁷⁸ It was developed by a cross-sectoral task force of industry leaders

convened by the Council and PACI, with the support of the World Bank-UN Office on Drugs and Crime (UNODC) Stolen Asset Recovery Initiative.⁷⁹

- **Leverage existing fora.** Dialogue and peer learning about anti-corruption trends, priorities and future pathways can be facilitated. The Council leverages the expertise of the PACI community in guiding its research agenda and shaping recommendations.

Promoting the advancement and adoption of tech for integrity

Data-driven, tech-based anti-corruption solutions are rapidly expanding in sophistication and potential. Tech innovations, powered by data and behavioural insight, are disrupting corruption risks and boosting integrity systems. They are accelerating new forms of accountability based on the smarter exploitation of big data and fostering new public-private partnerships for integrity. In the digital era, data have become critical assets for integrity actors to detect and deter fraud risks, complex networks and corrupt practices.⁸⁰

Strategies for operationalizing this pathway include:

- **Facilitate peer learning around tech for integrity.** PACI’s Tech for Integrity (T4I) platform provides insight on digital anti-corruption solutions and builds networks across sectors and the public-private divide. T4I helps promote the advancement and adoption of digital anti-corruption solutions through the sharing of best practices by industry experts, while also building awareness of the positive and negative potential of tech innovation.

“ The development of a unified, collective approach to fighting corruption will minimize the costs of illicit financial flows to society while maximizing the benefits of increased integrity.



② Environment





2.1

Clean air

Reducing air pollution will allow healthier and more productive lives, a healthier natural environment, economic benefits and increased shared prosperity.

Air pollution is a transboundary challenge that affects everyone, particularly the most vulnerable. Reducing air pollution will provide benefits like healthier and more productive lives, a healthier natural environment, economic benefits and increased shared prosperity. Addressing air pollution will contribute to keeping global warming under 1.5° C.

- **Human right.** Clean air is a human right and a priority. According to the United Nations Environment Programme, air pollution is the largest environmental risk to global public health.⁶¹ It harms human health and well-being, reduces quality of life and is linked to premature mortality. The majority of the world's population lives in areas with high air pollution.⁶²
- **Equity.** Although everyone is affected by air pollution, the distribution of disease burden

is inequitable as it is influenced by age, gender, income levels, access to nutrition and healthcare, and underlying diseases.

- **Climate change.** Reducing air pollution contributes to climate action as air pollutants come from the same sources as GHGs. Many air pollutants are both bad for human health and are powerful accelerators of climate change, thus impacting people's lives and making the future less safe for future generations.

Calls for urgent action on reducing air pollution have increased in recent years. The World Economic Forum Global Future Council on Clean Air joins these calls for action and promotes an integrated approach to improving air quality for all, based on scientific evidence, strong political action and a participatory, multistakeholder approach.

Vision 2025

Building strong networks at the local, regional and national levels

Air pollution has local, regional, national and global impact. The transboundary nature of air pollution requires regional and international, coordinated and joined efforts with clear and ambitious reduction targets. Strong networks enhance knowledge and best practice exchanges and further understanding of the complexity of air pollution. Cross-stakeholder collaboration and fora advise local and national governments on actions that can be taken to design and develop appropriate mitigation pathways to reduce emissions.

Local action

- Cities join existing networks (e.g. C40, UN Sustainable Cities), working together to enhance their agenda on sustainable development and achieve the United Nations Sustainable Development Goals (SDGs) that include air pollution.
- Cities have the capacity to monitor and report air pollution.
- Cities develop air pollution emission inventories that are regularly updated.

Regional and international collaboration

- Countries join and actively participate in conventions (e.g. United Nations Economic Commission for Europe Long-range Transboundary Air Pollution – LRTAP Convention) that aim to limit, reduce and prevent air pollution.
- Countries introduce and enforce regulations that follow the Air Quality Guidelines set by the World Health Organization.

- Countries have the capacity to monitor air quality and develop air pollution emission inventories that are regularly updated and publicly reported.

Rethinking education

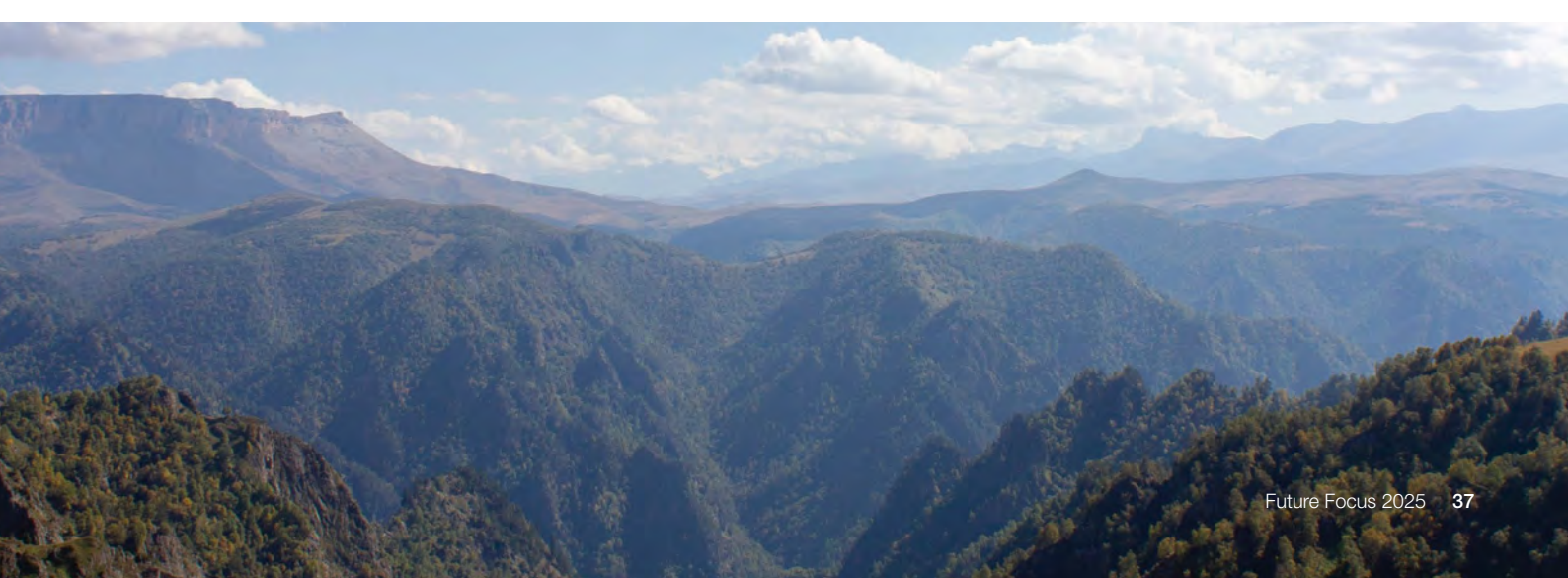
Air pollution is part of curricula of different grades in various courses and modules. Education for Sustainable Development (ESD) is present in curricula across the world in different age groups, and air pollution is one of the key themes discussed explicitly in different grades and disseminated worldwide. Including air pollution in the curricula builds the skills but also the attitudes needed to approach this complex problem and to foster new generations of problem-solvers.

Interdisciplinary approaches include:

- Air pollution is explicitly present in curricula of all disciplines and all grades.
- Air pollution is clearly presented as an interdisciplinary challenge that requires interdisciplinary solutions.
- Air pollution is presented with adequate scope and context so that the different disciplines and grades understand the wide range of its impacts.

Recognizing private-sector leadership and action

The private sector measures and takes action to reduce air pollution within the operations of companies and uses its influence on supply chains to reduce associated air pollution. This increases the visibility of air pollution and its effects, and more companies join to champion action for clean air. Companies use assets and abilities innovatively to tackle and reduce existing air pollution emissions and prevent future emissions.



Pathways to Vision 2025

Investing in local networks

While actions to improve air quality at the national level remain critical, local and regional actions play a key role in addressing the challenge of air pollution by targeting key sectors (transport, residential).

Strategies for operationalizing this pathway include:

- **Increase knowledge exchange between regions.** Establishing monitoring networks, assessing the health impacts and developing appropriate local policies can play a critical role in reducing premature mortality, improving life quality and reducing costs related to air pollution.
- **Invest in capacity building.** Improvement is needed in the capacity of local and national governments to understand the complex nature of the issue scientifically, the institutional mechanisms that enable complex coordination between different agencies within government to achieve an outcome, and policy formulation and monitoring based on data and scientific evidence.
- **Join existing initiatives.** Participating in networks or projects such as BreatheLife or C40 Cities' Clean Air Cities Declaration demonstrates a commitment to bring air quality to safe levels and collaborate on accelerated clean air solutions.



Preparing the next generation of thought leaders

Mapping and understanding the needs of students, life-long learners and educators is a key step to appropriately include ESD and, therefore, air pollution in the different curricula. An open and transparent dialogue between the various stakeholders (educational institutions, students, government agencies) must be promoted, and schools and universities need to respond to the increasing demand for more ESD.

Strategies for operationalizing this pathway include:

- **Invest in the power of young people.** Engaging with them at an early age and informing and educating them on the magnitude of the air pollution challenge will motivate their efforts.
- **Involve universities and educators.** Educational institutions can incorporate air pollution into curricula.
- **Promote transparent, multistakeholder dialogues.** Diverse voices need to be represented in the creation of the curricula.

“ Appropriate monitoring and reporting of emissions are a critical step to achieve the desired air pollution reductions.

Monitoring, reporting and reducing emissions

The private sector has a key role to play in achieving the global reduction of air pollution. Appropriate monitoring and reporting of emissions are a critical step to achieve the desired air pollution reductions. Despite the fact that most companies have developed sustainability agendas, very few companies monitor and report their air pollution emissions across their value chains.

Strategies for operationalizing this pathway include:

- **Share best practices.** Either within a specific industry, or across diverse industries, best practices need to be shared to achieve the desired reductions in emissions as quickly and as efficiently as possible.
- **Develop emission inventories.** This can be done through integrated approaches that address GHG and air pollution emissions.
- **Join the Alliance for Clean Air.** The Global Future Council on Clean Air has developed the Alliance for Clean Air, which gathers business leaders to understand their impact on air quality and to act to reduce it.

Adopting a “Learn, Act, Engage” framework

To achieve meaningful reductions in air pollution, the focus must be on widening the participation and awareness of all citizens. The “Learn, Act, Engage” framework represents steps and actions that citizens can take to reduce air pollution.

Strategies for operationalizing this pathway include:

- **Improve access to real-time data.** Citizens should have access to reliable, real-time data that present air pollution levels in their area.
- **Use participatory approaches in decision-making.** To ensure all societal groups are appropriately represented in decision- and policy-making, the focus must be on participatory approaches that take into consideration the different perspectives of citizens.
- **Raise awareness.** Raising awareness of the issue of air pollution is critical as citizens in many cities are exposed in harmful, life-threatening pollutants in their daily lives.



Clean electrification

60% of current emissions would be reduced by electrifying road transport, buildings and low-temperature industrial processes, in combination with renewable power generation.



According to the International Energy Agency in its *World Energy Outlook 2021*, “electricity’s share of the world’s final consumption of energy has risen steadily over recent decades”, and it promises to become the energy source on which consumers rely for all their everyday needs.⁸³ The reliability, resilience and affordability of electricity will become even more critical.

Two developments are particularly important:

- **The climate imperative.** To avoid the most damaging effects of global warming, the

temperature rise must be limited to 1.5° C by the end of the century. Halving carbon emissions by 2030 will require electrifying energy demand and supplying it with renewable generation.

- **The new energy economy.** Higher degrees of electrification of energy use in areas like mobility, industries and cities, and the increasing speed of technological developments, are driving the emergence of a new energy economy, which will be more electrified, efficient, interconnected and clean.

Vision 2025

Increasing the electrification of energy uses to reduce emissions

The electrification of end uses offers higher potential in reducing greenhouse gas (GHG) emissions. The three energy uses that are ready for transformation include:

- Mobility: the electrification of road transport would reduce current equivalent CO₂ emissions by approximately 12%.⁸⁴
- Buildings: electrification of heating would reduce equivalent CO₂ emissions by approximately 6%.⁸⁵
- Industry: all processes with industrial heat requirements below 1,000° C could be electrified with technologies available today, eliminating approximately 6% of equivalent CO₂ emissions.⁸⁶

Direct electrification is the obvious winner in these three sectors for speed, scale and cost. This is because the technologies already exist, and in fact are easier to access for retrofit due to shorter lifespans. In addition, accelerating the decarbonization of the power sector (on current uses) would further reduce emissions by approximately 30%.⁸⁷ Finally, the displacement of fossil fuels would have a positive impact on the

approximately 6% fugitive emissions from the oil and gas industry.⁸⁸ In total, 60% of current emissions would be reduced by electrifying road transport, buildings and low-temperature industrial processes, in combination with renewable power generation.⁸⁹

Benefiting from efficiency gains through electrification

One of the key benefits of electrification, particularly electrification powered by renewables, is the enormous efficiency gain that can be realized: this approach will halve the primary energy requirements of most economies.

The current energy system is wasteful. In the United States alone, approximately 70% of primary energy is “rejected energy”. An electric car uses about one-third of the energy than a car with a diesel or petrol engine. A heat pump powered by clean electricity provides two to four times as much heat to a home as a boiler powered by natural gas. Similarly, on the supply side, renewable power plants are far more efficient than their fossil fuel counterparts,⁹⁰ as coal and gas power plants lose almost half of their energy as heat. In addition, a typically underappreciated benefit of clean electrification is the elimination of supply chains for mining and moving the fossil fuels around the globe.

“ Accelerating the decarbonization of the power sector (on current uses) would further reduce emissions by approximately 30%.



Pathways to Vision 2025

Mainstreaming policy and action

Clean technology has reached maturity. Now, additional policy, regulation and strategy are needed for massive deployment. Governments may take the lead on policies to support the transformation, which will have major economic and environmental benefits in the long run. This support includes:

- **Focus on critical industries.** Several industries must scale ten-fold: electric vehicle production, heat pump production, battery production, and wind and solar energy production.
- **Train the workforce.** Unprecedented levels of workforce training are needed, including retraining and incentives for the fossil fuel industry workforce to transition to electrification.



Enabling electrification by empowering demand

The electricity grid was designed for consistent, predictable power generation, while large amounts of variable renewables will be needed for decarbonization. New digital technologies, however, can be incorporated that can make the demand flexible enough to accommodate fluctuations in generation.

Strategies for enabling electrification by empowering demand include:

- **Focus on deployment.** Technology is ready to meet that challenge. Both hardware and software technologies are readily available: distributed energy resources, vehicle-to-grid charging and smart metres are just some examples. What is missing now are the market mechanisms to allow those technologies to be deployed at scale.
- **Promote new business models.** Such models should transfer capital expenditures and risk from smaller players to financial providers and empower all stakeholders to become active contributors to a decarbonized power grid.⁹¹ A promising model is “Energy as a Service”, which shifts the cost and responsibility of the design, installation, maintenance and even management of distributed energy resources

from consumers to service providers. Those providers, in turn, reach agreements with insurers, energy companies and institutional investors ready to take over both capital for retrofitting and even operational expenses, in exchange for reasonable performance paybacks.

Evolving economic policy

Current policies in most countries are still adapted to a fossil-fuel based energy system. This situation must change to unlock clean energy technologies.

Strategies for operationalizing this pathway include:

- **Align fiscal tools with decarbonization goals.** Clean technologies typically have higher up-front capital costs and lower ongoing fuel and maintenance costs than the polluting alternatives. This challenge needs to be met with financing that makes the future more affordable.
- **Remove subsidies for fossil fuels.** Subsidies and tax incentives for fossil fuels are still present in many countries. Due to this market distortion, a residential customer typically has no economic incentive to change their heating system from fossil fuels to cleaner alternatives, and it also negatively impacts the economics of electric vehicles vis-à-vis petrol-powered cars.



“ Regulation is needed for new buildings to comply with emission limits and for existing buildings to meet a carbon performance benchmark that is increasingly stringent over time.

Strengthening and improving standards

Product standards provide the necessary tools and guidance to designers, producers, planners, builders, financiers and operators to ensure safety, reliability and operability. Standards can also be a critical part of ensuring that products are being manufactured with climate change in mind.

Strategies for strengthening and improving standards include:

- **Strengthen standards that have already proven effective.** Good examples are CO₂ limits for new fleet emissions for car manufacturers in Europe, renewable portfolio standards in the United States, and efficiency requirements for new buildings and large retrofits. These standards are crucial so that value chains of future products and services can be set up to push down costs and accelerate adoption. One of the most important areas for improvement is lowering not just the carbon costs of manufacturing

products and services but also the life-cycle carbon footprint of products and services. Such improvements in standards will push the world towards better usage of existing resources and a circular economy, which benefits both the climate and the wider environment.

- **Strategize the application of standards to buildings.** Regulation is needed for new buildings to comply with emission limits and for existing buildings to meet a carbon performance benchmark that is increasingly stringent over time. National building codes should be based on carbon emissions (instead of energy), be performance-based (instead of prescriptive), encourage clean electrification and use total life-cycle costs, including the social costs of carbon emissions, in cost-benefit analyses. Performance standards for existing buildings should build on existing performance benchmarking and labelling policies by requiring owners to retrofit non-compliant buildings. This would significantly increase the renovation rate of existing buildings above the currently insufficient 1-2% per year.

Energy transition

A successful global energy transition needs a strategic vision and clear ambition from leaders from government, industry and finance.

The energy sector remains at the heart of climate challenges, with energy consumption and production responsible for more than two-thirds of global GHG emissions due to strong dependence on fossil fuels. Energy also continues to play a central role in enabling economic development and growth, and the secure and reliable access to modern forms of energy is essential for the realization of the SDGs. For global climate targets and the SDGs to be met, the clean energy transition towards sustainable and inclusive energy systems therefore needs great acceleration globally.

Key trends include:

- **Sectoral energy transition approaches and revolutions.** Recognition is growing that a sector-by-sector energy transition approach will be needed because of sector-specific energy transition challenges, including specific political and technological considerations.
- **Increased focus on energy access and modern cooking.** Concerns are mounting that COVID-19 has dismantled the steady progress towards affordable, reliable and sustainable energy. The number of people without access to electricity increased in 2021, and 2.6

billion people continue to use destructive and polluting charcoal, wood and biomass for cooking.⁹²

- **Widening gap between action and commitments.** Despite a plethora of climate commitments by industry leaders, financial institutions and governments, global emissions are still on an upward trajectory with an increase of close to 5% in 2021 over 2020⁹³ as the world economy recovered and policies, investments and measures to put emission on a path to continued decline have not materialized at a global scale. Scepticism is growing about the robustness of these pledges and the willingness to implement them.

A successful global energy transition needs a strong strategic vision and clear ambitions from leaders from government, industry and finance. With only eight years left to halve GHG emissions to be on track to limit global warming to below 1.5° C by the end of the century, a much stronger focus on the execution and implementation of energy transition plans and strategies is needed now. New and strengthened commitments, targets and partnerships are also required to put the world on a pathway out of the climate crisis.

“New and strengthened commitments, targets and partnerships are required to put the world on a pathway out of the climate crisis.”



Vision 2025

Fostering industrial competitiveness and sectoral revolutions

In some sectors, decarbonization solutions are mature and readily available (e.g. electricity); in others, the solutions are still emerging (e.g. steel, cement, aluminium and aviation). At COP26 in Glasgow, a sectoral approach to problem-solving was already on display and major commitments were made.

In national conversations, the transformation of fossil-fuel-based infrastructure needs to be reframed as an opportunity to increase domestic industrial competitiveness by creating industries of the future. Countries that are leading the net-zero transition are creating incentives for the rest of the world to do the same. For example, announcements of the European Union (EU) introducing carbon-border tax adjustments have sent shockwaves, with countries behind in the race for decarbonization fearing impacts on the competitiveness of their industry exports.

Innovating low-carbon policy

Policy to support technological change will continue to play a crucial role in accelerating the transition and scaling technologies. Even as more governments adopt carbon taxes and other signals, the market alone will not cut pollution fast enough. The role of policy is to pick candidates and potential enablers to accelerate developments. These are technological systems that make it possible for many other sectors of the economy to cut their emissions, such as hydrogen and carbon capture, utilization and storage (CCUS). In every technological cluster where progress is fast, such as wind and solar, batteries, efficient lighting and electric vehicles, government policy has played an active role. However, a proper selection of technological contenders that should be supported and the creation of markets for new technologies while avoiding mercantilism is challenging. Low-carbon transition policy must focus not only on stimulating new innovations but must also actively phase out high-carbon technologies and sectors through both market incentives and industrial policy.



“ Emerging markets account for only one-fifth of global investment in clean energy yet for two-thirds of the world's population.

Mobilizing finance for transition

The deep decarbonization revolution will be more capital-intensive than earlier energy systems, so the role for finance in the global energy transition will be even greater. Finance needs to be attracted to where it is most needed, particularly to emerging markets, which account for only one-fifth of global investment in clean energy yet for two-thirds of the world's population.⁹⁴ Access to finance remains a key bottleneck due to real or perceived risks, and the costs of raising capital are often very high. Nominal financing costs in some economies are estimated to be up to seven times higher than in the United States and Europe.⁹⁵

Managing transition risks and a just transition

A just transition to a future clean energy system means one that takes care of the industries and workers directly impacted. Further, the transition also needs to be just with regard to the countries that are experiencing some of the greatest impacts of global warming, particularly those enduring the effects of rising seas. A just transition requires compensation and action.

Pathways to Vision 2025

Scaling technological enablers

The most important technological enablers for decarbonization are renewable electricity and electric power. With renewables becoming the cheapest source of electricity in many countries already, energy uses in the transport, heating and industrial sectors will increasingly switch from direct combustion of fossil fuels to renewable electricity. The expansion of electricity will require sizeable investments into renewable sources like solar and wind, but also in transmission and storage facilities, and in emerging digital technologies that can help run energy systems more efficiently and intelligently. Investment in clean, dispatchable power generation that can adjust output in tandem with renewable generators that are more variable and intermittent will also be needed. Important enablers include hydrogen (in particular for some hard-to-abate applications, such as high-temperature heat industrial applications) and CCUS (for decarbonizing many industrial sectors).

Strategies for scaling technological enablers include:

- **Address the financing gap in developing economies.** It is possible to develop new and innovative financial concepts to support the energy transition, tackle risk aversion of conventional capital and unlock new sources of

capital, for example through Net-Zero Equity,⁹⁶ a new and innovative concept incubated within the World Economic Forum Global Future Council on the Energy Transition.

- **Leverage Fourth Industrial Revolution technologies.** Emerging technologies, such as AI, have tremendous potential to accelerate and support the global energy transition, can be used to run energy systems more intelligently and efficiently, and can help with the integration of renewable generators that are more variable and intermittent.⁹⁷
- **Help developing countries to leapfrog.** Around 88% of the growth in electricity demand between 2019 and 2040 will likely come from emerging markets.⁹⁸ These countries have significant opportunities to leapfrog to sustainable electricity systems and skip the deployment of emission-intensive electricity infrastructure based on fossil fuels.⁹⁹
- **Get global supply chains for critical energy transition materials right.** Setting global standards and supporting innovation to boost supply diversity will help to eradicate potential choke points as global demand for materials such as lithium, cobalt and copper continues to increase.¹⁰⁰

“ The most important technological enablers for decarbonization are renewable electricity and electric power.



“ The First Movers Coalition is an example from hard-to-abate sectors willing to mobilize the necessary investments in emerging technologies, thereby creating a strong demand signal.

Forming alliances

In every sector, transformative change is led by alliances of the most committed governments and firms willing to bear the risk of bringing emerging technologies to maturity and commercial scale. The more selective these alliances, the more they choose their members strictly based on their ability to contribute to real innovation and problem-solving, the more powerful they are and the easier it is for cooperation to stay credible.

Strategies for forming alliances include:

- **Demand alliances.** To jump-start global demand, governments and customers who need low-carbon products should send credible demand signals to successful innovators (for example through long-term off-take agreements), thereby helping to mobilize the necessary investments and decrease costs. For example, corporate demand for clean electricity, through corporate power purchase agreements, has the potential to drive significant investment in renewable energy. Alliances like the Clean Energy Demand initiative (CEDI)¹⁰¹ are supporting countries and companies to enable corporate renewable procurement. The First Movers Coalition is another example from hard-to-abate sectors willing to mobilize the necessary investments in emerging technologies, thereby creating a strong demand signal to innovators and others capable of developing viable technological solutions.¹⁰²
- **Align climate and trade policies.** Trade and investment regimes have a large impact on how capital and goods flow. For too long, the worlds of trade and climate have been separated. Trade and investment regimes should be designed in a way that first movers do not only bear the costs of going first, but also reap the benefits of bigger markets and more robust competition.

Enhancing international cooperation and public-private partnerships

The transformative changes described here will not be imposed by internationally agreed action plans or orchestrated simply by setting global targets. It will require firms collaborating with governments, for when truly disruptive technologies are created, the risks are daunting for private firms to bear them alone. Such public-private partnerships are an opportunity for the public sector to provide the foundational capital or financial conditions necessary to support private-sector innovation.

International cooperation will be essential so that risks can be pooled and bigger markets for successful innovation and clean new products can be created. Cooperation can also revolve around removing regulatory barriers, supporting credible policy and creating common standards or joint declarations. At COP26, bold announcements were made of new partnerships related to switching to electric vehicles for whole countries, sending a credible signal to the world's suppliers that demand for new technology will grow substantially.

Strategies for enhancing international cooperation and public-private partnerships include:

- **Build international cooperation on compensation for loss and damage.** Providing financial and technical assistance to the countries that will be most affected by climate warming will be crucial.
- **Realize the geopolitical reality.** Deep cuts in emission will not diffuse around the world unless the United States, China, the EU and India find a way to engage and collaborate.
- **Scale mature technologies through cooperation.** Examples include demand alliances, removal of regulatory barriers and common standards that can help create larger global markets, and incentives to mass production and deployment (for example, common standards for electric vehicle plugs).



Nature-based solutions

More than half of the world's GDP is dependent upon nature and its services and is therefore at the risk of severe disruption.



According to the International Union for Conservation of Nature (IUCN), one-quarter of flora and fauna species are at the risk of extinction. However, presuming that protecting, restoring and safeguarding nature is merely an environmental question could not be farther from the truth. The World Economic Forum New Nature Economy Report series shows that more than half of the world's GDP is dependent upon nature and its services and is therefore at risk of severe disruption.¹⁰³

Three key trends are driving the agenda for nature-based solutions agenda:

- **Greater integration of climate change, biodiversity and land restoration goals.** Nature-based solutions may provide a third of the solutions to mitigate climate change; this prioritization strengthens when looking at climate adaptation particularly in poor countries with underdeveloped infrastructure. Companies will seek to invest in the protection and restoration of natural assets to compensate for their net-zero transition pathway shortfalls. Food and agriculture systems will especially provide a space where multiple environmental

and societal goals need to be addressed simultaneously to feed the growing population.

- **Greater pressure on the public sector to remove and repurpose harmful subsidies.** Two per cent of global GDP is estimated to be spent on environmentally harmful subsidies. There is an urgent need for intervention so that taxpayer funds are not invested in activities that harm public goods. This has huge implications for national budgets where it is not only about increasing the budget for environmental outcomes, but defunding harmful streams, such as subsidies on fossil fuel, overuse of chemical fertilizers and pesticides and water contamination.
- **Greater social equity and environmental outcomes.** Global resource extraction has tripled over the past 50 years, yet 840 million people still lack access to electricity.¹⁰⁴ Those who least benefit from modern lifestyles suffer the greatest impact of climate change and nature loss. Clashes and civil unrest will ensue unless these trends are reversed and issues of social and racial equity are put at the centre of the environmental movement.



Vision 2025

Unlocking private-sector investment in nature

A nature-positive pathway could generate an estimated \$10 trillion in new annual business value and create 395 million jobs by 2030.¹⁰⁵ To capture the \$10 trillion available in all nature-positive business opportunities by 2030 would require \$2.7 trillion per year of redirected funding through to 2030. Public-sector funds alone will not be enough. Private-sector financial flows are also needed to create better outcomes for nature.¹⁰⁶

To unlock private-sector investment in nature, progress needs to be made to:

- Defund nature-negative activities, particularly in commodity supply chains
- Increase financial flows for nature-based solutions
- Value nature for its intact habitats and ecosystem services

Living in harmony with nature

Earth Overshoot Day marks “the date when humanity’s demand for ecological resources and services in a given year exceeds what Earth can regenerate in that year”.¹⁰⁷ In 2021, this day was 29 July and it is arriving earlier every year, which means current populations are borrowing from future generations and jeopardizing their right to an environmentally safe and sustainable life.

Awareness has increased recently in all sections of the society that business as usual is no longer an

option. Lessons can be learned from the Indigenous and local communities that comprise less than 5% of the world’s population but protect 80% of world’s biodiversity.¹⁰⁸ Companies from across business sectors are working with initiatives like the Tropical Forest Alliance and 1t.org to halt commodity driven deforestation and protect and restore forests, respectively. Since the launch of 1t.org’s global pledge process in September 2021, over 30 companies have committed to conserve, restore and grow more than 3.6 billion trees in over 60 countries.

Enhancing policy coherence for environmental outcomes

More than \$700 billion a year is needed to reverse the global biodiversity crisis.¹⁰⁹ However, conflicting incentives in governments’ fiscal, economic, finance, trading and development cooperation policies are a serious concern. For example, according to a report from the United Nations Development Programme and the Food and Agriculture Organization, almost 90% of the \$540 billion in annual farming subsidies are harmful.¹¹⁰

Signs indicate that society may be locked into a system that put us on a path that is nature-negative. At COP26 in Glasgow, nine multilateral development banks “launched a joint statement outlining actions that they will take to mainstream nature into their policies, analysis, assessments, advice and assessments in line with their respective mandates”.¹¹¹ By 2025, increased cross-sectoral policy coherence and alignment of public- and private-sector financing start to create environments that unlocks funding to support nature-positive approaches.

“ A nature-positive pathway could generate an estimated \$10 trillion in new annual business value and create 395 million jobs by 2030.

Pathways to Vision 2025

Implementing nature-positive business models

Strategies for operationalizing this pathway include:

- **Understand, value and disclose impact and dependency on nature.** This will help prevent risk mispricing and inaccurate capital buffers to both short-term risk events and more chronic impacts. Nature-related risks can be incorporated within existing ERM and ESG processes, investment decision-making, and financial and non-financial reporting.¹¹² Many large companies have joined the Taskforce for Nature-Related Financial Disclosures to help build out a framework like climate-related financial risks.
- **Adopt nature-positive strategies.** Nature-positive strategies should be a normal part of decision-making, in that they are understood to enable greater competitiveness and resilience. Over the past decade, the MSCI Emerging Markets ESG Leaders Index outshone the broader MSCI Emerging Markets Index, with annualized gross returns of 6.3% versus 3.0%, a clear reflection of the profitability of ESG investing.¹¹³ Moreover, the 2016 Cone Communications Millennial Employee Engagement Study found that most millennials, who will make up 75% of the job market by 2025, will not take a job with a company that lacks social responsibility values.¹¹⁴
- **Lead and innovate to fast-track revenue-generating investments in nature.** Corporates can shift their procurement rules and supply



chain investments to value nature-positive opportunities over harmful ones. Banks and investors, including multilateral development banks, can decline unsustainable business while providing capital, de-risking investments and creating asset classes for nature-positive projects.¹¹⁵ Deforestation, for example, can be a result of corporate supply chain and procurement decisions but also of financial institutions' decisions.¹¹⁶ Approximately \$238 billion in credit was provided by banks and other financial institutions to deforestation-related commodity companies between January 2016 and June

2021.¹¹⁷ The private sector and corporate and financial organizations all have a critical responsibility to increase investments in nature.

- **Join existing initiatives.** For much of these global commons' challenges, there is no level playing field or clear rules of the game. Solving for these challenges requires greater public-private dialogue and precompetitive collaboration among committed actors. The success of proposals such as payment for ecosystem services, high-integrity carbon markets and deforestation-free supply chains depends on

multistakeholder collaboration. Businesses should therefore look for a systems agenda by working together for a change that runs across the industry and economic segments. For example, World Economic Forum initiatives like the Tropical Forest Alliance and 1t.org.

Creating an enabling policy environment

Strategies for operationalizing this pathway include:

- **Enact policies to protect nature and reform subsidies to value and provide public goods.** In most cases, current economic and financial norms and institutions do not consistently value and create a positive financial return for nature-positive investment.¹¹⁸ According to a United Nations 2021 study, of the \$540 billion agricultural subsidies per year (15% of total agricultural production value), 87% is price-distorting and environmentally and socially harmful.¹¹⁹ This means that, ultimately, environmentally harmful actions are often supported with public

resources, making them cheaper and more competitive than nature-positive investments in the short term.¹²⁰ This must change.

- **Price externalities and support blended finance.** Formal pricing mechanisms for carbon and ecosystem services, and blended finance approaches to crowd-in private-sector investment need to be created. For example, the Inter-American Development Bank partnered with the Global Environment Facility to establish a \$5 million Climate-Smart Agriculture Fund for Latin America and the Caribbean. The fund offers risk-tolerant capital with long tenors to encourage private investment by cushioning early losses and providing a concessional tranche of resources.¹²¹ Another example can be seen in South Africa, which introduced a first-of-its kind biodiversity tax incentive into its legislation. The tax incentive allows landowners such as farmers or communities, who commit to setting aside and managing their land as protected areas, to receive a fiscal benefit. It is estimated to contribute close to 10% additional finance in closing South Africa's biodiversity finance gap.¹²²



Net-zero transition

Transforming net-zero commitments into tangible company-level action with transparent metrics that can be monitored and evaluated has never been more urgent.



With only eight years to achieve a 50% emission reduction target by 2030, transforming net-zero commitments into tangible company-level action with transparent metrics that can be monitored and evaluated has never been more urgent. COP26 in Glasgow saw a groundswell of corporate net-zero commitments and over 1,000 companies have logged 1.5° C-aligned targets.¹²³ Yet business leaders across all sectors are struggling to demonstrate tangible results and measuring impact against targets through accountability mechanisms.

The three emerging trends to consider when advancing corporate action on net zero are:

- **Increasing accountability is critical.** While leading companies have adopted net-zero targets, they are as yet unable to elaborate credible plans for transitioning to net zero. In the absence of plans and transparent mechanisms for tracking progress, corporate commitments will continue to face scepticism and greenwashing concerns.

- **Radical collaboration is essential to close the 2030 ambition to implementation gap.** Current net-zero measures are not matching the speed and scale of the climate crisis and continuing with business as usual will not move the needle fast enough. Delivering critical 2030 milestones will require radical collaboration, sequenced interventions between industry, government, finance and technology and a tangible pipeline of bankable projects aimed at scaling up critical components of the transition, including transition fuels, infrastructure and production facilities.
- **Investment must rapidly scale up.** Clean energy investment must triple by 2030, to \$4 trillion.¹²⁴ At the same time, emerging technologies must be brought to market and significant R&D funds are required for these technologies to reach commercialization.

The World Economic Forum Global Future Council on Net-Zero Transition has identified two critical thematic priority areas to address the tipping points and advance solutions to reach net zero by mid-century.



Vision 2025

Increasing net-zero accountability

Just before COP26, the Intergovernmental Panel on Climate Change released its latest assessment report, which warned about getting closer to a series of climate breakdown tipping points. Following COP26, a range of analysis was produced that illustrated the importance of implementing the pledges made. The Global Future Council on Net-Zero Transition will focus on delivering a framework for business leaders to follow and developing a common set of net-zero metrics that may be integrated into corporate governance models and ESG principles.

Defining net-zero pathways

- Strategy: Corporate net-zero strategies must be tailored to their industry and region of operation. Certain industries have more complicated value chains and operations that are highly energy intense with few lower carbon alternatives. Hence it is not always easy to define the net-zero pathway. At the same time, countries face similar challenges as they need to assess impacts on the economy, job security and geopolitical aspects.

- Targets: Uncertainties include the availability of technologies, abatement costs, consumer behaviour and perception, and a lack of data.
- Collaboration: Value chain collaboration, supported by government policy, is key to address value chain emissions. Value chains are often cross-border, therefore a systemic approach is needed. Coalitions such as the global Race to Zero campaign can help.

Standardizing accounting and reporting

- Data harmonization and standards: No standardization or common metrics across industries and value chains exists. Harmonization is necessary to enable the flow of information and the measurement of Scope 1, 2 and 3 emissions, without double counting.
- Accounting and reporting: Climate accounting and reporting is voluntary in most countries. Collecting emissions data, summarizing findings and reporting their GHG inventories can be challenging for actors with long or complex value chains, given varying data quality and double counting.

“ Data harmonization is necessary to enable the flow of information and the measurement of Scope 1, 2 and 3 emissions, without double counting.

“ **Net-zero action in the hard-to-abate industry sectors that account for 30% of global GHG emissions is critical to lowering emissions.** ”

Choreographing the net-zero transition

Net-zero action in the hard-to-abate industry sectors that account for 30% of global GHG emissions is critical to lowering emissions. Existing institutional frameworks and processes are not adapted to the scale and urgency of the challenge. To achieve the step-change needed, collaborative choreography must bring industry, government, financial institutions and other stakeholders together around tangible interventions. The Council has identified two key challenges in this area:

A clear vision of decarbonization 2030 milestones

- For action to be efficient and effective, a more granular and clear-eyed understanding of the scale of the short-, mid- and long-term goals industry sectors must deliver by 2030 is necessary. This vision will shift the conversation and focus on the scale of interventions and the choreography required from leaders of industry, governments, financial institutions and other stakeholders.
- The Mission Possible Partnership has identified critical industry 2030 milestones:¹²⁵
 - 70 (near) zero steel plants producing 280 metric tonnes of steel annually

- 900,000 zero-emission trucks on European roads with at least 290,000 charging points and 2,500 refuelling stations
- Over 300 sustainable aviation fuel (SAF) plants (50 of them in the EU) producing approximately 30 million tons of SAF to achieve a 10% share in global jet aviation fuel supply
- 10 green corridors or approximately 100 deep sea zero-emission propulsion ready ships to ensure zero-emission fuels comprise 5% of international shipping fuels and 15% of domestic shipping fuels

A net-zero choreography

- Creative thinking can identify the collaborative models for radical action and collaboration to respond urgently to the crisis.
- Sectoral transition strategies and plans must be used as a basis for a pipeline of bankable net-zero projects.
- Sequenced interventions by government, industry, finance, technology and other key stakeholders are needed to mobilize the green capital and technologies required for bankable net-zero projects.



Pathways to Vision 2025

Integrating strategy, measurement and reporting

Immediate action must be taken to limit global warming to below 1.5° C. This can only happen when climate action is integrated in all business and government decisions.

Strategies for operationalizing this pathway include:

- **Set the strategy.** Countries are encouraged to update their Nationally Determined Contribution, alongside long-term goals. Companies, on the other hand, need to include Scope 3 emissions in their climate strategies

and address emissions across their value chain. Both countries and companies need to establish long-term and interim targets that are ambitious and comprehensive. Targets need to be science-based, for example via the Science Based Targets initiative.

- **Report and disclose emissions.** The need has increased to monitor and track progress against net-zero commitments, including effective carbon accounting, implementation plans and management strategies. Data disclosure is key to ensure staying on track, for example using guidelines from the Task Force on Climate-related Financial Disclosures, and via CDP.



“ Ambitious companies should put pressure on industry bodies and other organizations to establish sector-level targets for climate action.

Synchronizing action to support projects, policy, demand and finance

In the global choreography efforts, five crucial areas must be considered: the supply side, demand side, finance, policy-making and a just transition. Value chain collaboration supported by government policy is key to address value chain emissions. Ambitious companies should thus put pressure on industry bodies and other organizations to establish sector-level targets for climate action. Leading companies can also join forces with cross-sector policy groups to change the wider context for decarbonization across value chains. Common policy recommendations provide a strong message that business wants support to decarbonize.¹²⁶

Strategies for operationalizing this pathway include:

- **Coordinate movement across each of these levers:**¹²⁷

- Strong demand signals for greener products
- Supply scaling to meet that demand
- Public and private finance to facilitate the transition to cleaner supply
- A policy framework that mainstreams that shift from niche, premium markets to the wider economy and brings in or trains workers with the skills and protections needed to deliver the transition, while caring for those unable to transition
- **Join initiatives that address these challenges.** Some efforts, such as the Race to Zero Campaign and the First Movers Coalition, are partnerships with governments, while the Mission Possible Partnership supports sector-level targets and cross-industry collaborations.
- **Spread the message.** Becoming a climate leader in the region or industry, spearheading initiatives and supporting projects that lead to a competitive advantage towards the transition are key.



2.6

SDG investment

The goals of the 2030 Agenda require concerted global stakeholder cooperation.

Two years into the decade of delivery, the financing gap that must be closed to achieve the SDGs remains large. Indeed, according to the Organisation for Economic Co-operation and Development (OECD), the global financial impact of COVID-19 has caused the SDG financing gap to grow from \$2.5 trillion annually to \$3.7 trillion.¹²⁸ At the same time, the pandemic has also highlighted the ominous and uncontrollable power of nature. As a result, the past two years have represented a milestone in the financial world, witnessing the flourishing of sustainable finance that is becoming increasingly mainstream. While there is still time to meet the Agenda 2030 for sustainable development, some trends that are shaping the SDG investment ecosystem are encouraging, while others are less so.

- **SDG mainstreaming.** Though ESG metrics are becoming embedded in portfolio management and financial decision-making, the SDGs are increasingly seen by a few categories of investors as a key measure of investment impact.

- **Integration of just-transition logic in development and climate finance.** While the net-zero transition has been the main catalyst for investment and sustainable and development finance, the COVID-19 pandemic has spurred greater emphasis on ensuring a just and inclusive transition.
- **Public-private cooperation and financing roadmaps.** The private sector continues to increase investment and financing in the SDGs. To scale this investment to reach the trillions required to bridge the financing gap, the public sector has stepped in to facilitate and de-risk these investments by providing non-financial interventions, blended finance and clear financing pathways.

The fragmentation of efforts and activities has been an enduring feature of development finance. Only through a concerted, global effort of cooperation among all relevant stakeholders can the goals of the 2030 Agenda for Sustainable Development be achieved.

Vision 2025

Mobilizing private capital for emerging markets

The SDGs are intended to embody a global vision for a sustainable, inclusive and equitable world. The amount of investment required to meet such an ambitious objective is substantial. A shift of 1.1% of the \$379 trillion assets managed globally towards the SDGs could bridge the \$3.7 trillion financing gap.¹²⁹ Public finance alone cannot solve the issue. The private sector will be critical to the realization of the SDGs.

By 2025, the private sector should increase efforts to fill the investment gap needed for meeting the SDGs, deployed closer to the speed and scale required. This mobilization is also not happening where it is most needed: in emerging and developing countries. Concerted effort is made by all stakeholders to address key issues undermining the SDGs:¹³⁰

- The risk profile of these economies often viewed unfavourably by investors due to macroeconomic, institutional and political factors, and information asymmetry exacerbates this situation.
- Many large institutional investors perceive limited investments in climate-vulnerable economies, for example in small island developing states.
- Transparency and clarity around projects and outcomes are lacking.

Integrating social factors into climate and transition finance

The climate and energy transitions have been the main focus of sustainable and development finance since the adoption of the Paris Agreement on climate change in 2015. Similarly, the “E” in ESG has been the focus of mainstream investors in search of sustainable investments. As a result, other SDGs such as SDG 1 (no poverty), SDG 2 (zero hunger), SDG 8 (decent work and economic growth) or SDG 10 (reduced inequalities) have received relatively less attention, and less funding.

By 2025, there is greater understanding about climate change and social development being two global, intertwined and equally important challenges: solving one without addressing the other will fail to deliver an economy and a society that works for all. Investor strategies to transition to a more resilient and sustainable economy incorporate the full range of ESG dimensions of responsible investment, supporting an inclusive and just framework for all people and communities.¹³¹ The SDGs offer a solid framework to incorporate these principles into their climate and transition strategies.

Harmonizing disclosure and measurement

As investors turn the SDGs into a new asset class, the resulting plethora of impact measurement systems and reporting tools has created fragmentation, lack of transparency and inconsistency. According to an analysis conducted by the World Economic Forum Global Future Council on SDG Investment, only 3 of the 15 most prominent impact measurement and management frameworks are mapped to the 17 SDGs. This situation can expose companies and investors to accusations of green- and sustainability-washing.

By 2025, nascent efforts to create international standards, such as the newly created International Sustainability Standards Board, the development of a European taxonomy for sustainable activities, or the G7 Impact Taskforce, provide clearer indications and definitions for investors and decision-makers, setting the foundations for the sustainability architecture that will accelerate the transition to a net-positive and just economy. This architecture respects the diversity in the global markets and does not channel money away from where it is most needed. To ensure this, regulations should avoid restrictive propositions that impede the flow of capital towards emerging markets or measurement systems that favour developed countries over developing ones. At the same time, regulations encourage and foster investments that generate financial additionality and support transition efforts.

“ A shift of 1.1% of the \$379 trillion assets managed globally towards the SDGs could bridge the \$3.7 trillion financing gap.



Pathways to Vision 2025

De-risking emerging and developing countries for private-sector participation

To unlock greater capital for sustainable development in emerging and developing economies, it is imperative to address the real and perceived risk concerns of the private sector. Adopting a broader, more comprehensive and macro approach towards risk is needed by all actors across the investment value chain.

Strategies that can serve this purpose include:

- **Leverage blended finance.** The use of catalytic capital from public or philanthropic sources to increase private-sector participation has been in place for a certain time. However, the actors involved have been slow in adopting the necessary changes required to bring it to scale and make it a mainstream approach for

private investors.¹³² While development finance institutions and multilateral development banks have played a strategic role in the development pathways, they have been slow in adapting to changing markets and contexts and may crowd out greater private-sector involvement. However, they continue to and can increasingly play a key role in lowering risk and crowd in greater private-sector involvement.

- **Improve non-financial de-risking measures.** Risk mitigation predominantly has been understood in the deployment of financial risk-sharing instruments, such as guarantees, first loss facilities and insurance, to transfer part of the risk premium associated with specific transactions. However, risk mitigation needs to be understood beyond financial risk mitigation products, towards a broader concept of non-financial risk mitigation measures and in improving overall investment climates for increased private-sector participation.¹³³



Creating pathways for SDG investment

The trillions needed to finance the 2030 Agenda must bring together public- and private-sector finance, but real and perceived risks to investment prevent greater private-sector involvement in emerging and developing economies. This is partly due to the lack of clear strategies and pathways that define and highlight the solutions, actors and actions needed to address both the non-financial and financial risks and barriers that currently prevent greater SDG investments.

- **Join the Sustainable Development Investment Partnership (SDIP).** The SDIP has developed the Sustainable Investment Pathways (SIP) initiative to bring together global and local public- and private-sector

market players to jointly define the actions required to increase the sources of capital needed to finance meeting the SDGs through an impartial, multistakeholder approach. The SIP initiative can support market players to:

1. Outline risks and barriers preventing greater coherence and investment in the sectors or value chains where greater sustainable investment is needed
2. Identify the policies, innovative solutions and financing mechanisms to build a more coherent and collaborative SDG investment ecosystem in these sectors or value chains
3. Decide and agree collaboratively on the “who and what” actions to be taken to complete the formulation of an actionable SIP



“ Investors should adopt impact management principles, including impact measurement and disclosures, and encourage investee companies, projects and funds to report on harmonized impact metrics.

Raising ambition through public-private cooperation and partnerships

Commitments and sector-specific alliances calling for a more sustainable-oriented financial sector have thrived in recent years. The Global Future Council has been working with international organizations and private-sector actors to launch a new call to action towards the SDGs: the SDG Club. This call to action aims to provide practical recommendations to remove current obstacles and bring together disparate labels, such as ESG and impact investing, with the goal of helping asset allocators make the right decisions on the “how and what” of investing in the SDGs. The initiative seeks to have 1% of global investable assets committed to SDG investing, a number that could bridge the SDG gap.

Actionable recommendations include:

- **Promote an SDG investing label.** Using this label would allow asset allocators to know that they are part of the global movement to invest in solving key global challenges but also to leave them discretion on which of the SDGs to focus on.
- **Overcome the perception that SDG investing does not generate returns.** Publishing reliable data on commercial returns from SDG investing, including the track-record of development finance institutions and private impact investors, will make clear that impact and returns are not incompatible strategies.
- **Adopt impact management principles.** Investors should adopt impact management principles, including impact measurement and disclosures, and encourage investee companies, projects and funds to report on harmonized impact metrics, so that asset allocators can obtain improved data and compare across their investments.

Sustainable tourism

Tourism stakeholders can redesign sustainable destinations and practices across services and businesses.

Although the tourism industry has been hit hard by COVID-19, its hallmark resilience is expected to foster its recovery. The prior decades' tourism boom has challenged its sustainability, with overcrowding and the carbon footprint of flying remaining top public criticisms.

In the wake of the COVID-19 pandemic, key trends that have amplified the need for swift and collective action include:

- **Equitable and sustainable destinations.** Overcrowding, mismanaged growth and the degradation of natural and cultural assets harmed the tourism sector prior to the COVID-19 pandemic. Furthermore, benefits from tourism were not adequately distributed to local economies and across the value chain.
- **Value of the blue and green economy.** Travel and tourism investments and behaviours have not adequately accounted for the value of the natural environment. Clear quantification of

both the inherent tourism and economic value of protected areas and natural assets will be crucial to preserving the long-term value of tourism to business and customers alike.

- **Climate change action.** Global industry has seen raised awareness and acceptance of the urgency of climate action. Without adequate action and investment, climate change could disrupt the travel and tourism sector as it becomes particularly vulnerable to climate impacts.

As the tourism industry recovers, stakeholders can redesign sustainable destinations and practices across services and businesses. The World Economic Forum Global Future Council on Sustainable Tourism evaluates the conditions, metrics and policies needed for the success of progressive business models that place sustainability at the core and provide expert guidance to the broader sector on how to build forward better.



Vision 2025

Ensuring equitable and sustainable destinations

Over the past 50 years, the number of international travellers grew from 200 million to 1.5 billion.¹³⁴ As a result, many locations have struggled with overtourism, while others have struggled to attract visitors and their capital for local conservation and local communities. Furthermore, tourism marketing and the rise of social media have only served to further stretch carrying capacity of many of the most popular tourist destinations. Tourism marketing and management therefore must evolve to enable a sustainable future, with some conditions from the COVID-19 crisis being conducive to an acceleration of sustainability practices and outcomes.

Consumer behaviour can drive demand and shift practices in travel and tourism, but a lack of transparency and sufficient knowledge exchange within the industry hinders coordinated progress. Tourism organizations often struggle to determine which benchmarks or metrics to follow, and consumers have difficulty navigating and understanding relevant certifications. Smaller, locally-based operators or tourism businesses are not well-enough resourced to adopt practices, achieve certification or be appropriately compliant.

A rising demand for better tourism practices and services could be leveraged to build more equitable and sustainable destinations, capturing capital and value accordingly.



Investing in the blue and green economy

The tourism sector has long depended on the resources, beauty and economic activity associated with natural environments. Coastal, forest and mountain environments have served as popular tourist destinations, and their popularity has only increased during the pandemic where customers have sought out nature-based locations and experiences.

Unfortunately, the true value and contribution of the blue and green economies to and from tourism have

not been accurately measured or considered in their totality. Protected areas can provide a five-to-one return on investment in direct revenue and have a variety of benefits that are not captured by the market. Furthermore, there is potential for nature-based solutions to drive change in tourism as well as contribute directly to broad economic efforts to decarbonize and align with the SDGs. According to the *EU Blue Economy Report 2021*, in the EU27 alone, the blue economy provides 2-3% of total employment and 1.5% of GDP, excluding indirect or induced income and employment. New sectors such as blue biotechnology, algae production and ocean renewable energy are expected to generate new green jobs and markets.¹³⁵



Aligning the travel and tourism sector with the climate ambition

Achieving net zero requires decision-making from the highest levels, a coordinated plan across the public and private sectors, and appropriate financial and supporting mechanisms to achieve the necessary transition. Given the diversity of the sector, however, net-zero pathways differ by industry vertical. Foundational work by the

industry was undertaken for COP26, which delivered a broad framework for achieving net zero in the sector.¹³⁶ Several corporations have now committed to net zero and signed up for science-based targets, but this remains a small fraction of the entire supply chain and does not extend to many SMEs.

By 2025, all tourism stakeholders commit to science-based targets and design their own net-zero pathways.

Pathways to Vision 2025

Aligning on global principles for sustainable destinations

To ensure a coordinated response that prioritizes the rebuilding of the sector in an equitable and resilient manner, significant alignment among stakeholders across the ecosystem will be required.

Strategies for operationalizing this pathway include:

- **Develop a shared vocabulary.** Design a coherent set of principles for sustainable destinations that will drive the behaviour of businesses, governments and travellers alike.¹³⁷
- **Demonstrate best-in-class innovations.** Valuable examples already exist of cities, regions or countries that have adopted practices that preserve culture and natural resources, calibrate services and assets, and incentivize responsible

tourism behaviours. These can be showcased to enable appropriate shifts in business, policy and consumer choices.¹³⁸

- **Reshape public policy.** The crisis offers a reset opportunity; many destinations are considering taking action now or accelerating their plans for long-term sustainable destination management and the Global Future Council is working on tools and guidance for experts.

Making the case for the blue and green economy

The inherent economic value of the blue and green economies is invaluable across geographies and industries, but the need to highlight and stress the opportunity to apply blue and green economy principles to the tourism sector is still great.

“ The inherent economic value of the blue and green economies is invaluable across geographies and industries.

“ Nature-based solutions, while addressing some of the most pressing biodiversity and climate change challenges, can drive tourism demand and revenues.

Nature-based solutions, while addressing some of the most pressing biodiversity and climate change challenges, can drive tourism demand and revenues. Practical guidance from industry leaders, such as the Global Future Council, could broaden and accelerate the true valuation of natural assets and thus mobilize and scale the necessary investment into blue and green economy innovations.

Strategies for operationalizing this pathway include:

- **Shape sustainable consumer behaviours.** Travellers demand more sustainable tourism yet have a hard time knowing what to expect from businesses or what actions will really have impact. The Global Future Council is developing a set of behaviour changes, based on its work on destination principles.
- **Provide practical guidelines for investment decision-makers.** The business case for investment in blue and green economy initiatives for the travel and tourism sector should be articulated across stakeholder groups.¹³⁹
- **Advance global sustainability initiatives through tourism.** The global reach and importance of the tourism industry can be leveraged to further the application of blue and green economy principles.

Advancing pathways to net zero

The development of clearly defined pathways to net zero and measurement to track progress are key to shifting the sector's trajectory and avoiding aggressive regulation down the track. However, for many organizations newly embarking on a

journey of aligning with science-based targets, it is difficult to determine where to start, which initiatives to prioritize, and how to measure progress and impact. It is therefore crucial for experts and leaders in the sector to highlight best practices, socialize well-respected methodologies and mechanisms for measurement, and facilitate transparency and accuracy in reporting.

Strategies for operationalizing this pathway include:

- **Gather more commitments towards net-zero and metrics reporting.** Experts can serve as champions for a net-zero future by encouraging the proliferation of efforts and commitments to climate action by many stakeholders. Existing work on metrics and science-based targets can be built upon to facilitate progress, consistency and transparency.
- **Highlight the role that tourism can play in building resilience in destinations.** As more businesses commit to reducing their carbon footprint or reaching carbon neutrality, tourism can play a large role in valuing nature-based carbon offsets and other benefits they bring to destinations. This also intersects with work done by the Friends of Ocean Action and its Mangroves Working Group.
- **Emphasize public-private collaboration to accelerate the energy transition.** Collaboration across various tourism bodies should be encouraged, and impactful collaborations across the value chain that can accelerate action can be identified or highlighted. Work done by the World Travel & Tourism Council, the Science Based Targets initiative and the UN High-Level Champions serve as powerful foundations from which to build such cohesion and collaboration.



An aerial, high-angle photograph of a busy city intersection. The scene is dominated by dark asphalt roads and white zebra crossings. Several pedestrians are captured in motion, crossing the streets. Their shadows are cast long and dark on the pavement, indicating a low sun position. The overall composition is dynamic, with the geometric patterns of the crossings and the scattered movement of people creating a sense of urban activity.

3 Society

Education and skills

The skills required to thrive in the post-COVID-19 economy include innovation and creativity, global citizenship and civic responsibility, and interpersonal and intrapersonal skills.

COVID-19 highlighted gaps in learning needs and presented an opportunity to reassess them. An especially high value is now being placed on human-centric skills that cannot be easily automated, and there is newfound urgency to improve access to skills for an increasingly automated world. The Great Resignation trend resulted from workers seeking greater meaning and value from their jobs, and now employers struggle to find talent.

Three key trends are driving the need for a new education and skills agenda for the post-pandemic economic recovery:

- **Unemployment and widening skills gaps.**
Employers struggle to find talent with the right skills due to the Great Resignation, new immigration restrictions and limited labour mobility. Additionally, reskilling and upskilling efforts have not kept pace. Competition among employers for talent has increased bargaining power for employees, and churns in job markets further exacerbate skills gaps in the labour market.

- **Unequal access to skills development.**
As the global pandemic continued to force learning to shift online, new modalities of learning were being piloted and disseminated, but uneven digital access further exacerbated existing education and skills gaps between low- and high-resourced communities.
- **Limited recognition of skills pathways.**
Online credentialing, apprenticeships and non-formal learning exist, yet these pathways are not broadly and equally recognized by employers. The lack of systemic recognition of alternative learning pathways became a challenge in the pandemic context, where individuals required more flexible and rapid forms of skilling to be able to keep pace with changing labour-market demands.

Actors need to rapidly address these short-term challenges to create resilient systems to meet the employment needs of individuals, businesses and governments.



Vision 2025

Developing new economy skills

The skills required to participate and thrive in the post-COVID-19 economy include innovation and creativity, global citizenship and civic responsibility, digital literacy, and interpersonal and intrapersonal skills.¹⁴⁰ The 2030 vision in education and skills systems is that every individual, regardless of background, location or demographic, can access the tools needed to hone their skills. This has proven to be a challenge since the COVID-19 pandemic has forced learning to shift online, casting a new light on the digital divide and driving a further gap between developed and developing economies.

Accelerating the vision within this domain will require targeted training and development for educators to support the right kind of learning; curricula developers to strategically integrate new economy skills into learning; workplace-learning opportunities to be made widely available; and all stakeholders – including educators, employers, human resources technology, education technology, employment offices and others – to align on skills pathways. To ensure that these goals are met by 2030, policy-makers must

prioritize teacher workforce training and development as an enabler of high-quality education systems.

Measuring new economy skills

As individuals gain and hone new economy skills, stakeholders will need to track these skills to make informed decisions about human capital management. Better data are needed to be able to match people to jobs and learning opportunities, and to ensure that learning ultimately leads to employment. Several indicators must be measured, including the mastery of these skills across different demographics, and gaps in access to skills training and development. Furthermore, new mechanisms are needed to assess the relevance of curricula to labour-market needs.

The Vision 2025 is of data collected from assessment, and measurement is used strategically to create direct lines between job seekers and employment opportunities. New methods of assessment must be applied to measure new economy skills, and the development of new

“ Better data are needed to be able to match people to jobs and learning opportunities, and to ensure that learning ultimately leads to employment.



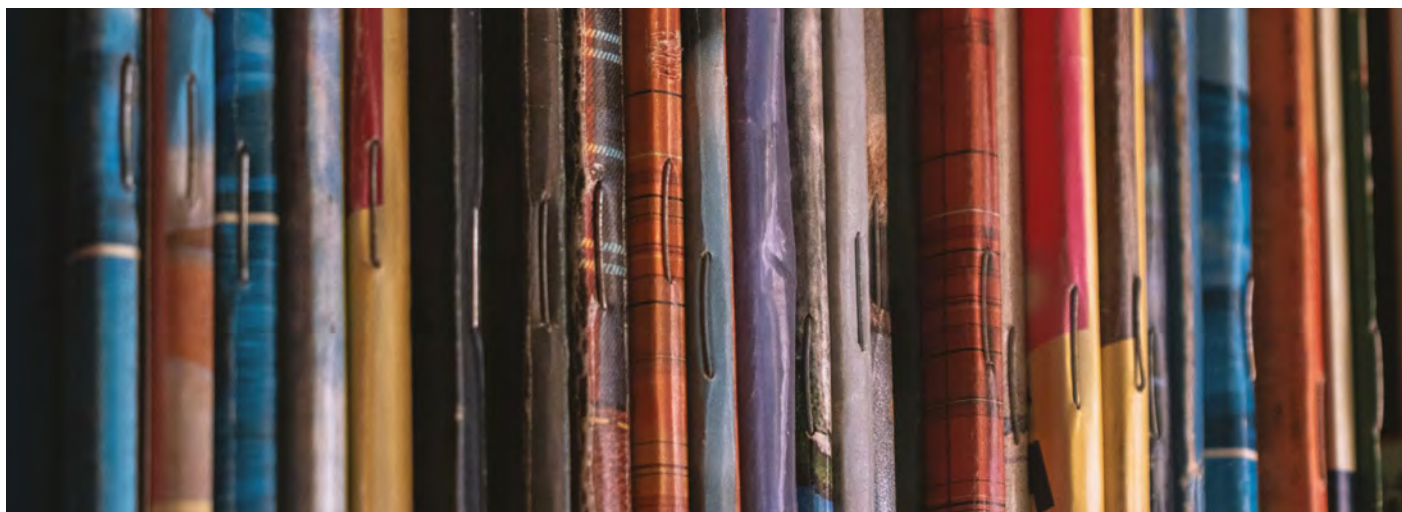
assessment mechanisms often takes many years to design and implement. Thus, a reasonable priority for the vision would be to – in the first instance – measure gaps and inequities in access to skills development across different demographic groups.

Mainstreaming new economy skills

Education systems have long been embedded in traditional ways of learning, which often include direct instruction of well-established subjects, such as mathematics, reading and writing. Yet these systems could be complemented with

new skills and new approaches to learning. Innovating approaches will require fundamental shifts in norms and attitudes related to learning.

The vision is that individuals proactively engage in lifelong learning to develop their new economy skills. Enabling this vision will require these skills to be valued by employers and governments. Stakeholders will need to signal demand for new economy skills, develop and recognize alternative pathways to employment, and invest in targeted skills development and deployment for groups with inequitable access to learning and jobs. While all of these can be accomplished by 2030, a priority for the Vision 2025 should be to develop and implement alternative pathways to employment.



Pathways to Vision 2025

Providing education workforce training and development to support new economy skills development

A survey of industry employers shows that the core set of skills required for employment in the education sector is set to change by 41% by 2025.¹⁴¹ Another study indicates that wide-scale investment in upskilling the education sector alone could add 5.6% (nearly \$400 billion) to global GDP.¹⁴² The return on investment in teacher training is multiplied if focused on reinforcing the education workforce to support new economy skills development for the next generation of talent. Furthermore, investing in teacher training and development ensures that education systems continue to be resilient through any future unforeseen social and economic shocks.

Strategies for operationalizing this pathway include:¹⁴³

- **Assess skills gaps in the education workforce.** This will support robust workforce planning within this sector, including a combination of qualitative and quantitative approaches to understand specific teacher needs.
- **Provide opportunities for educators to observe how skills are deployed in work contexts.** These opportunities would enable teachers to create learning environments that more closely mirror the future of work. This will require specific partnerships between schools and local employers and could be carried out through business commitments to ESG standards.

- **Create educator-owned lifelong learning, training and development accounts.** Along with a centralized database of diverse opportunities for teacher development, these accounts would enable educators more flexibility and ownership over their learning needs.

Recognizing alternative and work-based pathways to jobs

Many mechanisms for developing new economy skills, including online learning and short-cycle credentialing, have emerged in response to the growing demand for learning and reskilling. These mechanisms promise to democratize learning, increase access to a broader set of individuals and provide rapid solutions to learning needs. Although apprenticeships and other forms of work-based learning have proven to be effective pathways to employment, these strategies have not been widely adopted across economies and are not always recognized by employers, which places the burden of risk on individuals as they decide whether to invest in these alternative pathways.¹⁴⁴

To encourage individuals to engage in lifelong learning of new economy skills and take advantage of alternative learning solutions, these learning pathways must be recognized by governments and employers.

Strategies for operationalizing this pathway include:¹⁴⁵

- **Help businesses and governments create and formalize work-based learning.** Government subsidies can facilitate and encourage the creation of these opportunities.
- **Consider candidates with skills-based certifications, where applicable.** The candidates to consider particularly are those engaging in mid-career transitions.

“ Wide-scale investment in upskilling the education sector alone could add 5.6% to global GDP.

“ Tracking the development and deployment of new economy skills across traditionally under-represented and minority groups can support an equitable economic recovery.

- Include skills certifications and micro credentialing in national qualifications frameworks.
- Require work-based learning in national curricula.
- Co-design work-based and online learning assessments. Supporting skills development aligned to labour-market needs is required.
- Develop signposting tools to help individuals understand their skill set and the skills that are needed for employment. Such tools should help overcome the information barrier for individuals.

Measuring gaps and inequities on the attainment of these skills

Tracking the development and deployment of new economy skills across traditionally under-represented groups, including women, individuals

with disabilities, ageing populations, and those from ethnic, racial and religious minority groups, can support an equitable economic recovery. Having these data points can empower stakeholders to think critically about the targeted efforts needed to ensure equal access to new opportunities created in the post-COVID-19 economy.¹⁴⁶

Strategies for operationalizing this pathway include:¹⁴⁷

- **Create skills passports at the company or country level.** Passports can include demographic data to track new economy skills across under-represented groups.
- **Measure engagement in new economy skills learning opportunities.** These data can be used to identify and solve for potential barriers to access across demographic groups.
- **Track the number of individuals across demographic groups.** Tracking those who enter jobs powered by new economy skills will help ascertain whether the skills are deployed equitably.



Equity and social justice

Recovery from the pandemic provides an exceptional opportunity to build new, just systems that honour the dignity and equality of every human being.



The COVID-19 pandemic has aggravated pre-existing inequalities globally and heightened the visibility of deep-rooted structural and social inequities in education, employment, housing and healthcare. The issues faced by people across the dimensions of diversity vary and are often further complicated by their intersectionality. The increased mobilization and momentum for change, however, have not translated into progress in building systems that are truly more equitable and just.

Two key trends are both challenging and contributing to more equitable and socially just societies:

- **Deepening and exposing inequalities.** COVID-19 has laid bare and deepened already

existing inequalities in society. Increased social unrest and disruption heightens the global demand for change.

- **Addressing the gap between commitments and progress.** Organizations and institutions repeatedly negotiate the tension between intentions and progress while building systems that are truly more equitable and socially just.

The recovery of economies and societies from the pandemic provides an unprecedented occasion to leverage intentional, coordinated multisector actions, driven and measured by data to build new and just systems that honour the dignity and equality of every human being.



“ Investing in the lifelong employability of all workers ensures social welfare but is also critical for business by addressing the skills gap and building a resilient labour market.

Vision 2025

Providing underserved groups with job access, skills and growth opportunities

The COVID-19 pandemic is wreaking havoc on global economies, disrupting supply chains and causing labour shortages. In developed economies, retiring workers or those voluntarily quitting roles are said to be the cause of the shortage, but issues such as border controls and immigration limits as well as demands for better pay and flexible working arrangements are also contributors.¹⁴⁸ Despite this opportunity for jobs, racial, ethnic, age, gender and education-level unemployment gaps, among others, still exist. Only structural changes to institutions, policies and mindsets will lead to true equality of opportunity in the labour market. Investing in the lifelong employability of all workers ensures social welfare but is also critical for business by addressing the skills gap and building a resilient labour market.

The composition of the economy is changing, labour markets are undergoing fundamental transformations and new job roles are emerging, shifting the skills businesses need to innovate and grow. While these shifts hold the promise of more rather than less work for people, significant gaps are already evident in many of these growing fields for under-represented groups. Structural changes, including degree requirements, the recruiting process, on-the-job training, and hiring for all dimensions of diversity, will build a resilient and equitable labour market.¹⁴⁹

Supporting business activism through inclusive metrics and reporting

Globally, 90% of businesses claim to prioritize diversity, yet many are falling short on making progress towards creating more equitable work environments for all employees.¹⁵⁰ For many institutions and organizations, the wave of change is coming in the form of ESG requirements.

Governments, financial Institutions and the public at large are demanding increased transparency and accountability around setting goals and reporting progress against ESG targets, particularly on the social agenda. Measuring and reporting on DE&I efforts inclusively means engaging a wider representation of groups in DE&I efforts and making a commitment to progress that considers the needs of all people, especially those who have been previously under-represented in business and in business metrics. Gathering and using inclusive metrics and reporting is a solution to realizing equity and social justice, a tool for activism and a mechanism for broader structural and behavioural change in business.

Through measuring and reporting DE&I inclusively, businesses are raising awareness of existing inequalities, making progress visible as well as galvanizing commitment and momentum to DE&I among employees and businesses. Inclusive metrics and reporting can also foster employee trust and satisfaction, strengthen business reputation and help businesses secure more resources for DE&I. The data generated through inclusive reporting can help businesses influence political, economic and social decisions that ultimately ensure equitable work environments as well as contribute to closing the implementation gap of realizing more equitable and socially just systems.

Pathways to Vision 2025

Providing underserved groups with access to jobs, skills and growth opportunities

Businesses and governments must take a systemic approach to providing equitable access as well as remove the college degree barrier and understand the structural barriers to equal job access. In addition, the following measures should be captured in new ESG frameworks.

Strategies for operationalizing this pathway include:

- **Support under-represented groups.** OneTen is a coalition of executives committed to upskilling, hiring and promoting 1 million Black Americans in the next 10 years. Another example is Year Up, which provides young people with skills, work experience and support in finding a job. Organizations and governments should prioritize measuring the effectiveness of these initiatives by tracking their impact on diverse people over time, such as success in securing and holding jobs.
- **Offer flexible work options.** Businesses should ensure these options do not inhibit future development opportunities, such as skills upgrading and career advancement. Insurer Zurich made flexible working the norm by offering all vacancies as part-time, full-time, job-sharing or flexible working. This change resulted in applications doubling, one-third more women securing senior roles and a rise in belonging among part-time employees.¹⁵¹
- **Address gaps in school-to-work transitions.** The focus should particularly be on economies with a high proportion of youth and rising

secondary education completion rates, especially for under-represented groups. More collaboration between governments, education institutions and businesses is needed. For example, the National Academy Foundation connects the business community to the education community to value learning other than at college and to develop on-the-job training.

- **Support workers through all phases of life.** Workers should be supported to remain in the labour market after key life transitions. For instance, EnterpriseAlumni helps large organizations maximize relationships with former employees as a vast, untapped pool of hires, referrals and advocacy as well as drive community and nurture the workforce. For the ageing population, reskilling, upskilling and lifelong learning programmes as well as supporting workforce re-entries are the way forward.
- **Connect with young people on the jobs of today and the future.** Globally, the examples of mentorship programmes in which seasoned professionals mentor young people towards success are many. Governments should support these programmes and companies should participate in them.

Amplifying the impact of business activism

Every business faces its own DE&I challenges and, therefore, must develop its own set of metrics and processes for measuring progress towards DE&I. In gathering and reporting on employee and corporate data, protecting individuals from the unintended or negative consequences of data disclosure

“ Every business faces its own diversity, equity and inclusion challenges and, therefore, must develop its own set of metrics and processes for measuring progress.





“ To realize inclusive metrics and reporting, businesses should move towards an integrated approach across all business functions to support corporate cultural change.

is critical. Furthermore, businesses must find new ways to work with government frameworks that hinder the ability of companies to measure workforce diversity. To realize inclusive metrics and reporting, businesses should move away from a siloed approach to DE&I consolidated under the human resources function and move towards an integrated approach across all business functions to support corporate cultural change. Governments can amplify the impact of business activism by setting standards for data analysis and disclosure as well as holding businesses accountable and disseminating effective examples.¹⁵²

Strategies for operationalizing this pathway include:¹⁵³

- **Identify and prioritize DE&I goals.** This includes identifying areas of risk, assigning accountability and continually assessing the extent to which specified DE&I goals have been achieved. Businesses should also ensure they are looking at intersectional categories, which are often overlooked.
- **Devise an intersectional and corporate-wide approach to DE&I metrics.** This corporate approach should continually review and respond to systemic inequities within

existing policies and procedures across all organizational functions. For example, DE&I metrics could be owned by the full executive committee to ensure collaboration organization-wide.

- **Align metrics and reporting structures.** This will standardize and benchmark DE&I efforts across businesses and global indexes. Sustainability and resource indexes need to ensure that the metrics cover all aspects of DE&I. Additionally, organizations should create a legal framework that lays out which diversities can be measured in different countries and how best to measure safely.
- **Encourage employee resource groups.** This encouragement includes mobilizing and advocating for their interests, metrics and inclusive policies, creating representation, incentives and further momentum. For example, organizations should co-create and maintain DE&I metrics in collaboration with employee resource groups.

Governments can amplify the impact of business activism by setting standards, holding businesses accountable and disseminating effective examples of business activism.

Human rights

Human rights must be given a permanent place in the boardroom to fully integrate them in the strategy, leadership and operations of a company.



Businesses must align their ESG work with international human rights norms and ensure that the voices and perspectives of affected stakeholders are brought to the attention of leadership.

Three major trends related to business and human rights include:

- **Growing inequality.** At the start of 2020, 70% of the world's population was facing ever increasing inequality, a trend further exacerbated by the COVID-19 pandemic.¹⁵⁴
- **Expectations from stakeholders.** Society expects powerful institutions to be increasingly accountable for their actions. Public trust in institutions has decreased significantly and young people around the world demand that all stakeholders deliver on the promise of a post-pandemic world that tackles inequality, injustice and climate change.
- **Legislation on business responsibility to respect human rights.** While progress in the last decade has been largely driven by voluntary action and a small number of corporate leaders, regulation will likely be an important factor in environmental and social sustainability in the next decade. Governments began to introduce new legislation aimed at addressing the corporate responsibility to respect human rights.

The corporate responsibility to respect human rights, as set out in the *UN Guiding Principles on Business and Human Rights* and related standards, is the foundation for business' role in preventing human rights harms and helping remedy those that occur. It is also the standard for responsible business conduct. Taking a human rights lens will help companies meet their responsibility to respect human rights, meet evolving societal expectations about business' role and be a force in tackling inequality.



Vision 2025

Tackling societal challenges

Outside of their own operations, by 2025 business proactively engage in wider societal discussions on how to reduce inequality and promote human rights.

- Businesses cannot remain neutral on issues relating to growing inequality within society and between generations; they must actively challenge discrimination or risk being perceived as silently complicit. The #MeToo, #BlackLivesMatter and other social movements have shown that gender, racial and other forms of inequality are deeply rooted everywhere, while climate justice demands an intergenerational approach to all sections of society.
- Flawed business practices, including insufficient attention to harmful labour practices in global supply chains, exacerbate inequalities, such as those resulting from inadequate wages, a lack of workplace representation or collective bargaining, or the exploitation of vulnerable groups, such as migrant workers.
- Businesses benefit from the rule of law and from a vibrant civil society. Efforts by governments to undermine strong legal accountability or to restrict civic freedoms will, in turn, have a negative impact on business.
- Societies expect businesses to be responsible societal and environmental actors. These ESG expectations are increasingly translating into new laws and industry standards – some focusing on mandatory human rights and environmental due diligence, others on mandatory disclosure or on the non-financial responsibilities of company boards. Most of these approaches require, or are enhanced by, engagement with affected stakeholders. Knowledge of the risks these groups and communities face, and the impact of companies on them, enable responsible companies to comply more fully with these laws and standards.
- Correspondingly, company boards must reflect the broader composition of society. Too many boards lack diversity and have little or no representation from affected stakeholders and their representatives. Companies cannot address social inequality effectively if they embody this same inequality in their senior management and board structures.

Building competence, experience and skills

As ESG expectations grow, boards of directors hold critical roles as stewards for the company and its interests. By 2025, boards must recognize the evolving expectations on companies with respect to human rights, and ensure their own membership has the right skills, knowledge and commitment to these issues.

- Boards need to be diverse in both their members' backgrounds and identities, as well as their experience. This requires an intersectional approach to board composition. Composition cannot be about identity or visual appearance alone but must also be about heterogeneous experience and mindsets.
- Training in ESG is an evolving requirement. Boards must also be sensitized to the true impact of their companies in societal and environmental terms.

“ Boards must recognize the evolving expectations on companies with respect to human rights, and ensure their own membership has the right skills, knowledge and commitment to these issues.

Engaging with affected stakeholders

Corporate responsibility to respect human rights is fundamentally about people. Protecting and empowering those most vulnerable to the impacts of corporate actions is key to meeting that responsibility. By 2025, engaging with affected stakeholders should not be a box-ticking exercise but rather a way of truly and directly gaining insights into the ways in which companies and their practices affect people and communities.

Pathways to Vision 2025

For human rights concerns to be fully integrated across the strategy, leadership and operations of a company, the topic must find a permanent place in the boardroom itself. To be able to do that, companies must engage with stakeholders, especially those most vulnerable to potential negative impacts.

The World Economic Forum Global Future Council on Human Rights challenges corporate boards to examine their existing capacity and commitments on human rights, providing tools and guidance for how they can prioritize stakeholder engagement on these issues as an exercise of their board duties. Through a series of private consultations with corporate non-executive directors, business leaders, corporate human rights experts, affected stakeholders and civil society representatives, in the coming year the Council will release guidance to boards on new and existing mechanisms for affected stakeholder engagement, understanding and signposting the experience and competencies that are essential for board members to act effectively on this knowledge.

Strategies for operationalizing this pathway include:

- **Conduct human rights due diligence.** Human rights are not simply the “S” in ESG. Respect for human rights must underpin all business action inside and outside of the company and cannot be reduced to a single indicator. Companies need to undertake comprehensive human rights due diligence to understand their

impact on people and be held accountable for those impacts.

- **Establish engagement mechanisms.** This includes creating clear and efficient mechanisms for a meaningful understanding of and engagement with affected stakeholders, in particular those rights holders most vulnerable to the negative effects of business actions.
- **Build competence.** This means ensuring that corporate boards have the expertise and competence to not only understand human rights impacts but also actively engage with internal functions in the company to address them. This may require the direct representation of affected stakeholders on the board or through the selection of board members with human rights expertise and/or responsibility. It could also take the form of proxy representation through, for example, worker councils.
- **Ensure performance tracking and reporting.** Respect for human rights must be linked to performance KPIs and clear incentives at all levels of the organization. Board members should review performance tracking and reporting on an ongoing basis as part of the overall performance of the company. Corporate actions should also be evaluated by independent assessors applying industry standards and metrics. The results of these assessments should be transparently shared.

“ Human rights are not simply the “S” in ESG. Companies need to undertake comprehensive human rights due diligence to understand their impact on people and be held accountable for those impacts.



Mental health

There has never been a more urgent moment to address long-standing issues in mental ill-health, or a better opportunity to build back better.



The profound disruptions to daily life brought about by COVID-19 have led to an unprecedented rise in rates of depression, anxiety, substance use and attempted suicide, particularly among young people. Additionally, mental health service infrastructure has been disrupted. These consequences will outlive the physical danger of COVID-19 and must be systematically addressed. While this crisis is deeply concerning, it has instigated a paradigm shift in regulatory structures and treatment. It has done much to put mental health on the map as an issue that needs addressing, creating opportunities for innovative, scalable solutions that transcend borders and economic sectors.¹⁵⁵

- **Widening inequality.** Rates of mental ill-health conditions have risen across all demographics, but those hit hardest are younger populations, those who were already subject to structural

disadvantages and those with pre-existing conditions.

- **Disruptive technologies.** Restrictions on physical movement and rising rates of mental health diagnosis are being countered by digital technologies that can operate remotely at scale.
- **Harmful stigma.** While much still needs to be done, advocacy, generational change and more frequent personal experiences of mental ill-health are breaking the stigma around discussing a topic that has long been taboo.

In the past year, forward-thinking policy-makers, advocates, psychiatrists, neuroscientists, psychologists, public health professionals, technologists and business leaders have shown that the global community can face great challenges with resilience and determination.



Vision 2025

Ensuring trust in digital technologies

Digital solutions are rapidly deployed to reach as many people as possible while demand for mental health services and global inequality are both increasing. Questions remain on how these solutions should be put into place, and what mechanisms must be enacted to ensure they are properly protecting privacy, live up to claims and are interoperable across systems and borders.

Improving measurements for better management

According to experts writing in the *Journal of Adolescent Health*, “Addressing adolescent mental health starts with good data on the prevalence of mental health conditions as well as risk and protective factors. These data are essential for informing the design and implementation of appropriate policies and programmes and allocation of resources to support adolescents. Yet, data on adolescent mental health remain sparse, especially in low- and middle-income economies (LMICs) where ... nearly 90% of the world’s 1.2 billion adolescents live. The challenges inherent to measuring mental health are exacerbated in LMICs, as lack of investment has led to lack of resources and standardized validated tools for measuring mental health in these settings.”¹⁵⁶

Data collection efforts focus on adolescent health risks (such as bullying, substance use, lack of physical activity), with scant data on adolescent mental health outcomes, and little information on key determinants, including norms. According to experts, “Efforts to develop validated adolescent measures of population mental health (including through UNICEF’s Mental Health Among Adolescents at the Population Level initiative)

enable the inclusion of high-quality measures in population or school-based surveys, enabling more nuanced understandings of outcomes, risks and determinants.”¹⁵⁷ Key efforts to validate these measures, including younger age groups (10 to 14 years) and employing innovative approaches and the use of digital technologies to improve data collection, are in place. These efforts contribute to closing the data gap related to child and adolescent mental health at the country level, ultimately extending benefits beyond a reduction in mental disorders, optimizing the capabilities and quality of life of this generation.

Crafting policies to bolster “mental wealth”

Mental health is no longer one of the most neglected areas of public health. This neglect was caused in part because, historically, a “deficit-based approach” was adopted, focusing on avoiding mental illness and relying on the health sector to manage problems and respond to acute events, despite a recognition of broader social and economic drivers. This approach did not fully conceptualize the human potential that could be unlocked by investing in mental assets, which in turn can lead to wealth creation for individuals, communities, and economies. As countries reconstruct in the post-COVID era, mental health is reconceptualized as a key contributor to the mental wealth of nations, encouraging an asset-based approach that pushes governments to focus on creating environments where people can flourish. The concept of “mental wealth” helps policy-makers understand and choose the right policy levers (across the economic, health and social sectors) that contribute to increasing the community connectedness, mental capital, mental health and well-being that underpin productive, creative, resilient and thriving communities and contribute to building national prosperity.

“ The concept of “mental wealth” helps policy-makers understand and choose the right policy levers that contribute to increasing community connectedness, mental capital, mental health and well-being.

Pathways to Vision 2025

“ Digital mental health regulations can ensure that innovators know what to build towards, and end users have trust that the product they are using is safe, ethical and efficacious.

Incentivizing the trusted, ethical adoption of digital solutions

Digital solutions hold great promise to take away some of the burden from over-stressed systems while simultaneously reaching those who do not have the resources or capability to interact with traditional mental health services or may feel stigmatized in face-to-face locations. If regulated properly, digital mental health regulations can ensure that innovators know what to build towards, procurement offices (whether they be governments, employers or insurance organizations) have a clear sense of what they are getting, and end users have trust that the product they are using is safe, ethical and efficacious.

Strategies for operationalizing this pathway include:

- **Pilot the toolkit for digital mental health.** In partnership with Deloitte, the World Economic Forum has developed the Global Governance Toolkit for Digital Mental Health to “provide governments, regulators and independent assurance bodies with the tools to develop, adopt and engage standards and policies that address major ethical concerns relating to the use of disruptive technology in mental health.”¹⁵⁸
- **Contribute to future iterations of the toolkit.** Innovators, business leaders, policy-makers and mental health experts are all needed to ensure that the framework remains dynamic and up-to-speed with the latest trends.

Rebuilding the mental wealth of nations

Despite unprecedented investment in strengthening economic, social and health systems that could foster mental wealth in the wake of the pandemic, several challenges remain, including uncertainty regarding what impact those investments are likely to have and how best to allocate limited

resources across the potential drivers of mental wealth. Addressing these challenges is the primary preoccupation of the University of Sydney's Mental Wealth Initiative, in partnership with the Global Future Council and the United Kingdom's SIPHER (Systems Science in Public Health and Health Economics Research) Consortium. The primary objectives of the Mental Wealth Initiative are to measure, monitor and forecast the mental wealth of nations and help identify those policy opportunities that will foster this broader measure of national prosperity.

Strategies for operationalizing this pathway include:

- **Define and quantify a measure of mental wealth.** The initiative is working to operationalize national and population-based measures of mental wealth that broaden the lens against which social and economic progress are assessed beyond that traditionally captured by GDP.
- **Apply a systems lens.** Measuring and forecasting mental wealth requires a systems modelling approach, capturing the interacting factors that influence mental capital, mental health and well-being that in turn contribute to productivity gains and losses not traditionally accounted for in other measures of national wealth. The initiative is applying complex systems modelling and simulation to forecast national trajectories of mental wealth and to understand the extent to which government policy-mediated changes in the economic, health and social environment could enhance it.
- **Move from research to action.** The initiative is working with government, business, mental health and social policy and community leaders. It provides the forums needed to facilitate the exchange of knowledge and ideas to harness collective efforts, networks and resources to develop mental wealth and to coordinate advocacy and action nationally and internationally.



New agenda for fragility and resilience

Greater impact can be achieved by putting the needs of affected communities at the centre of humanitarian and development assistance.

Fragile regions are faced with an increasingly complex mix of challenges characterized by protracted conflicts, disease, poverty, climate change and weak governance. The United Nations estimates that 274 million people will need humanitarian assistance and protection in 2022¹⁵⁹ at a cost of nearly \$41 billion dollars, or nearly double the needs before the COVID-19 pandemic,¹⁶⁰ in addition to development aid needs.¹⁶¹

Yet, trends indicate that many challenges risk not being addressed due to:

- **The changing nature of conflict.** The volume and length of humanitarian and development needs are increasing as conflicts become more protracted and globalized with more numerous and fragmented actors. This is further aggravated by the convergence of megatrends, such as climate change, urbanization, the COVID-19 pandemic, corruption, violence and poor governance, resulting in adverse effects on livelihoods and essential services, and undermining development and humanitarian

efforts. When states lack fundamental structures and economic systems have collapsed, broad multistakeholder responses, including for macroeconomic stabilization, are needed.

- **The paradoxical impacts of digitalization.** Digital access and tools have helped boost economic productivity and unlock access to services. Yet, despite the potential to meet many humanitarian and development needs through digitalization, many rural and low-income communities around the world lack reliable, affordable internet access, or the tools and skills to use it. On the other hand, there is a risk that these digital solutions, if designed and implemented without appropriate expertise, could harm those they are intended to protect. For example, the use of autonomous weapon systems and cyberattacks pose threats to humanitarian and development efforts¹⁶² as they can attack critical infrastructure, influence social and political environments, and affect response preparedness in humanitarian and development organizations.¹⁶³



“ Greater impact can be achieved by putting the needs of affected communities at the centre of humanitarian and development assistance.

- **The widening gap between needs and resources.** The World Bank estimates that an additional 20 million people live in extreme poverty in countries affected by fragility, conflict and violence.¹⁶⁴ Realizing the SDGs in the most fragile contexts requires mobilizing significant public- and private-sector investments. Current financing mechanisms remain insufficient, public finance is plateauing, and business cases for private-sector investments in fragile contexts are unclear or lacking due to an absence of compelling proof-of-concept projects, financial de-risking mechanisms, infrastructure and required supply chain/ecosystem actors in the market. Such gaps in resources lead to significant delays to provide timely humanitarian and development assistance.

Actors across sectors are missing critical opportunities to collaborate to meet the growing and evolving needs of fragile communities. Greater impact can be achieved by putting the needs of affected communities at the centre of the response, with space for all actors to contribute their different skills, expertise and resources. In many settings, especially those of deep fragility, this will occur through public- and private-sector collaboration at the local, national and international levels. It is critical that these efforts are supported by an enabling domestic legal, policy and operational framework for which states are primarily responsible.



Vision 2025

By 2025, all communities have the infrastructure to access basic services, and the delivery of services is commercially sustainable. To achieve this vision, better alignment and cooperation among public- and private-sector stakeholders at the local, national and international levels are needed to make significant progress building these infrastructures and creating the sustainable markets that put communities in crisis on the path to resilience. Emphasis should be placed on ensuring access to essential services, enabling a life of dignity and opportunity, supporting the development of thriving and resilient economies, and expanding digital access.

Designing user-centric solutions

By 2025:

- The needs of affected communities are placed at the centre of the response through an iterative design and implementation process, so that services and products are locally relevant and accessible, individuals have choice, and the quality-of-service delivery improves.

- Climate-sensitive essential infrastructures are established to shield local populations from intersecting shocks and vulnerabilities.

Building capacity for locally based action

By 2025:

- Local institutions partner with local private-sector organizations and international aid organizations to design, fund and implement solutions.
- Existing resources are maximized and long-term strategies to transition responsibilities for more sustainable and scalable operations are developed.
- Local capacities are reinforced to scale and speed response in crisis situations, and whenever possible, prioritized and routinely deployed to address issues within the community.

Unlocking public- and private-sector finance to achieve the SDGs and enable local markets

By 2025:

- Private-sector organizations provide food, health, education, water, sanitation, electricity and other essential services in fragile regions where these are lacking and where a business case could be made for this; humanitarian and development organizations, and local and international governments, fill that role in other cases.
- Local and international private-sector organizations partner with public-sector actors to increase humanitarian funding and financing, and to develop new market pathways that allow aid-reliant groups to earn an income.
- Government leaders enable markets as the foundation for a community's long-term resilience. A more vibrant local economy provides increased access to employment for populations in local contexts, allowing them to move from aid reliance to increased autonomy and independence.

Leveraging existing digital technology and building new capacity

By 2025:

- Local and international private- and public-sector organizations partner to identify opportunities to promote infrastructure as a public good.
- The scaling of existing solutions is prioritized, whenever possible, to build digital capacity and infrastructure in humanitarian organizations and local populations.
- Local non-governmental organizations partner with organizations focused on improving the digital experience to ensure designs are based on the needs of local populations and provide opportunities for aid-dependent populations to explore opportunities for economic independence.
- Adherence to best-in-class data security and privacy standards is achieved when handling the individual data of vulnerable populations.



Pathways to Vision 2025

To achieve this vision, multistakeholder action is required in four areas: developing user-centric responses and solutions to crises; reducing the gap between needs and resources, in particular by leveraging and strengthening local capacities; deploying public- and private-sector finance to support SDGs, in particular by developing entry points for private-sector investments in fragile contexts; and leveraging and scaling digital solutions in fragile contexts.

The World Economic Forum Global Future Council on the New Agenda for Fragility and Resilience developed a set of “Guidelines for complementary action in fragile contexts”¹⁶⁵ in line with these four pathways. The goal of the guidelines is to build more resilient communities through public-private partnerships that are focused on the risks, needs and aspirations of local communities and on enhanced complementarity of local, national and international as well as private- and public-sector actors, and that are facilitated by digital solutions.

Developing user-centric responses and solutions to crises

- **Support existing multistakeholder action.** The Grand Bargain is “a unique agreement between some of the largest donors and humanitarian organisations who have committed to get more means into the hands of people in need and to improve the effectiveness and efficiency of the humanitarian action”.¹⁶⁶ Its workstreams 1 (Greater Transparency)¹⁶⁷ and 6 (Participation Revolution)¹⁶⁸ are particularly relevant. Other key foci of action include the Charter for Change, USAID’s User-Centric Design Approach, Principles for Digital Development (Design with the User), Core Humanitarian Standard on Quality and Accountability and World Resources Institute’s Principles for Locally Led Adaptation.



Reducing the gap between needs and resources

- **Strengthen collective action.** The Grand Bargain workstream 2 seeks to provide more support and funding tools for local and national responders,¹⁶⁹ and the Joint Intersectoral Analysis Framework provides further ideas for reflection.
- **Support existing partnerships and initiatives.** Partnering should be considered, for example with networks like ICVA, NEAR and START Network, as should support for initiatives, such as the UN Connecting Business initiative or the Somalia Nexus platform.

Deploying public- and private-sector finance

- **Join existing initiatives.** Initiatives to consider joining include the World Economic Forum Humanitarian and Resilience Investing Initiative, the World Bank’s PS4R (Private Sector for Refugees), Refugee Investment Network, Crisis Lookout coalition or the Anticipation Hub.

Leveraging and scaling of digital solutions in fragile contexts

- **Follow best practices.** Additional information can be accessed at Principles for Digital Development.¹⁷⁰
- **Join partnerships.** Organizations to consider for partnerships include the Digital Public Goods Alliance or GovStack.



3.6

Social cohesion and just transition

A just transition to sustainability is a necessary condition for ambitious climate action and to shape an equitable and climate-proof recovery.

“A “just transition” focuses on deliberate, choreographed efforts to ensure environmental sustainability with more and better jobs, social inclusion and poverty eradication.

While the effects of climate and environmental challenges undermine jobs, disrupt businesses and threaten communities, the transition to net zero also involves deep restructuring of economies and labour markets with far-reaching social implications. The concept of a “just transition”, which originated from North American unions in the 1990s as a framework to support workers likely to lose their jobs due to environmental protection policies, has since evolved to focus on deliberate, choreographed efforts to ensure environmental sustainability with more and better jobs, social inclusion and poverty eradication.

- **Ensuring net zero for all.** The net-zero shift may bring quality jobs and social inclusion, but it will not happen by default. Unplanned and unmanaged, the transition may exacerbate inequalities between and within countries and leave workers, communities and businesses stranded.
- **Expanding sustainable investment and green finance.** The volume of financial flows allegedly aligned to environmental and social

objectives is witnessing rapid increases, with demand often outpacing supply, but also creating challenges related to transparency, accountability and ratings. A just transition offers a framework to better articulate, address and manage social risks and the potential social impacts of the restructuring and contraction of emission-intensive industries.

- **Increasing attention and a proliferation of initiatives and instruments.** The United Nations just-transition framework is gaining prominence in national and international policy as policy-makers address the links between employment and social impacts of climate action to deliver fair and inclusive change. An understanding of the concept varies, risking weakening the value of a just transition as a policy tool and way to achieve social consensus.

It is critical to strengthen shared commitments and identify measures to align financial flows to social and environmental objectives in an integrated manner through a common just-transition framework.

Vision 2025

A just transition to sustainability has gained prominence as a necessary condition for ambitious climate action and as a framework to shape an equitable and climate-proof recovery. Adopting a just transition framework in public policies, business strategies and investments enables recognition of the employment and social implications of climate action to maximize positive impacts while minimizing and addressing negative ones and ensuring decent work. Strong consensus enables bold and inclusive change. Social dialogue is a crucial basis for a just transition, which also relies on meaningful stakeholder engagement processes with communities and Indigenous peoples.

Building a common understanding of a just transition

With the growing interest in a just transition and an increasing number of initiatives being developed, the concept is rendered as an internationally negotiated and recognized framework in the UN, under the International Labour Organization's (ILO) 2015 Guidelines for a Just Transition. The Guidelines provide a whole economy approach to ensuring decent work, sustainability and social inclusion, and focus on collaborative processes (termed "social dialogue") with governments, companies, investors, workers and civil society.¹⁷¹

Supporting financial flows to a just transition

By 2025, public- and private-sector financial flows align to just-transition goals to ensure commitments translate into investments and tangible changes. A just transition offers financial institutions and stakeholders a framework to better articulate and address social risks and opportunities in green finance and related portfolios and to assess and manage the potential social impacts of the restructuring and contraction of emission-intensive industries. It is vital to leverage

this momentum to provide robust and achievable entry points for financial-sector actors to align their decisions and strategies to a just transition.

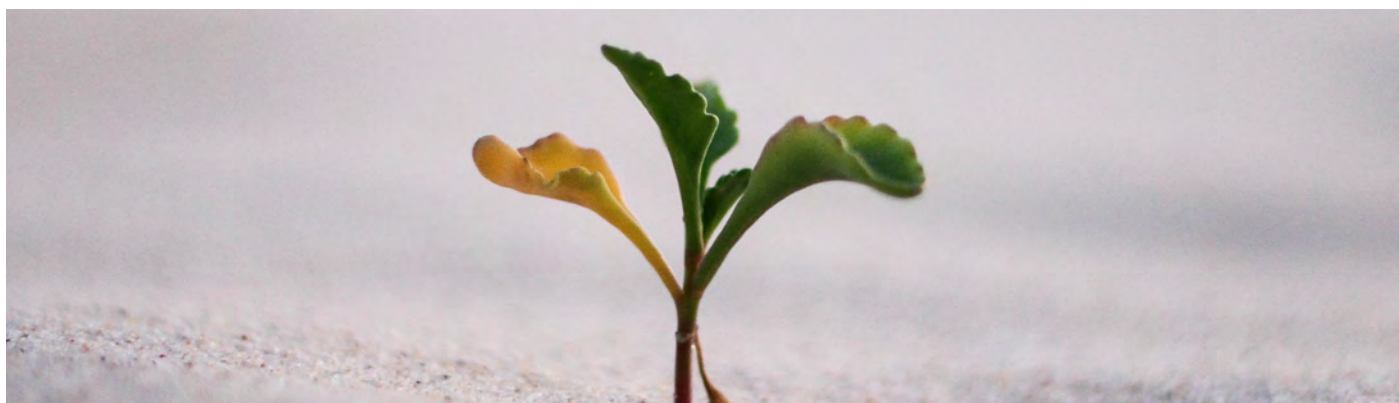
Illustrating applications of just-transition financing logic

To devise practical recommendations on what financing for a just transition may mean and require in practice, sectoral and topical perspectives are key. Such sectoral and topical perspective focuses on sectors with high relevance to environmental sustainability, particularly action on climate change and biodiversity, the decent work agenda, poverty eradication and rights.

In the context of the energy transition, the mining sector is taken as the initial sector of focus, which may generate lessons applicable to developing analyses of other sectors. Mining in connection to a just transition is typically tackled in relation to coal mine closures and impacts on workers and communities, but broader dynamics are at play that also deserve attention. Clean energy minerals are critically important for ambitious climate action as mining has tight connections to deforestation, ocean health and biodiversity loss. Such environmental challenges need to be tackled if the transition is to deliver sustainability and avoid creating unmanaged trade-offs.

For a just transition in mining to be true to sustainability goals and future-proof, it must also consider and plan for shifts towards greater circularity. The value chain of clean energy minerals is closely connected to the decent work agenda, poverty eradication and the rights of Indigenous peoples. Delivering a just transition requires ensuring jobs along the value chain are decent, the rights and well-being of Indigenous people and communities are respected, and mining revenues can foster local economic and social development. Articulating these considerations and drawing recommendations with a just-transition financing perspective can clarify opportunities, risks and strategies.

“ Adopting a just transition framework in public policies, business strategies and investments enables recognition of the employment and social implications of climate action.



Pathways to Vision 2025

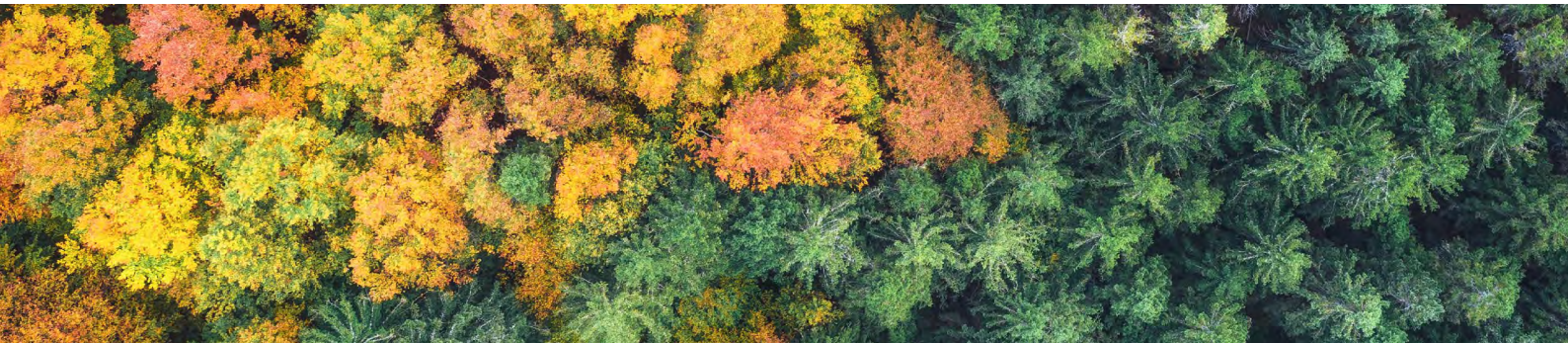
Enhancing understanding and increasing support for a just transition

Considering the emergence of many initiatives, commitments and messages on the just transition, enhancing the awareness of the transition is needed, translating the existing concept (and its internationally recognized and negotiated references) into strategies, actions and examples for key change agents.

To promote a greater understanding of a just transition and its implications for stakeholders, the World Economic Forum Global Future Council on Social Cohesion and Just Transition seeks to develop models to apply financing mechanisms in line with the just transition and highlight emerging areas for translating the transition with workers and communities into strategies and actions.

Strategies for operationalizing this pathway:

- **Produce and disseminate knowledge and communication products.** This includes providing further information to stakeholders on their roles in driving a just transition and showcasing existing examples where the transition has been successful.
- **Foster greater knowledge sharing from existing national social dialogue processes on a just transition.** Unions and workers' associations are essential for worker participation in transition. According to the ILO's working definition, social dialogue "can exist as a tripartite process, with the government as an official party to the dialogue or it may consist of bipartite relations only between labour and management (or trade unions and employers' organizations), with or without indirect government involvement", and involves formal processes of negotiation, consultation and information exchange and covers both economic and social policies and agreements.¹⁷²
- **Facilitate peer learning, knowledge transfers and best practice sharing.** Examples include organizing seminars and workshops with practitioners to present and discuss just-transition actions.
- **Encourage opportunities for multistakeholder collaboration on successful just-transition processes and results.** Multistakeholder collaboration is needed to socialize the existing ILO guidelines and further ensure their application across stakeholders, sectors and country contexts.



Aligning financial flows to a just transition

Given the growing interest of investors and other financial institutions in a just transition, there is need to build on and contribute to the emerging body of research on how to structure just-transition financing and draw recommendations that can serve as a basis for action.

Strategies for operationalizing this pathway include:

- **Define the state-of-play and map the just transition finance ecosystem.** Relevant frameworks and initiatives can be drawn upon, and gaps may be addressed.
- **Build use cases.** Practical recommendations can be drawn upon based on the just energy transition and mining cases, tackling multidimensional challenges and opportunities around decent work, local communities and environmental management.
- **Develop recommendations on just-transition financing.** It is necessary to understand existing cases where a just transition has been successful, how it was financed, and which best practices can be applied across contexts.
- **Harness public-private cooperation and partnerships.** One example is holding roundtables to discuss recommendations and encourage action.



3.7

Work, wages and job creation

Reskilling is critical for many career transitions, and around half of all employees will need reskilling between 2020 and 2025.

“Quality jobs, with decent wages and working conditions, are needed. Addressing the disruption to jobs, wages and work requires a cross-sectoral, multistakeholder effort.”

The triple disruption of the COVID-19 pandemic, accelerated automation and climate change is accelerating the following trends and leading to rising social discontent:

- **Job disruption.** ILO estimates project 52 million fewer jobs worldwide in 2022 than in the fourth quarter of 2019.¹⁷³ The urgent need is to encourage job creation, especially for youth, women and vulnerable groups, and to support the transitions of workers from at-risk roles.
- **Transition to the future of work.** Job quality has come into greater focus and the challenges of new ways of working for well-being have become apparent. As organizations respond to the current disruptions and to changing worker preferences,

an opportunity exists to transform how work is conceptualized, organized and performed.

- **Increased inequality.** Wages have faced further downward pressure and the differentiated impact of the triple disruption on disadvantaged groups has reinforced challenges of declining social mobility.

Quality jobs, with decent wages and working conditions, are needed. Addressing the disruption to jobs, wages and work requires a cross-sectoral, multistakeholder effort. Collaborative, large-scale action can ensure economic dynamism and build a vibrant and sustainable ecosystem with an employable and productive workforce in good-quality jobs paying decent wages.¹⁷⁴

Vision 2025

Investing in new economy sectors and emerging roles

Job destruction paired with widespread rejection of poor-quality jobs has created a need for more and better jobs. New economy sectors with promising job creation potential include the care and sustainable economies, infrastructure and sustainable agriculture. Investing in the care economy not only directly creates jobs but also removes barriers to women working. In the sustainable economy, jobs that help preserve or restore the environment (whether in traditional sectors such as manufacturing or in emerging green sectors) modify production and lower energy use to achieve the objectives of the Paris Agreement of limiting global temperature rise to below 2° C, and could create 18 million jobs globally.¹⁷⁵ Infrastructure investment offers both short-term direct job creation and longer-term indirect job creation.¹⁷⁶

Supporting workers through job and career transitions

Longer working lives will entail more job transitions. In addition, the triple disruption will force many workers to pivot into a new career path. The World Economic Forum estimates that 12 million more jobs will be created than displaced by 2025 due to AI,¹⁷⁷ and public-private partnerships can help workers transition into these new jobs. Within companies, transitions can be smoothed by internal training and mentoring. However, many transitions take place across companies and the support for such moves is limited.¹⁷⁸

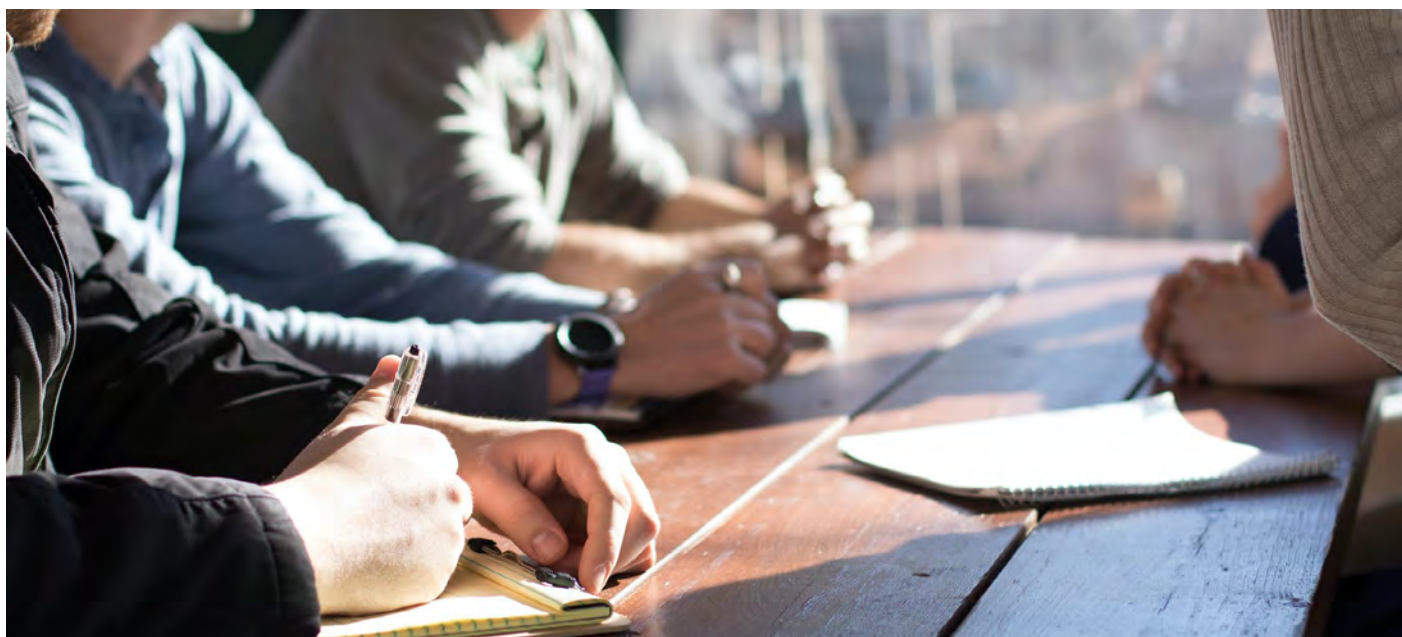
Reskilling is critical for many transitions; indeed, around half of all employees will need reskilling between 2020 and 2025.¹⁷⁹ But reskilling is better established for high-skilled jobs than for the much larger number of lower-skilled jobs – the most susceptible to automation. The massive expansion of online learning during the pandemic offers a potential solution.¹⁸⁰ Also required is better assistance for workers to understand potential job transition pathways and the skills they will need to develop for new roles. Moreover, career transitions take time and often require extended support.

Providing minimum and living wages

The pandemic has called attention to the ways in which undervalued and underpaid work puts pressure on societies and economies and weakens resilience to shocks. Although 90% of the 187 ILO member states have a minimum wage,¹⁸¹ according to the World Bank, wage regulations are often bypassed and “in most developing countries, between a quarter and a half of wage-earners receive less than the statutory minimum wage”.¹⁸² Research shows that concerns among economists that such policies would have adverse effects on employment have not been realized.¹⁸³

It is important to set a base for wages that enables people to live with dignity and provide for a family, including education and healthcare. Universal basic income has been much discussed considering the risk to employment from automation, but evidence of its effectiveness is less established than for minimum/living wages, and it poses greater funding challenges.¹⁸⁴

“ 12 million more jobs will be created than displaced by 2025 due to AI. Public-private partnerships can help workers transition into these new jobs.”



Pathways to Vision 2025

Investing in new economy sectors and emerging roles

A multistakeholder approach is essential to investing in new economy sectors and emerging roles. Businesses and governments should work together to understand the relationships and dependencies between industries, and how strategies for job creation map across this ecosystem of relationships.

Strategies for operationalizing this pathway include:

- **Adapt to new employment models.** Traditionally, companies have either hired people as full-time equivalents or defaulted to using variable staffing, contractors and freelancers. However, the inflexibility of traditional employment models can discourage job creation and prompt workers to leave the labour market, and short-term solutions can come at the cost of security, stability

and worker welfare. New employment models, such as job-sharing, have the potential to provide flexibility and security.

- **Support public-private partnerships for job creation.** Addressing the employment gap and ensuring that the jobs created are good jobs require sustained collaboration among all levels of government, employers, workers, labour unions, education and training providers, workforce technology companies, employment agencies and foundations. Business leaders and investors must pay closer attention to the longer-term dividends of investing in the workforce.¹⁸⁵
- **Scale up net-zero employment policies.** Companies can commit to reskilling people in at-risk jobs into new roles within or beyond the company. Governments need to ensure that public investments crowd in rather than crowd out private investments and should collaborate with business to scale up net-zero employment policies to the sector level.¹⁸⁶

“New employment models, such as job-sharing, have the potential to provide flexibility and security.”



Supporting workers through job and career transitions

Supporting workers through job transitions requires a strong focus on reskilling and fostering a culture that recognizes the social and economic value of investing in workers. While many governments and businesses are helping employees prepare for the future of work, more should be done to build flexibility and adaptability into the culture and processes of the formal workforce.

Strategies for operationalizing this pathway include:

- **Develop public- and private-sector programmes for reskilling.** Leading companies

have experimented with a range of approaches to reskilling but most firms are not doing enough. There is scope for streamlining and standardizing approaches to allow for scaling, for instance new types of certification such as micro-credentials. Governments can provide incentives for reskilling by funding training programmes and investing in online learning; only 21% of businesses report being able to use public funds to help employees' upskilling and reskilling.¹⁸⁷

- **Consider AI-supported redeployment.** Effective job-switching strategies require the dynamic mapping of opportunities available to workers based on their skills. Advanced data and AI capabilities matched with user-friendly

“ Advanced data and AI capabilities matched with user-friendly interfaces have an important role to play in job matching and assessing career transition options.

interfaces have an important role to play in job matching and assessing career transition options. Companies can create alliances both within and beyond sectors to provide transition pathways. Support for people undertaking transitions can come from publicly provided safety nets and from the private sector rethinking outplacement to provide more extended support.

- **Embrace diversity and re-evaluate barriers to entry.** Facilitating smooth career transitions across sectors means widening the pool of candidates considered for traditional roles. Businesses can do this by re-evaluating rigid barriers to entry, addressing biases in the hiring process and introducing mentorship programmes for knowledge exchange.

Providing minimum and living wages

The ILO has robust definitions of minimum wages,¹⁸⁸ and the Global Living Wage Coalition estimates realistic living wage levels. These

data need to be translated into policies and methodologies backed by realistic commitments.

Strategies for operationalizing this pathway include:

- **Implement effective minimum and living wage policies.** Where effective minimum wage thresholds already exist, the case in many developed economies, the aim should be to ensure living wages. In non-OECD economies, the focus should be on implementing minimum wages as a first step.¹⁸⁹
- **Commit to living wages.** Businesses can commit to paying fair living wages to their own employees and ensuring their suppliers do the same.
- **Define and share methodology for ensuring living wages.** While many businesses agree that a living wage is a good thing, fewer have a coherent idea on how to make it a reality. A multistakeholder-driven methodology and framework is needed to pave the path for change, drawing on strong case studies and robust labour data.





④ Technology

Advanced manufacturing and value chains

Manufacturing is positioned to address global megatrends and to serve as a role model for a triple-bottom-line mindset.

Representing more than 20% of the planet's carbon footprint¹⁹⁰ and contributing to approximately 16% of global gross domestic product (GDP),¹⁹¹ manufacturing companies are positioned to drive responsible growth while addressing the complex challenges raised by consumers, climate change and digital transformation.

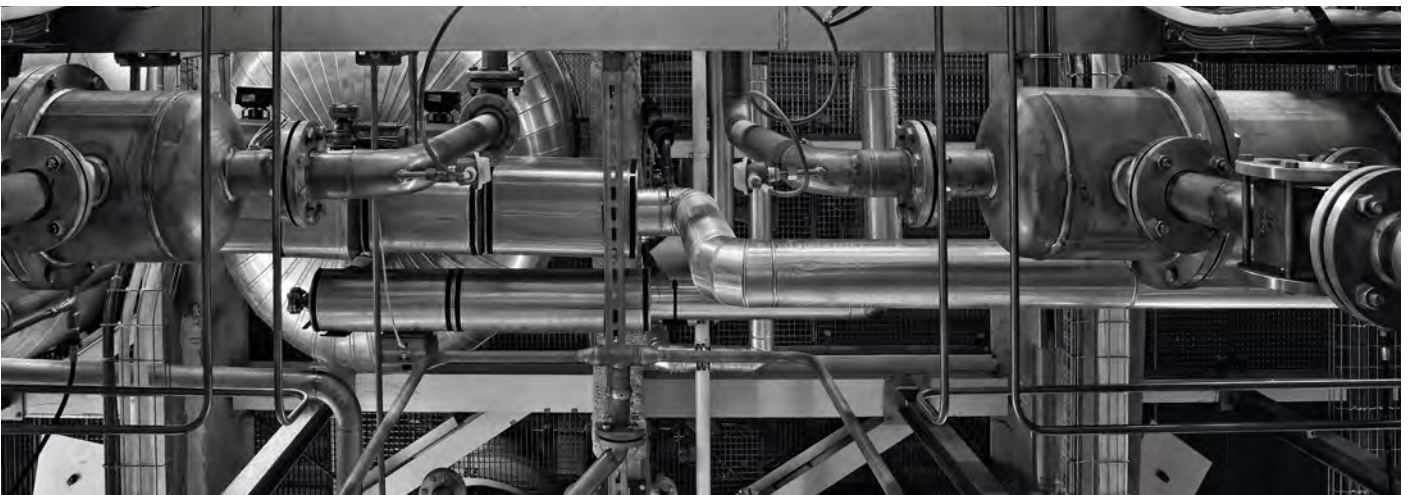
The challenges include:

- **New consumer behaviours.** The COVID-19 pandemic has deeply changed how consumers select and buy products, and how they expect to be engaged by companies. Consumers seek frictionless purchases, full transparency of product information, and personalized products, which require new levels of performance and agility from manufacturing and supply chains.
- **Climate change and the imperative of a net-zero-emissions world.** Current challenges have elevated the importance of manufacturing companies in cutting CO₂ emissions and creating circular business models.
- **Digital transformation and disruption.** To remain competitive in markets transforming with

digital players and new entrants, manufacturing companies must go beyond digitalizing operations and leveraging investments in advanced manufacturing to transform their operating and business models.

- **The future of work.** Work is shifting to become more agile and flexible: the type of jobs and skills needed are changing, while employees are rethinking their work expectations regarding volume, location, opportunities for advancement and work-life balance. Companies can leverage these two developments by focusing on workforce empowerment and retraining – satisfying changing expectations of employees while developing the necessary skill set for the future.

In addition, the risk profile associated with manufacturing and value chains has increased significantly during the COVID-19 pandemic, with global events and growing challenges – such as the temporary blockage of the Suez Canal in 2021 or continuously increasing cybersecurity threats – become more prevalent, complex and pressing. Manufacturing companies must be empowered to embrace advanced manufacturing towards more responsible and resilient growth.



Vision 2025

Manufacturing is positioned to address global megatrends and to model a triple-bottom-line mindset that benefits not only profits, but also people and the planet. This vision can be summarized under three strategic pillars:

Unlocking innovation in products, technologies and business models

Companies unlock and deploy innovative products, technologies and business models to create new value and transform production industries with a positive impact on society.

Moving to sustainable value creation

Sustainability in production is not just a vision and an explicit goal but also an enabler that can help

achieve other targets. During challenges, such as hiring employees and rising energy and regulatory costs, striving for more responsible production benefits not only shareholders, but also the whole ecosystem in which a company is integrated. Moving towards circular value chains and net-negative carbon manufacturing is imperative for a company to become more inclusive and sustainable. Companies drive sustainable and profitable growth, set plans to achieve carbon neutrality and commit to ESG reporting throughout manufacturing and production value chains.

Driving inclusive value creation

Measures are taken to provide every manufacturing worker with new opportunities and to support companies of all sizes, regional governments and local communities in strengthening companies' competitiveness.

“ Moving towards circular value chains and net-negative carbon manufacturing is imperative for a company to become more inclusive and sustainable.



Pathways to Vision 2025

Creating value for all stakeholders

Innovative business models must ensure that value and growth are created for all stakeholders of a company, such as shareholders and employees and their local business ecosystem, including customers, suppliers and government agencies, among others. Leveraging innovation and technology adoption are important to driving this transformation.

Strategies for operationalizing this pathway include:

- **Provide clarity.** Clear values must be established for all stakeholders when launching new initiatives or adopting new technologies.
- **Learn about the different stages of business model transformation.** Strategies for each stage exist and the board should ask key questions to ensure a smooth transition towards more digitalized business models.¹⁹²



- **Join the cross-company accelerator.** This accelerator, launched by the World Economic Forum New Business Models enabled by Advanced Manufacturing initiative, aims to deliver interactions where organizations share their own business model transformation journey.¹⁹³

Building resilient value chains

Resilience must become a core part of supply chain strategies. Most legacy manufacturing and value chains have undertaken significant upgrades to cope with unprecedented consumer needs and demand volatility, increasingly complex regulations and heightened expectations on tracking the impact of sustainability. This has in turn increased their reliance on complex digital systems – which can themselves face significant reliability issues and cybersecurity threats.

Strategies for operationalizing this pathway include:

- **Explore distinct resilience profiles and identify best practices.** The World Economic Forum White Paper, “Charting the Course for Global Value Chain Resilience”, presents five distinct profiles of resilience leadership to help companies in the manufacturing and supply chain ecosystem confidently chart a course towards resilience with focus and action and to manage supply chain disruptions.¹⁹⁴
- **Assess the value chain resilience level.** Organizations can use the resiliency compass, a new framework for them to accelerate the resilience-building process and define the new priorities and actions needed to prepare for and respond to future disruption.¹⁹⁵
- **Consider resilience impacts when implementing new systems.** The resilience of value chains must be considered a key metric when making investment decisions, keeping both its positive and negative effects in mind.

“ Organizations can use the resiliency compass, a new framework for them to accelerate the resilience-building process and define the new priorities and actions.

Leveraging technology adoption

Companies cannot solely focus on technology implementation; importantly, they must also concentrate on its comprehensive adoption by their organization at all levels and in all functions and geographies. This requires significant adjustments to the work culture, organization and work processes while considering local circumstances. Defining clear standards for excellence helps bring clarity and focus to the criteria for successful adoption, and sharing successful implementations and lessons learned can empower entire ecosystems to progress further.

Strategies for operationalizing this pathway include:

- **Become a global lighthouse.** Companies can submit a production site to be assessed and designated as a “Global Lighthouse” to showcase and share the experience.¹⁹⁶
- **Assess the readiness for introducing new technologies.** Companies can also use and adopt the Smart Industry Readiness Index.¹⁹⁷

Working towards human-centric production

As the level of advanced manufacturing on the shop floor increases, a broader range of skills – some of which are entirely new – becomes paramount to the success of manufacturing businesses. It is thus important that companies identify and develop the right skill set today to ensure success in the future.

Strategies for operationalizing this pathway include:

- **Develop the right skill set.** The workforce must be enabled to participate in the modern manufacturing environment and interact with digitalized systems, enhancing their strengths and addressing their challenges for a more inclusive environment. Both retraining and increasing technical skills are important building blocks to achieve this.

“ Ensuring that data are captured, processed and activated in an accurate and timely way is paramount to maintaining trust in the digital ecosystem.

- **Nurture future leaders.** Manufacturing businesses should focus on nurturing future leaders with the right mindset to address global challenges.
- **Join the New Generation Industry Leaders group.** This Forum community comprises rising industry leaders working to design and drive a responsible industry transformation.¹⁹⁸
- **Champion workforce augmentation.** Companies can appoint an executive with responsibilities at the intersection of people, operations and technology deployment to champion workforce augmentation initiatives within the organization.¹⁹⁹
- **Share use cases and success stories.** Manufacturing businesses could share successful cases of workforce augmentation in the production ecosystem with industry pioneers, thought leaders, policy-makers and labour unions.

Developing sustainable manufacturing systems

Strategies for operationalizing this pathway include:

- **Adapt the business strategy.** The core of the business strategy should incorporate sustainability, circularity and net-negative carbon impact. This should be communicated throughout the organization.

- **Internalize sustainability in the organization.** An executive should be appointed for sharing best practices and engaging in cross-company dialogue about successful sustainability initiatives and implementation.

Unlocking data and value of data sharing

Data are one of the most valuable digital assets that serve businesses, consumers and employees. Ensuring that data are captured, processed and activated in an accurate and timely way is paramount to maintaining trust in the digital ecosystem. Sophisticated applications often require the exchange of data beyond company boundaries to effectively train AI algorithms and to support collaboration in complex networks that require full transparency.²⁰⁰ It is also imperative to ensure a responsible use of data and to be aware of potential biases when training algorithms and AI.

Strategies for operationalizing this pathway include:

- **Apply the Manufacturing Data Excellence framework.** The framework can help gain actionable insights on the data maturity of the organization.²⁰¹
- **Join a community of senior executives.** Such a community provides the opportunity to discuss the change journey of becoming a data-driven organization.²⁰²



Agile governance

Agile governance helps ensure that emerging technologies can be harnessed for social progress, while supporting responsible and equitable transitions to the digital future.



Traditional institutions and regulatory processes have lagged in adapting and responding to the technological advances that drive economic and social changes. Agile governance approaches seek to reform regulation and bridge divides by generating new approaches to policy-making that can unleash innovation while creating effective regulatory frameworks and better governance outcomes.

To support innovative ecosystems, agile governance will increasingly be influenced by these trends:

- **Disruptive technologies.** As a driver of agility and an enabler of dynamic regulatory systems, technological disruption will continue to spur adaptive policy systems that can keep pace with digital advances.
- **Complex public-private relationships.** The real and digital worlds are increasingly

connected. As social media, banks, healthcare, education and other fields integrate online, the relationships between businesses, governments and citizens will become more complex.

- **Proactive business risk management.** Business and government must account for more risks alongside growing social and environmental challenges. Mechanisms of traditional governance have been slow to respond, resulting in businesses voluntarily adopting social responsibility measures, such as reporting on ESG metrics.

Such trends require agility to keep pace with the velocity of change in intricate systems, and governance frameworks to ensure governments maintain control over regulatory and policy systems. Combined, agile governance helps ensure that emerging technologies can be harnessed for social progress while supporting responsible and equitable transitions into the digital future.



Vision 2025

Agile governance represents a fundamental shift in policy-making. To enable this shift, three actions for change are needed:

Harmonizing boundaries between the public and private sectors

Governance can no longer be a one-way channel from government to business. A more transparent and collaborative process can steer innovation, safeguard markets and protect consumers, all without unduly curtailing advancement or burdening the private sector. Harmonizing boundaries will require:

Governments to:

- Put consumers and businesses at the centre of the process of policy development
- Work across departments and authorities to coordinate supervision of the private sector
- Innovate their policy-making process

Businesses to:

- Engage policy-makers and other industry stakeholders proactively
- Be open about their needs and objectives to help governments stay on top of the landscape
- Invest in education and capacity building to make new technologies more accessible

Redefining public-private relationships is essential. Without removing boundaries, implementing collaborative risk-sharing models can help avoid conflicts of interest while harmonizing exchange between government and business.

Developing the tools and technology

Agile governance strives to improve the regulation and governance of technology. It involves the development of governance frameworks, policies

and regulations that better manage emerging technologies and are resilient to further technological disruption. Many of the existing agile governance tools are only just starting to mature after being tested, refined and redeployed using identified best practices.

Agile governance has evolved with the parallel imperative of using technology to deliver optimal regulatory and governance outcomes. The systematization of technologies can unlock regulatory potential. An expanding field of deploying regulatory technologies, known as “regtech”, leverages emerging technologies such as artificial intelligence (AI) and blockchain to improve the efficiency and effectiveness of regulatory processes. However, as businesses increasingly take ownership of their social and economic responsibilities through proactive risk management, it is also important to consider how technology will support agile-based structures like self-regulation or industry self-governance.

Building demand and capacity

Agile methods can help government and business overcome structural disadvantages that impede fast-paced decision-making and adoption. For government, challenges include complex bureaucratic processes and departmental silos. For business, complex legislation, high monitoring and reporting costs, and regulatory uncertainty are significant hurdles.

Greater awareness is about how agile techniques provide value. Examples include sandboxes, machine-coded regulation and performance-based regulation – from facilitating the birth of new industries and delivering social services to managing environmental activities. Furthermore, capacity building is vital to create broader understandings of agile principles, such as human-centred design and experimentation, and to enhance personal abilities to create more agile leaders. It empowers policy-makers with the right knowledge and tools to facilitate their governance of technology and their use of technology to govern. It also empowers businesses to iteratively improve and adapt their innovations to meet market demands and deploy technologies responsibly.

“ Agile governance involves the development of governance frameworks, policies and regulations that better manage emerging technologies and are resilient to further technological disruption.

Pathways to Vision 2025

Establishing scale

For agile governance to scale beyond specific use cases, pilots and champions, an environment must exist where businesses and policy-makers can embrace collaboration, experimentation and user-centred design.

Strategies for putting this pathway to use include:

- **Foster agile leadership.** Leaders can encourage others to embrace new methods of policy-making by sharing the achievements of agile governance. The Agile 50 list, an initiative by Apolitical and the World Economic Forum Global Future Council on Agile Governance, shares the contributions of such leaders.²⁰³
- **Establish designated innovation fields.** Fostering experimentation is important to shifting from a “set-and-forget” to a “test-and-

learn” mindset. Programmes such as the Dubai Programme to Enable Drone Transportation, and designated physical experimentation fields, help foster innovation beyond in a safe space.

- **Share agile governance techniques and best practice.** As an evolving area, it is important to invest in understanding how best to employ and deploy agile governance. The Global Future Council on Agile Governance is developing a set of modules to help business leaders and policy-makers feel confident in using agile governance.
- **Evolve from sandbox to scalebox.** While small-scale experimentation (e.g. sandboxes) has proven fruitful for policy development, it tends to involve a small number of market actors. The next stage is to establish “scaleboxes” – as recommended by the Kalifa Review of U.K. Fintech – where experimentation can occur in the market with consumers and focus on growth.²⁰⁴



Integrating partnership models

Multistakeholder collaboration is at the core of agile governance. It is critical to engage all relevant stakeholders – from developers and users to regulators – to foster knowledge exchange for the most optimal outcomes. These partnerships are tools for deploying agile governance.

Strategies for operationalizing this pathway include:

- **Joined-up regulation.** Emerging technologies can be managed using a “whole-of-government” approach that promotes coordination across regulators to streamline processes and drive consistency, especially for industries that may report to several authorities.

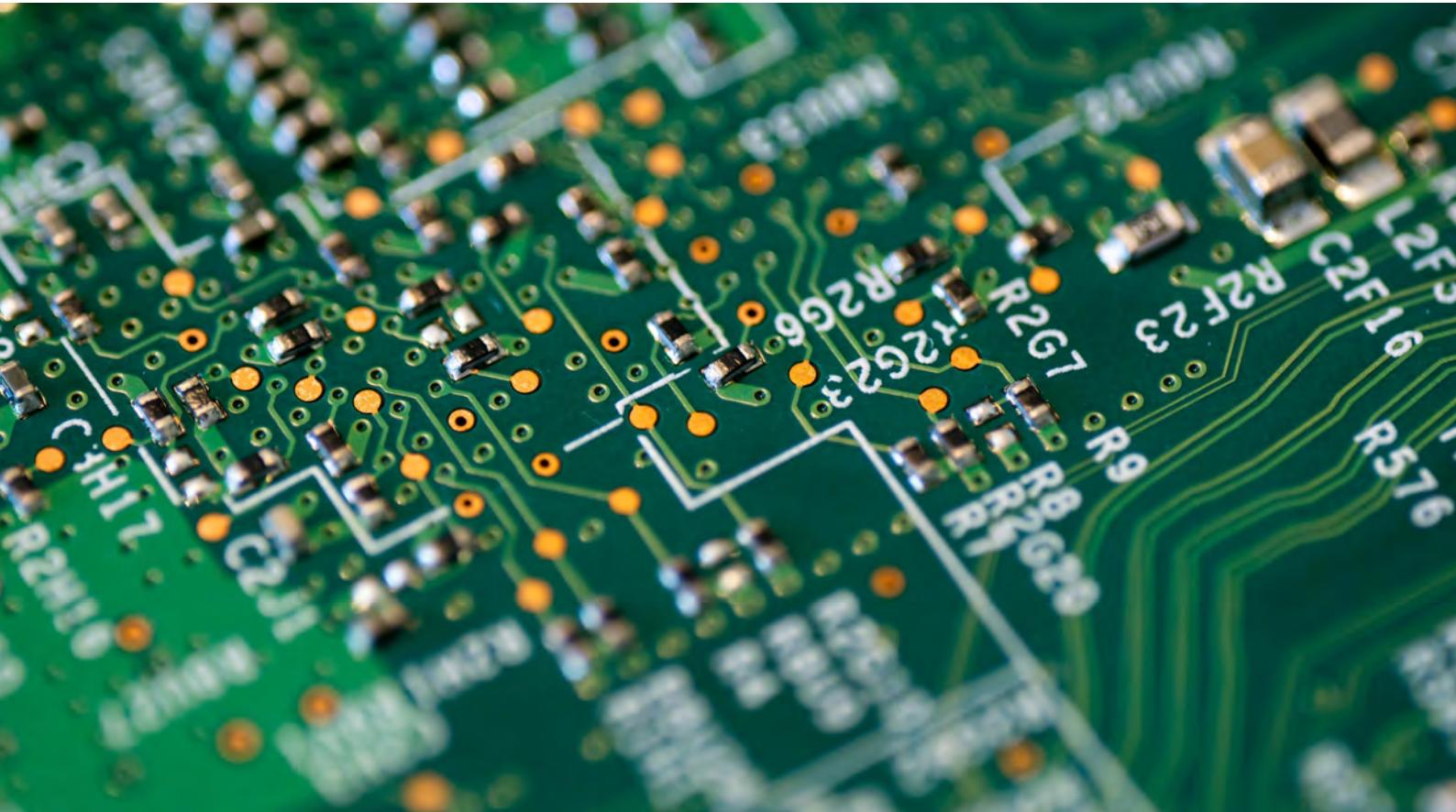
- **New public-private partnerships.** Public-private partnerships are evolving by incorporating increased risk sharing, data sharing and insight sharing, moving from consultation to joint efforts to shape responsible technology ecosystems. These partnerships exist along the spectrum from communities involved in early-stage innovation to larger companies.
- **International regulatory cooperation.** Digital technologies know no borders. Governments should collaborate internationally on regulating innovation by sharing knowledge and pooling resources. The Agile Nations, of which the World Economic Forum is an observer, seeks to drive intergovernmental regulatory cooperation.²⁰⁵

Designing digital-ready policies

Digital-ready policies are created with digital developments in mind to ensure they are future-proof and equipped to deal with the impact of technological advances and digitalization.

Strategies for operationalizing this pathway include:

- **Assess the readiness.** Existing and new rules must be reviewed to determine whether they can be implemented using the latest technologies.
- **Scan the horizon for future trends.** Recent developments should be considered to extrapolate how they may evolve. For example, what would make policies ready to manage the metaverse?
- **Expand capacity of policy-making institutions.** At a minimum, relevant stakeholders must understand current technology and take advantage of new technological capabilities in their policy-making methodology.



“ Emerging technologies hold significant potential to improve regulatory processes, but they are currently underused.

Deploying technology in support of regulation

Regulation and reporting represent a large investment for businesses. Emerging technologies hold significant potential to improve regulatory processes, but they are currently underused.

Strategies for operationalizing this pathway include:

- **Invest in regtech.** The Global Future Council on Agile Governance is developing use cases and a roadmap for using regtech to improve processes for heavily regulated industries. This will help governments and business to understand why and how they can apply emerging technologies to regulation, for example through machine-readable code or natural-language processing.
- **Foster government-driven consistency.** Even when governments do not have a direct regulatory role, they can foster consistency and clarity for voluntary mechanisms. This includes enhancing public risk management and government frameworks, as well as providing public data (see “Reuse data”). For example, government-driven consistency in ESG reporting can help limit the potential of greenwashing.
- **Reuse data.** Instead of business needing to establish duplicative data collection and measurement for compulsory and voluntary regulation, authorities can enable business to use public databases (with appropriate safeguards) to help shape digital governance. This can decrease ambiguity and increase consistency of reporting with comparable and verifiable data.

Artificial intelligence for humanity

Equity and inclusion must be addressed throughout the AI life cycle.

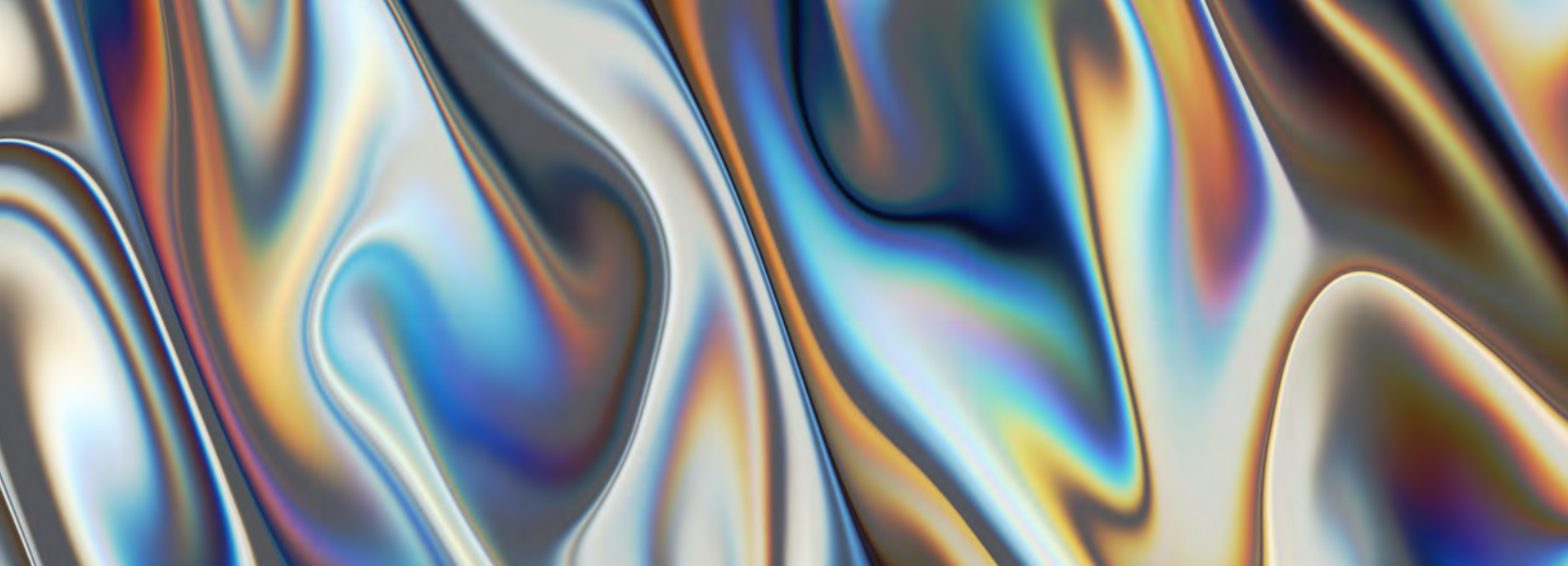


In response to the growing backlash against harmful applications of AI systems, industries, governments, academics and civil society representatives have created numerous resources to encourage the responsible development and use of AI across sectors and geographies. While the long-term impact of AI – especially on marginalized groups – is yet unknown, engagement in design and policy development is largely absent in communities most directly affected by automation and other AI applications. A new blueprint for conceptual design, programmatic development and governance of AI is needed to include diverse perspectives at the table and mitigate risk of harm in deployment.

Three areas to address include:

- **Skills and knowledge gaps.** Under-represented groups receive less information about AI, creating a barrier to entry for advanced degrees, jobs, and economic growth.
- **Entrenched bias.** AI systems and related public policy designed by homogeneous groups fail to account for adverse impacts of the technology's use in the broader world.
- **Rapid digital transformation.** Companies adopt strategies without proper governance of training, testing and deployment to promote safe, equitable and inclusive practices.

Equity and inclusion must be addressed in every corner of the AI life cycle to ensure that the development and use of AI technologies serve all of society.



Vision 2025

Increasing representation

Given the reach of AI, it is critical to ensure individuals and communities have a basic understanding of AI, are protected from algorithmic bias, and are able to benefit from AI's myriad benefits. A more representative AI ecosystem will prioritize responsible technology, demystify AI and harness innovation to contribute to a more equitable world.

Access to knowledge

- Governments should mandate accessible AI/tech literacy programmes in diverse languages for all citizens, with greater attention on more heavily affected communities.
- Companies should offer mentorship and continuous skills development programmes.
- Society should gain greater awareness of potential harm, and understanding of when and how AI is used.

Equity and diversity at the decision-making level

- The global South should be recognized as having an equitable stake in the design, development and financial return of AI.
- Decision-making bodies should be diverse in composition and implement best practices in inclusion throughout the AI life cycle.

Opportunities for consultation

- Design, development and use should involve all stakeholders, especially women, girls, people of colour, persons with disabilities, displaced populations and other under-represented groups.

Ensuring equitable outcomes

Given the potential for AI systems to affect all lives, it is critical that these systems employ fair processes and produce equitable outcomes. This can be supported by appropriate training, business practices, regulations and tools, such as comprehensive impact assessments of proposed systems.

Technical solutions for bias and fairness

- Ensure that explainability, transparency, robustness, bias and fairness principles are integrated into programming standards, protocols, logic and encryption.
- Ensure cloud platforms and stacks are upgraded appropriately to address bias and fairness.
- Define success and measure progress through specific key performance indicators (KPIs).

Holistic approaches to promoting fairness

- Ensure equitable access to infrastructure.
- Ensure that data are produced and code is signed by impacted communities.
- Obtain informed consent from users of the AI systems, and make options for redress and debate available.

Deploying AI benefits for all stakeholders

What is considered beneficial in one community may be considered harmful in another. Seemingly innocuous pieces of personal information in AI applications can be damaging if used for

“It is critical to ensure individuals and communities have a basic understanding of AI, are protected from algorithmic bias, and are able to benefit from AI's myriad benefits.”

misinformation campaigns or government control of citizens. It is crucial that the provision of data or use of AI is made explicit along with a technology's proposed benefit. Companies should enable users to opt out of an AI system if its proposed benefit is not valued by users, or if potential harms are seen to outweigh benefits.

AI is developed and used with a beneficial purpose in mind

- Socially beneficial use cases are clear.
- Indigenous governance, traditional knowledge and perspectives of marginalized groups are integrated into organizational and technological decision-making.
- Alternative options are available to stakeholders who prefer to opt out of AI use.

Benefits of AI are known, accessible and shared across social groups

- Benefits of AI are clearly articulated to stakeholders.
- Stakeholders have access to AI social entrepreneurship programmes.

AI is beneficial even to groups without a voice

- AI development prioritizes a transgenerational focus to benefit and not harm youth or future generations, in alignment with human rights and the SDGs.
- AI's effect on the environment is measured and minimized.



Pathways to Vision 2025

Breaking linguistic barriers

Most of the information on emerging technologies is written in English, which creates a barrier of entry to AI jobs and monocultural AI products and policy, both of which serve to limit the beneficial opportunities of the technology.

Strategies for operationalizing this pathway include:

- **Place linguistic diversity at the core of AI strategy.** As access to knowledge depends on language, give precedence to non-English educational opportunities as the foundation of national or corporate AI strategies, and provide more visual messaging.
- **Enable shared vocabulary across stakeholders.** Encourage interaction and collaboration across developers, business teams, civil society and consumers to ensure the entire AI ecosystem uses a shared vocabulary.
- **Improve technical capabilities in various languages of AI technologies.** Leverage and expand on technological advances in translation through expanded training sets and funding of AI-based text recognition in new languages.

Expanding education and training opportunities

AI impacts everyone, yet few specialists have the requisite knowledge and training. Education systems, public entities and businesses must promote the acquisition of skills and competencies required for an AI-powered society. This will stimulate innovation and new ways of seeing, valuing and using AI.

Strategies for operationalizing this pathway include:

- **Embrace a holistic approach.** Formal and informal educational communities integrate AI learning, regardless of school, company or socioeconomic status, in culturally appropriate ways.
- **Make AI education engaging.** Straightforward, exciting and engaging education, integrated into arts and humanities pedagogy, will contribute greatly to increasing diversity in the AI ecosystem.
- **Implement role-specific training on AI fairness.** Employees in all departments should receive basic information on what AI

“ Education systems, public entities and businesses must promote the acquisition of skills and competencies required for an AI-powered society.



is, what it can and cannot do, and how they can influence outcomes. The World Economic Forum White Paper entitled “A Holistic Guide to Approaching AI Fairness Education in Organizations” offers recommendations on how to implement this.²⁰⁶

- **Reach the public sector.** Supporting education improvements in the public sector is essential to ensure good AI governance and the implementation of responsible AI policies.
- **Apply a systems-thinking approach.** The potential unintended consequences of AI technologies should be mapped out, moving away from a transactional view that positions businesses and innovators at the centre of technology agendas, conversations and development.
- **Encourage continuous learning.** AI education is accessible and encouraged from grade school through professional education in a range of formats, including certifications.

Building vital AI infrastructure

Private- and public-sector actors must co-develop critical infrastructure, from data storage to fora for dialogue with diverse sectors. This foundation will enable nations currently lagging in AI maturity to leapfrog ahead, both in their economy as well as their efforts in governance. It would also offer companies universal consumer engagement to help shape and improve AI systems.

Strategies for operationalizing this pathway include:

- **Prioritize the set-up of AI infrastructure to fully deliver impact to all communities.** National governments, together with cloud providers and chipset companies, lead on infrastructure and data training projects to facilitate communities receiving the benefits of AI. This will be particularly crucial in countries lacking robust electronic data storage, where

additional resources will be needed to transmit information from paper to digital storage.

- **Establish feedback channels for impacted stakeholders.** Creating opportunities for increased communication between AI creators and consumers will be important, as will communicating ways in which feedback has resulted in changes to the AI system. It is also important to empower facilitating organizations (e.g. consumer groups) and to offer opportunities for redress.
- **Empower the participation of stakeholders in decision-making.** Rather than passive community participation as currently employed (often part of user experience [UX] testing), an “inclusive by design” methodology should be embraced. Impact assessment tools should be deployed wherever possible and an agile approach to feedback adopted, including via social media.

“ Private- and public-sector actors must co-develop critical infrastructure, from data storage to fora for dialogue with diverse sectors.



Media, entertainment and sport

With almost 4 billion users consuming media, entertainment and sports content daily, these sectors have enormous potential to influence people's perspectives and livelihoods.



Several trends are accelerating the media industry's role in shaping the world:

- **Digital safety.** Harmful content, conduct and contact have proliferated online and pose huge risks to all internet users, particularly vulnerable groups such as children. Social platforms have made it easier to create and distribute all types of information, but this has also resulted in harmful and illegal content.
- **DE&I.** The decisions people make about how they create content, whose stories they share and what narratives and perceptions they shape will have a lasting impact on society. Advancing DE&I in media and entertainment is crucial to creating a more equitable, just society.
- **Metaverse.** The metaverse refers to a set of concepts and trends that, some experts believe, represent the next major computing platform. Central to the idea is extended reality (XR), defined as “a combination of augmented, virtual and mixed reality environments that are accessible and interactive in real time”.²⁰⁷ When combined with blockchain applications, XR could blend the physical and digital worlds to increasing degrees, enabling new forms of social and commercial interaction, creativity and value creation. This hybrid environment – the metaverse – may eventually become an extension of the real-world economy, transforming consumer experiences and business models across industries.



Vision 2025

Advancing digital safety

Mechanisms and tools for public-private cooperation:

- Stakeholders define harmful content differently; areas such as hate speech, sexual exploitation and misinformation are not understood uniformly across platforms and national jurisdictions.
- Regulators, companies and other stakeholders need to productively tackle these challenges in a collaborative way and address underlying safety tensions and trade-offs.

Industry accountability and effective regulation:

- Industry accountability and oversight are currently lacking: no comprehensive third-party auditing processes and practices to evaluate accuracy or the effectiveness of content moderation practices and policy enforcement exist.
- Regulatory schemes are no longer fragmented national approaches that increase cost, complexity and uncertainty for businesses, especially smaller players. Alignment on a global or multi-jurisdictional regulatory framework has significantly helped in this regard.

Safety principles to guide trade-offs, interventions and measures:

- Alignment on common digital safety principles is fundamental to shape policies and processes for balancing safety, privacy, free expression

and security online as well as delineating responsibilities between the public and private sectors.

- There is an agreed upon risk-based framework for the optimal use of interventions, such as content removal and account suspensions.
- An industry-wide accepted measure of user safety on digital platforms exists.

Ensuring diversity, equity and inclusion in media

Accurate portrayals in content:

- In-content diversity is directly seen, heard or experienced by the audience. Measurements may focus on the number of diverse characters and their time on-screen, or portrayals or the stereotypes that are challenged or perpetuated.
- Diverse characters and fair portrayals allow audiences to hear their stories being told in an authentic manner. Ads, games, videos and other forms of media can have harmful unintended consequences when they portray groups in a certain way or reinforce stereotypes.

Diversity and representation in creative roles:

- Creative diversity is vital to creating content that reflects the lived experiences of diverse audiences. It is important to assess who is creating the content, who is greenlighting it,

and what cultures exist around that content to meaningfully measure how the output reflects its audiences.

Measurement and transparency:

- This requires the ability to measure DE&I impact based upon data and transparency from organizations. An objective and neutral service to measure the state of diversity in the industry is critical for benchmarking and assessing success and opportunities for improvement.
- Audience sentiment is an effective metric for successful representation as it can be influenced and assessed quickly.

Governance and value creation in the metaverse

Several fundamental technologies come together in an integrated, interoperable and inclusive

way, transforming consumer experiences, value creation and business models across industries.

The World Economic Forum Global Future Council on Media, Entertainment and Sport supports efforts in two areas:

- **The governance of extended reality (XR).** This involves working on policy frameworks for XR systems; promoting equity, inclusion and accessibility; ensuring economic opportunity and interoperability while preserving user privacy; and reducing potential harms in immersive environments.
- **Value creation in the metaverse.** This involves defining how assets are designed, advertised, marketed and sold; mapping value chains, IP and investment models and trends influencing the landscape; realizing the potential of the creator economy; identifying incentives and risks in developing the metaverse; and analysing the metaverse's impact on society and culture.



Pathways to Vision 2025

Harnessing public-private cooperation to advance digital safety

Advancing public-private cooperation on tackling harmful activity online will be critical as current measures do not effectively attribute accountability to the relevant players in the ecosystem.

Strategies for operationalizing this pathway include:

- **Join the Global Coalition for Digital Safety.** This coalition aims to “accelerate public-private cooperation to tackle harmful content online and exchange best practices for new online safety regulation, take coordinated action to reduce the risk of online harms, and drive collaboration on programmes to enhance digital media literacy”.²⁰⁸ The coalition is working towards:

1. **A global charter of principles for digital safety:** Designing underlying principles and responsibilities for governing digital safety across the public and private sectors, guiding decision-making that requires balancing privacy, safety and security
2. **A toolkit for digital safety interventions:** Exploring digital safety interventions as well as preventative measures across the public and private sectors; outlining appropriate usage based on various risk factors
3. **New measures and standards for protecting vulnerable groups online:** Identifying mechanisms that are particularly used to target vulnerable groups, and drive international standards in addressing these successfully; outlining more effective measures to assess how safe users are

“ Advancing public-private cooperation on tackling harmful activity online will be critical as current measures do not effectively attribute accountability to the relevant players.

on a given product or service, particularly given that current measures do not capture outsized harm to vulnerable groups

- **Ensure digital safety and protection by design in the metaverse/Web3.** As the exploration of how to operate safely in the metaverse progresses, it will be imperative to consider digital safety components from the outset to create safe online spaces and avoid replication of existing safety limitations in Web2 and social media.

Improving diversity and representation in content and creative production

Strategies for operationalizing this pathway include:

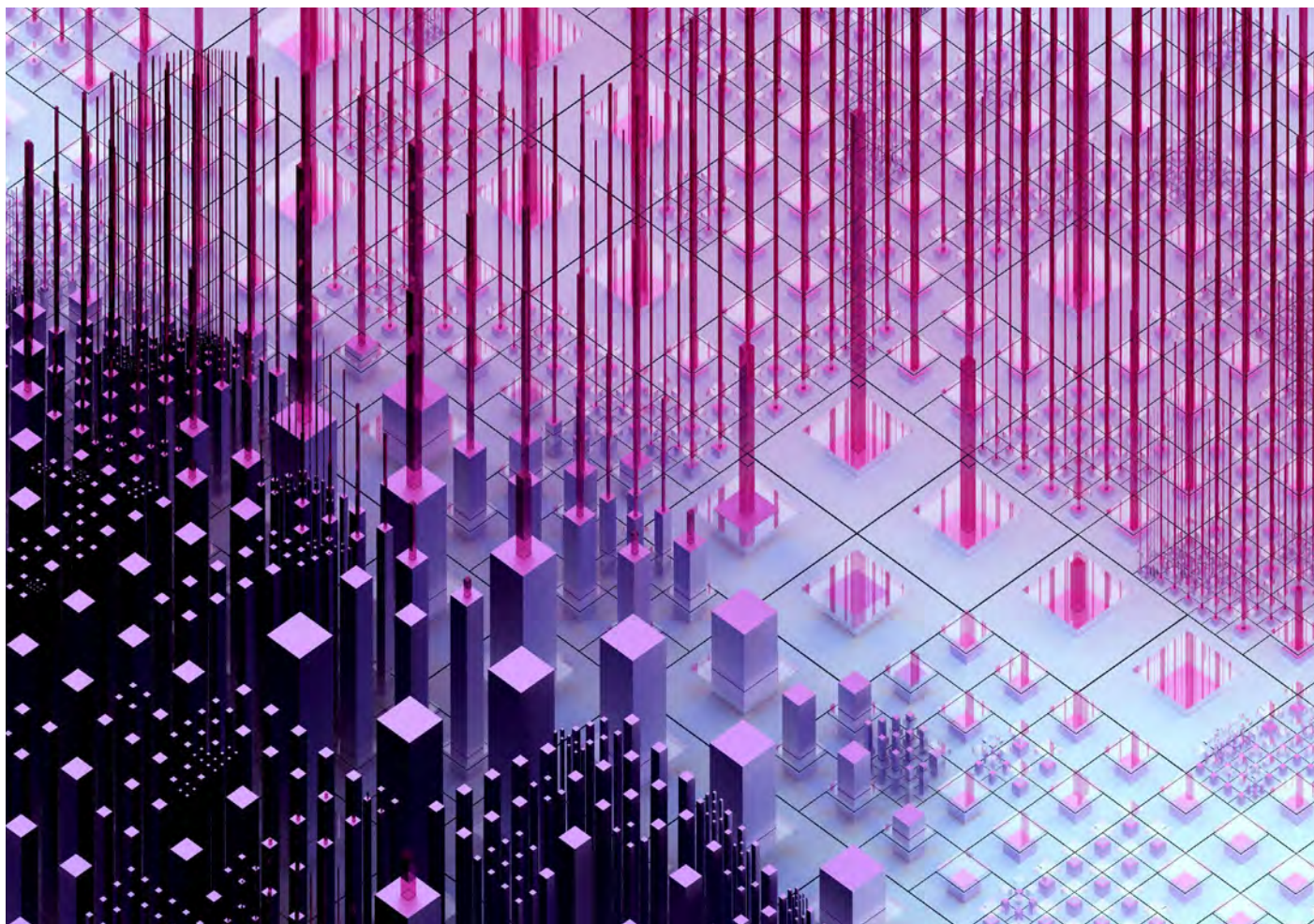
- **Join the Power of Media taskforce and follow guidance for improving measurement, transparency and accountability.** Diversity data from companies can be aggregated and published to create a sense of urgency and internal pressure for other organizations. The companies that voluntarily report their diversity data can gain the trust and favour of consumers and investors. A common set of metrics and goals across sectors can help to hold all players accountable. It is widely agreed by the taskforce that audience sentiment and
- **Use the cross-sector index.** Building on the Diversity Representation Maturity framework, a cross-sector index that measures audience sentiment and demographics can be used to compare the attitudes and behaviours of diverse identity groups. This index will help to enable the adoption of best practices and develop insights into where progress is lacking. Refreshing it periodically could illustrate the collective progress and impact by sector. The first Audience Representation Index serves as a baseline for the industry to better measure and advance the state of diversity and inclusion.²¹⁰
- **Prioritize inclusivity in the metaverse.** The generation leading the growth on the metaverse will not tolerate non-inclusive creative content. Intentionality, transparency and accountability are critical to truly represent audiences and empower creators in the metaverse. The optimism on DE&I needs to be acknowledged to create an inclusive environment in the metaverse, where organizations will need to lead by example to create an equitable future enabled by technology and innovation.

demographics can be prominent measures of the DE&I footprint. The taskforce has developed a Diversity Representation Maturity framework to instil a clear, well-defined structure around the components that constitute effective diversity and inclusion in the media and entertainment industries.²⁰⁹



Quantum computing

The path to scalable, commercial quantum computers will become increasingly clear in the next five years.



The potential of quantum science and technology could be as transformative as semiconductors in the 20th century, with massive economic impact in sectors ranging from information and communications technology to healthcare, for example. The technology is in its early stages, with many options for underlying platforms. Due to this emerging state, the road ahead is uncertain.

Three key trends are bound to drive the rapid change and require action from the international community:

- **Rapid growth in venture financing and large public (state) investments.** This will lead to high expectations, strong competition for talent, and economic and geopolitical policy interventions.
- **Growing quantum ecosystems.** University-affiliated ecosystems will continue to drive hardware, software and application development.

- **Emerging market for first-generation noisy intermediate-scale quantum (NISQ) computers.** This is driven by early adoption and experimentation across the public sector and industries.

The path to a scalable and commercial quantum computer will become increasingly clear in the next five years. Many system improvements are expected, including a sizeable increase in the number of qubits and better error-correction techniques. Algorithms for use cases are under development for hybrid quantum-classical systems, and numerous tools for the supporting quantum infrastructure stack are emerging. As quantum computing holds potential to redefine power structures, the international community should act now to guide it in a responsible way rather than exacerbate geopolitical tensions.



Vision 2025

Developing commercial applications and quantum solutions

A bold vision for 2025 includes a clear pathway towards a viable demonstration of quantum advantage, wherein a quantum computer solves an application of interest cheaper, faster or more accurately than a classical computer. The first demonstrations of potential quantum-computer-enabled results that are beyond the capabilities of the highest-performing classical computers will be achieved. A pathway towards a proof-of-concept contributing quantum computing solutions to global problems – for example, modelling climate change or finding new materials to use in the energy transition – leads to a future where quantum computing will become a necessary part of all computing frameworks.

To achieve this, the availability of the relevant algorithms as well as the necessary near-term quantum hardware and supporting classical infrastructure, is required. At that time, end users will be positioned to scale the achieved proofs of concept(s) and further reinvest to enable other demonstrations.

Reaching the quantum advantage through a trusted ecosystem and community

In this vision, international tension related to critical technologies exists due to economic competition and geopolitical manoeuvres that undermine fair and open competition. A growing consensus emerges that quantum computing will create value as progress continues to shift from basic research to commercial developments in established companies and new start-ups.

The Vision 2025 is to create an open, trustworthy and fair global marketplace that provides an ecosystem for robust competition for both the development and use of quantum computers.

This means all governments, companies and individuals are treated fairly and equally while protecting the intellectual property (IP) of all parties. In turn, it requires a robust supply chain for components, as well as competitive and accessible (open-source) software with clear standards and benchmarks so that competing hardware and software can be meaningfully compared. This could include as diverse a set as materials, equipment for fabrication, the key quantum components, control electronics and cryogenic equipment, and software layers and algorithms.

To enable this, a coalition of like-minded countries signs a “Quantum Act” with a governing framework for collaborative research and development, export controls, talent development and exchange, with the necessary funds and organization to support implementation. The goal is broad trade agreements between nation states and international markets that foster trust, transparency and equity and that encourage technology access for countries of all economic statuses. Specific roadblocks that prevent international collaboration and the free flow of ideas and scientific know-how should be overcome.

Defining common ethical standards on the use of quantum computing

The transformative potential of quantum computers accelerates the need to anticipate and define common ethical standards that will frame the future use of these machines. This is foreseen as a key area of work for the next several years.

Before 2025, representatives from the quantum computing industry, research organizations and different governments meet and reflect on the core ethical foundations of the technology. A constructive dialogue leads to regional and even international consensus on ethical use principles, such as accessibility, equality, inclusiveness, transparency, accountability and the common good. Consensus also extends to inappropriate use made possible by the future use of quantum computers.

“ The Vision 2025 is to create an open, trustworthy and fair global marketplace that provides an ecosystem for robust competition for both the development and use of quantum computers.

Pathways to Vision 2025

Increasing the number of quantum learners

To meet the needs of the growing quantum computing industry and accompanying basic research, a larger workforce is necessary worldwide. This requires training a new cohort of quantum specialists, including current professionals and future graduates. Efforts should be made to encourage diversity and inclusion.

Strategies for operationalizing this pathway include:

- **Equip the current workforce.** This involves fostering open science and exchange programmes and establishing dedicated training programmes to teach the current

workforce about standards, benchmarking and new areas of the field.

- **Educate the future workforce.** Efforts to expand education include increasing the number of undergraduate and graduate programmes offering courses in quantum computing, as well as introducing quantum computing basics in secondary education.
- **Attract a broad and diverse workforce.** Vital to ensuring fair, excellent quantum products and services that cater to global communities, this can be achieved with outreach programmes in secondary and post-secondary education, online platforms and courses that can reach a global and diverse audience. Targeted initiatives to increase diversity (especially gender) and inclusiveness can also be part of this strategy.



Investing strategically for optimal growth

To support a sustainable framework for growth in quantum computing globally, resources and activities from public- and private-sector entities must be optimally aligned. A reliable overview of the global technology landscape, as well as the coordination of public- and private-sector investment and activities, can lead to more efficient resource allocation and an acceleration of the technology and its use.

Strategies for operationalizing this pathway include:

- **Monitor the global technology landscape.** Neutral positional papers (“State of Quantum report”) should be produced that document existing global national quantum investment strategies as well as industry development roadmaps, and identify opportunities for optimal future investments.

- **Align investment strategies.** Public- and private-sector investments should be balanced by allocating government funding in broad infrastructure projects, long-term research and overarching societal use cases.
- **Foster cooperation between the public and private sectors.** Public- and private-sector actors can increase their interactions, as academia and national labs bolster private industry development and pave the way for future ideas and innovations. This also helps enable a cohesive and collaborative global ecosystem with room for protecting IP.

Establishing a framework for international collaboration

To help global industry and markets develop and support common goals and values, it is imperative to start building the framework and governing principles for this market now. A balance is required between open science, the free flow of

“ To appropriately enable an ecosystem to harness quantum advantage in a fair and ethical way, it is critical that parts of the quantum computing stack are developed in open source.

talent and ideas, and the protection of shared values, such as respect for IP arrangements and responsible use of technology. To this end, existing bodies, such as standardization groups, will need to consider quantum computing as part of their mission, and new frameworks will need to be established to guide the development of quantum computing systems.

Strategies for operationalizing this pathway include:

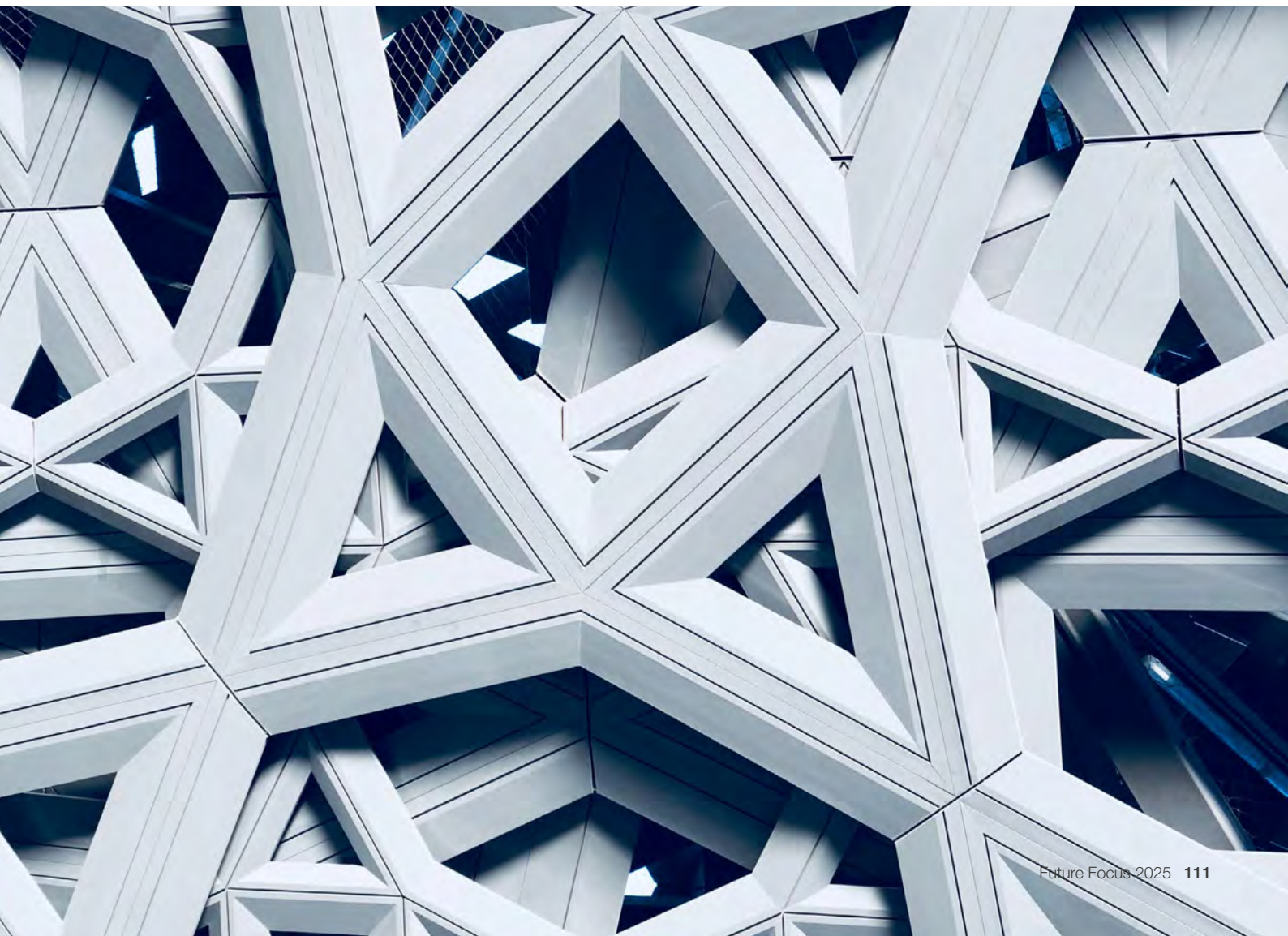
- **Establish a trusted community.** A group of experts from academia, industry and government should be convened to serve as the initiators of the trusted community. This group should implement tangible actions that accelerate the trusted community, such as membership models and screening procedures for investors and companies.
- **Establish an international coordinating body.** It should involve all major ecosystems and initiate the actions needed, with a special effort to include less advantaged countries and societies.
- **Create internationally accepted standards and benchmarks.** This will help to foster transparency over the efficiency of available hardware and software solutions.

Developing open-source resources for standards and software

To appropriately enable an ecosystem to harness quantum advantage in a fair and ethical way, it is critical that parts of the quantum computing stack are developed in open source.

Strategies for operationalizing this pathway include:

- **Create open access to quantum systems over the cloud.** Resource estimation for applications of interest should be transparent, and open-source software communities need to help ensure equitable access and learning in quantum computing. Many existing open-source projects in this space can be developed further.
- **Stimulate the development of open-source quantum computing tools and software.** Open-source software communities can help ensure equitable access and learning in quantum computing.
- **Safeguard open science.** A diverse and global community of researchers should be maintained to build and investigate underpinning science, technology and applications of quantum computing.



Scientific collaboration

Global scientific collaboration is necessary to tackle global challenges, from climate change to health.



The COVID-19 pandemic demonstrates once more that global scientific collaboration is necessary to tackle global challenges, from climate change to health. Innovative solutions require contributions from a diverse array of countries, disciplines, sectors and backgrounds to ensure access to the best talent, knowledge and data available, and to a variety of perspectives.

Three trends in scientific collaboration stand out:

- **COVID-19.** The pandemic has disrupted many aspects of research. As the world establishes a “new normal”, there is an opportunity to decide which changes may improve the research system. The pandemic also provides lessons for dealing with other shared global challenges, like global warming and cybersecurity.
- **Retreat from multilateralism.** Reduced collaboration between countries impedes collaboration between their scientists.

Some barriers are put in place deliberately by governments to prevent contact with people from other countries. Some are by coincidence, such as reduced mobility due to closed borders. All make it more difficult for scientists to collaborate internationally.

- **Balancing fundamental and mission-driven research.** Most countries increasingly prioritize mission-driven applied research. This favours research focused on specific goals, such as developing a COVID-19 vaccine, at the expense of open-ended, curiosity-driven basic research that generates the fundamental knowledge to fuel future mission-driven research.

Approaches to these and other trends will shape scientific progress for decades to come. They will affect the type, quality and amount of knowledge produced, who gets trained to produce it, the level of technological innovation and, ultimately, humanity’s ability to respond to future global crises.

Vision 2025

“Open science is a crucial tool to ensure scientific progress across the world and thus reduce inequalities.”

Ensuring scientific infrastructure and funding

Science is a public good that relies to a large extent on public investments in research to run laboratories and train the next generation of researchers. Scientists gravitate towards research for which funding and infrastructure are available, making the development of scientific infrastructure and the availability of funding two of the most direct ways to influence the direction of scientific research. A proper balance between funding for mission-driven and for fundamental research ensures both short-term and long-term scientific and technological progress.

International collaborations currently face high barriers to success, as most countries focus on funding domestic research initiatives. A multilateral approach to scientific funding enables larger, more ambitious projects that no single country can accomplish alone. The economic fallout of COVID-19 and reduced multilateral collaboration may spur governments to cut funding for international scientific collaborations and projects. These decisions will jeopardize scientific progress, preparedness for future global crises and the scientific diplomacy which arises from international collaborations.

Disseminating knowledge

In order to collaborate, scientists must be able to easily share their findings and data. While scientists have traditionally shared knowledge with one another through peer-reviewed journal articles, high subscription fees make most of the journals inaccessible to scientists in lower-income countries. Open science is therefore a crucial tool to ensure scientific progress across the world and thus reduce inequalities. Several platforms exist to circumvent these limitations:

- Open-access journals make their articles freely available to readers without a subscription; researchers or their institutions, however, must pay to publish in them.

- Pre-print servers allow free publishing and access to papers but without pre-publication vetting, leaving it to the reader to evaluate a paper's quality.
- Open data repositories allow the direct sharing of data. A lack of standards for these repositories, though, means that their quality varies widely, and that data cannot easily be shared across different platforms.

Promoting scientific communication and literacy

Effective and transparent communication of scientific findings, from public lectures to Wikipedia edit-a-thons, can improve collaboration between scientists and make science accessible to the public. This brings new perspectives to scientific endeavours, allowing for thinking that more directly addresses the needs of the wider community, from citizen science initiatives to industrial partnerships. On the other hand, poor scientific communication can contribute to misinformation and reduce trust in science. Developing scientific literacy, through both the education system and interactions between scientists and the public, can help promote trust in and support for science, and collaboration across sectors and borders.

Ensuring academic freedom and integrity

Academic freedom and integrity are integral to the pursuit of scientific research. It is not possible to conduct productive collaborative work where partners may lack the full right to freedom of speech and opinion. The COVID-19 pandemic gave rise to cases where public health measures were hindered by national pressure. Climate change also provides examples where restrictions preventing government scientists from talking about climate science slowed action.



Pathways to Vision 2025

Targeting scientific funding to support collaboration

Public- and private-sector funders, together with government, must collaborate to develop a strategy to support both domestic and international science.

Strategies for operationalizing this pathway include:

- **Create a long-term strategy for scientific collaboration.** Governments must work together to support international collaborative research in an enduring manner. This strategy should be designed to resist changes in governments and the political climate. Key elements include a plan to support durable access to and sharing of high-quality data and other scientific results, and infrastructure investments, such as international labs and research facilities enabling collaborative research in different disciplines.
- **Increase cooperation between governments and industry.** Governments should promote the participation of industry in funding scientific collaborations. At the same time, scientific endeavours should be transparent and free from undesired industrial, economic, and political influence.

“ Governments should promote the participation of industry in funding scientific collaborations.

Key areas that warrant attention include broad agreement on IP protection, regulatory oversight, and data privacy protection.

Facilitating free movement of people and data

Some types of collaboration must take place in person, such as training personnel in teams or using specialized facilities. Even remote collaboration requires data sharing. This can be hindered by restrictions on sharing certain types of data, for-fee databases, or by lack of access to digital tools among some collaborators. Therefore, facilitating the free flow of people is essential for scientific collaboration.

Strategies for operationalizing this pathway include:

- **Lift travel restrictions.** Within the current context of managing the COVID-19 pandemic, restrictions on international travel must be minimized. After the pandemic, all countries must ensure the free movement of researchers as a prerequisite for scientific collaboration.
- **Support open data.** Removing legislative roadblocks to open data sharing and



supporting the necessary infrastructure to ensure long-term access to data are essential for scientific collaboration. The FAIR Guiding Principles for scientific data management and stewardship²¹¹ could provide a framework for this pathway.

- **Harmonize data-sharing protocols.** Where completely open access to data is not feasible, countries can harmonize protocols for data sharing so that scientists can access them in a timely manner, no matter their location. This necessitates building a culture of trust and responsibility among the institutions and governments sharing data, including mutually-agreed arrangements on how countries can share data and IP.

Improving public awareness of and trust in research findings

Research organizations and governmental institutions and industry must work together to support effective scientific communication with the public to foster trust and eradicate misinformation.

Strategies for operationalizing this pathway include:

- **Protect the independence of scientific institutions.** Collaboration between scientific and government institutions is important for addressing national and international challenges and for implementing science-based policies. Scientific institutions must

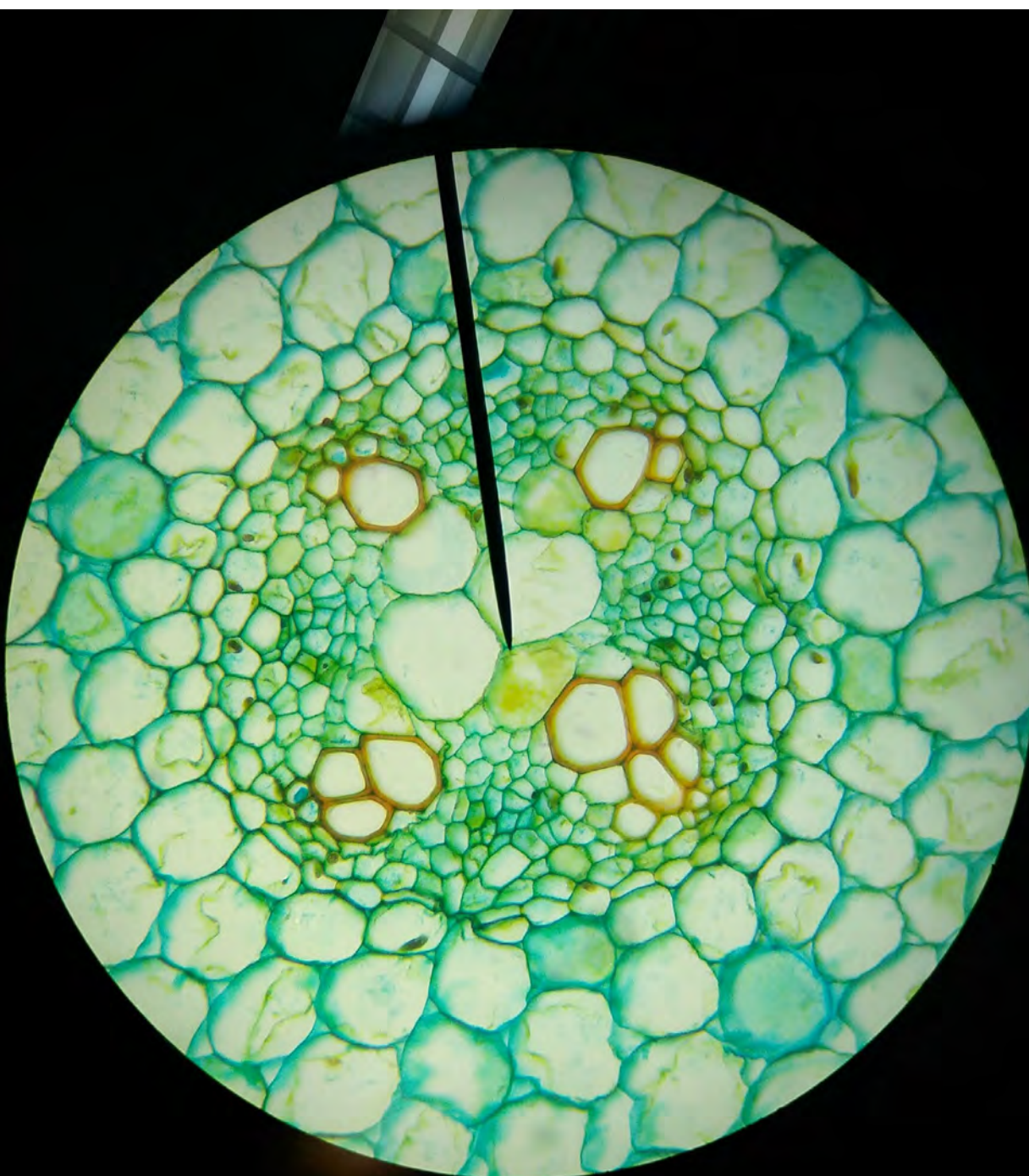
“ Research organizations and governmental institutions and industry must work together to support effective scientific communication with the public to foster trust and eradicate misinformation.

have the necessary independence from governments, however, to promote scientific findings even when these do not support their government's policies and to advocate for policies in line with scientific findings. This independence must be communicated to the public to avoid association of scientific institutions with a particular government and the resulting politicization of scientific findings and recommendations.

- **Increase diversity in scientific institutions.** Increasing diversity – and particularly among decision-makers within those institutions – will bring a more diverse set of views to the table when making decisions about research strategies and the allocation of funds. This includes representation of groups historically under-represented in science, such as a

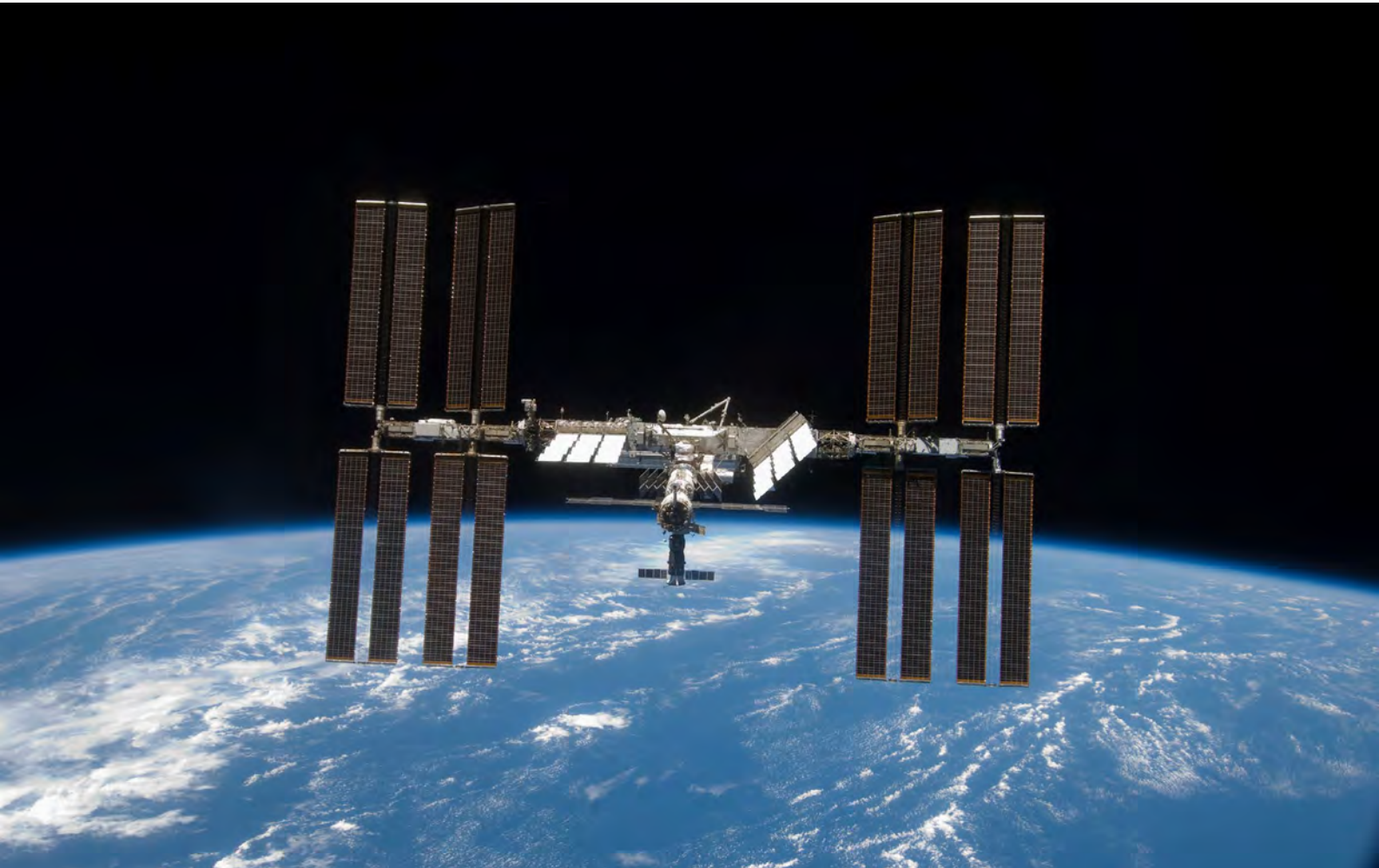
balanced representation of genders, a wider array of ethnicities and nationalities, and diversity in other areas of life, such as age, career stage, physical disability and field of study. In medical science, increased female representation has led to more research into women's health issues, improving the health of women and other people suffering from conditions like osteoporosis and migraines.

- **Support social science.** Effectively translating scientific findings into the real world requires an understanding of the different social settings in which they will be applied. Science funders can promote this by supporting collaborations that include social scientists who have knowledge of and connections to the communities where scientific knowledge is being created and findings are being implemented.



Space

Accessing space for the benefit of the economy and society on Earth is easier than ever.



“ New manufacturing approaches, streamlined assembly and reusability have lowered launch costs and spurred new rocket companies.

Space is facing accelerated change that is likely to persist through 2025 and bring significant benefits as well as challenges for humanity. New manufacturing approaches, streamlined assembly and reusability have lowered launch costs and spurred new rocket companies, providing greater choice and lower prices to access and use space. Mass-produced, affordable and smaller satellites can be launched to perform meaningful missions and provide new services. As a result, accessing space for the benefit of the economy and society on Earth is easier than ever.

The key trends creating a more active and crowded space environment are:

- **High levels of private-sector funding and growing public-sector interest.** Private-sector investment and public-sector support enable the buildout of significant infrastructure in space, including commercial alternatives to the International Space Station, on-orbit space services and missions to the Moon and cislunar space.
- **Geopolitics in outer space.** Geopolitical rivalry is creating risk of conflict in orbit, posing enduring risks to the space environment.
- **Growing demand for global connectivity and Earth monitoring.** Greater internet connectivity (particularly to underserved, remote areas) and the availability of Earth monitoring data are prompting the development of new satellite constellations, especially within Low Earth Orbit (LEO). This proliferation requires appropriate regulatory approaches to prevent harmful radio-frequency interference, guarantee the long-term sustainable use of Earth orbits and ensure security against cyberattacks.
- **Climate change.** Earth monitoring data collected from satellites will become even more abundant and crucial to providing possible insights for the climate.

Vision 2025

Addressing space traffic and debris

A more congested space environment means safe operations and a sustainable environment for future space development and operations must be ensured. The problem becomes more acute as debris from high-altitude, anti-satellite weapons tests further increases the risk of collisions in orbit, reducing the projected lifetime of satellites and negatively affecting space industry economics. Satellite innovation and large constellations intensify the need for jointly developed and widely adopted norms of operation for space traffic interactions between space actors around the world. This will entail active and good-faith coordination among governments and the commercial operators licenced by them:

- Scientific and technical progress is needed to better characterize the orbital debris and enhance means to avoid collisions.
- Improved implementation of existing guidelines is required, as well as new best practices, technical standards and economic incentives to allow clearing debris from old missions.
- With easy access to capital, new opportunities exist for innovation in technology and techniques to improve the space environment. But there is also the risk that unsustainable business plans will be funded and that potential bankruptcies could create new challenges of managing and disposing of space assets.

- Further research, coordination, data collection and sharing are also needed in the field of space weather and its impact on space assets.

Finally, increased space activity has environmental consequences on Earth, including from accelerated launch cadence (burning of rocket fuel) and disposal of satellites (burning them in Earth's atmosphere, the current practice of removing satellites from LEO).

Coordinating space-based data to better tackle the climate crisis

Earth-sensing satellites enhance the understanding of earth science and the evolution of the planet's climate, helping to measure relevant climate change indicators. Satellite measurements of air and sea surface temperatures and of sea levels, as well as other space-based observations, reveal important consequences of a warming planet. While satellites provide vital data, gaps remain in full understanding, modelling, mitigation, adaptation and coordination. Multiple organizations conduct research into relevant climate change processes, but there is not yet an organization dedicated to the continual and integrated development of this core modelling field – earth systems modelling – and to embedding results in a physical visualization environment that can inform and help shape decision-making.

Beyond environment monitoring, space infrastructure plays a key role in supporting other ESG metrics. Data from space can help companies increase the efficiency of their operations and survey their overall supply chains.

“ Earth-sensing satellites enhance the understanding of earth science and the evolution of the planet's climate, helping to measure relevant climate change indicators.



Ensuring a space-for-space economy and space resources

Space resource mining on the Moon or asteroids, along with space-based solar power, represent long-term opportunities with potential to provide materials to construct space-based habitats and eventually to help address resource scarcity on Earth. A space-for-space economy starts to emerge, with services

such as space-based laser networks for inter-satellite and Earth connectivity, multiple space stations and habitats, in-orbit refuelling depots and advanced satellite servicing. To ensure sustainable and beneficial development, the character of outer space as a global commons domain must be respected. Current national political and regulatory approaches risk leading to disagreements among nation states and may result in either lower investments due to uncertainties or uncoordinated investments.



Pathways to Vision 2025

Encouraging sustainable behaviour in space

Governmental and non-governmental actors must further collaborate to address orbital traffic and debris, as well as consider environmental consequences on Earth of increased space activity. With a lack of universally accepted and binding comprehensive principles and norms in a fast-growing space economy in general, more is required to ensure safe operations and make space activities sustainable for future development and operations.

Strategies for operationalizing this pathway include:

- **Establish metrics to measure the sustainability of space activities.** The Space Sustainability Rating (SSR), developed by an international consortium of partners, is a voluntary framework to encourage and provide incentive to operators to behave responsibly in space by increasing the transparency of organizations' space environmental sustainability and debris mitigation efforts.²¹² The SSR will provide a space mission score measuring efforts to maintain a sustainable space environment, including debris mitigation and alignment with international guidelines. From 2022, an organization can obtain a rating for their mission from the EPFL Space Center (eSpace) at the Swiss Federal Institute of Technology in Lausanne, Switzerland.

- **Encourage implementation of international frameworks and best practices.** Long-term sustainability guidelines were adopted by the United Nations Committee on the Peaceful Uses of Outer Space (UN-COPUOS) and the UN General Assembly and further work is ongoing, while the UN First Committee recently adopted a resolution on voluntary norms of behaviour. The International Institute of Space Law, the International Astronautical Federation and the International Academy of Astronautics joined in a trilateral, multidisciplinary effort to design a space traffic management approach. For the past 12 years, the Space Data Association, which convenes both public- and private-sector satellite operators, has operated global, coordinated operational data sharing, improved collision warnings, developed best practices and identified capabilities for the next generation of space traffic management systems.

Additional global initiatives are needed to implement overarching frameworks that help manage the space environment. For example, the World Economic Forum Global Future Council on Space is preparing a concept for a space sustainability monitor (SSM), which is a tool to monitor, showcase and incentivize states' implementation of international frameworks and best practices to promote the safety and sustainability of outer space activities. In addition to getting information about a state's willingness to apply different standards and

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“ To harness the full potential of climate change data, its management, analysis and integration need to be improved.

regulations, the SSM will also incorporate the notion of a space traffic footprint, which will further encourage national actors to promote sustainable use of space by measuring the number of objects (active and in-active) in orbit.

- **Incentivize operators to reduce orbital debris.** “Net-zero” or debris reduction incentives, fee schemes, or escrow funds could help to reduce the creation of space debris. Also, penalties for littering and regulatory oversight for discouraging irresponsible behaviour and monopolistic business practices are needed.

Supporting the collation, management and analysis of climate data

To harness the full potential of climate change data, its management, analysis and integration need to be improved.

- **Establish an agency that leverages space technology and operations to better support climate action.** The Global Future Council on Space has developed a concept for an Earth Operations Centre (EOC), a facility to leverage space data and

expertise to conduct multidisciplinary science and engineering research to monitor and provide insights to manage climate change. The creation of this facility, as well as of a “digital twin” of Earth – a dynamic, digital replica of the planet already being explored by the European Space Agency and other organizations – will provide a powerful symbol of the commitment to address these challenges today, and to serve as the Earth’s climate hub on behalf of future generations.

Developing the space-for-space economy and harnessing space resources responsibly

The work of several organizations, such as the newly formed intergovernmental Working Group on Exploration, Exploitation and Utilization of Space Resources of the Legal Sub-committee of UN-COPUOS, or the non-governmental Hague International Space Resources Working Group, should be continued to further address and discuss the challenges of governance, technical safety and socio-economic benefits that will come with the development of a robust and sustainable space-for-space economy, including space resource extraction.



Synthetic biology

Synthetic biology develops tools and frameworks that enable the purposeful engineering of biology with greater precision, predictability, sophistication and speed.



🔗 **Broadening biological data sets and powerful biological engineering tools are accelerating the scope and scale of what is possible in the biosciences.**

Over 4 billion years, biology has evolved countless sustainable solutions, resulting in millions of species existing in ecosystems in harmony with planetary resources. People have learned new ways to interact with biology such that this inherent sustainability can be harnessed to develop new technologies that can benefit people and the planet. If employed thoughtfully and responsibly, synthetic biology applications can respond to the world's social, environmental and economic needs, and help solve global challenges, including transitioning to a more sustainable future.

Three key trends identified by the Global Future Council on Synthetic Biology are:

- **Growing bioeconomies.** Advances in synthetic biology are enabling many valuable applications. Investment in bio-based technologies, industries and economies is growing rapidly, though activity remains concentrated in a few regions.
- **Emerging biostrategies.** Countries, companies and other organizations around the world are focusing on advances in synthetic biology to help them recover from COVID-19 and to serve as an engine for new sustainable industries.
- **Platform-driven biosciences.** Broadening biological data sets and powerful biological engineering tools are accelerating the scope and scale of what is possible in the biosciences. Those who steward data and technology platforms in bioscience have significant power in this revolution.

The last two decades of synthetic biology have delivered new tools, approaches and communities. The challenge now is to develop the visions, pathways and partnerships that can realize the vast promise of benefits in the decades to come.

Vision 2025

Building a bioeconomy for everyone, everywhere

The potential benefits of synthetic biology are diverse, but they must be developed and distributed equitably. The vision for 2025 is that every country, including emerging and developing economies, has the capacity to build a bio-based circular economy, benefit from record investments and increase sustainability across sectors using synthetic biology. Every country can unlock new forms of value from their biodiversity; transition from polluting industries and practices to use more sustainable bio-based solutions across manufacturing, energy and beyond; and innovate for the health and well-being of local communities, including through new diagnostics, treatments and vaccines.

To encourage and sustain this transition towards bio-based economies, nations and regions are launching mission-driven initiatives that embrace equitable forms of collaboration, consensus-building and governance to work together across sectoral and geographic boundaries alike. These initiatives demonstrate pragmatism and humility through a focus on understanding which challenges to prioritize, which of these challenges synthetic biology can usefully help address and which it cannot, and the timelines involved.

The tools, technologies and data capabilities emerging from these initiatives are shaped by all members of society for the benefit of all people and the planet.²¹³ This aspiration informs strategy, policy and practice at all levels, including in innovation and regulatory policy as well as investment and benefit-sharing arrangements.

Building these foundations involves recommitments from all people, organizations and nations to safeguard the shared biological future against potential misuse. By protecting against biological threats, society allows peaceful purposes to flourish

and helps to advance towards a world in which everyone is entrusted and empowered to be a biological citizen.

Safeguarding global commons and maximizing cooperation

Bioscience data and technology infrastructures comprise a valuable global commons and foster improved cooperation across borders and sectors. Industry, governments and civil society collectively recognize the increasing power inherent in ownership and control of these biological assets paired with the importance of developing and distributing these assets and capabilities equitably.

New public-private partnerships form to build shared knowledge repositories to enable global synthetic biology efforts. Shared digital sequence data and other knowledge commons help to fuel, shape and responsibly safeguard global synthetic biology efforts. Investments in the technical infrastructure for knowledge sharing are coupled to investments in the social infrastructure that guides and supports its development and use. Education, business development and policy engagement help drive leadership that connects technical, social and policy issues. Such efforts empower millions of new participants in synthetic biology research and technology development, boosting the likelihood that the real potential of global innovation can be harnessed, scaling advances in synthetic biology, decreasing costs and increasing access to biologically-derived products and services.

In this future, cross-border and cross-sector collaborations are open, effective and, wherever possible, transparent. Working across geographies and ideologies, all people recognize that now is the time to collectively guide the trajectory of synthetic biology development to maximize positive impacts and safeguard shared biological futures.

“ The vision for 2025 is that every country has the capacity to build a bio-based circular economy, benefit from record investments and increase sustainability across sectors using synthetic biology.



Pathways for Vision 2025

Embedding key values in bioeconomy strategies

If synthetic biology is to realize its potential to bring social, economic and environmental benefits, bioeconomy strategies and policies must be guided by values supporting and safeguarding all people and the planet. Harnessing the talent needed to respond to global challenges requires revisiting structures for resourcing and recognition.

Strategies for operationalizing this pathway include:

- **Identify global challenges where synthetic biology could contribute to inclusive solutions.** Centring collaborations on specific foci, including the SDGs, climate change and pandemic preparedness, could encourage sharing, comparing and collaborating.

- **Embed design thinking and a plurality of perspectives in bioeconomy strategy development.** Broad and early engagement in strategy and policy development is essential to building values of equity, humility, sustainability and solidarity into the technology.²¹⁴ It is also necessary to develop better metrics for value in innovation ecosystems and amplify under-represented voices in bioeconomy narratives.
- **Develop legal and financial tools that deliver investment to enable vibrant bioeconomies globally.** Financing arrangements that combine public- and private-sector financing to support social enterprises are needed. Risk assessment techniques should incentivize a broad range of projects focusing on pragmatic outcomes. Investment strategies should combine financial returns with measurable social impact.

“ Bioeconomy strategies and policies must be guided by values supporting and safeguarding all people and the planet.



Strengthening all geographies of innovation

To reach the full potential of synthetic biology, the creativity and capability of the global research community must be leveraged, and the benefits of synthetic biology must be delivered globally.

Strategies for operationalizing this pathway include:

- **Recognize and leverage strengths of geographic diversity.** Value is derived from genetic resources and talent sourced worldwide, but innovation is concentrated in limited geographies. Greater benefit can be unlocked if local populations participate in discovery and development. The Global South is under-represented and should be further drawn in both as developer and as beneficiary. Attracting, educating and developing people in developed countries is not enough: local innovation is

essential to providing effective frameworks for solutions and ensuring local benefits.

- **Form equitable partnerships to enable geographic diffusion of synthetic biology.** The products and services that emerge from synthetic biology should be responsive to societal and cultural differences. Partnerships need to be established with all innovation stakeholders, creating enabling conditions for the technology to flourish in both local and global contexts.
- **Increase local autonomy for research and innovation.** Local autonomy requires reduced dependency on foreign funding, increased capacity building and reduced scientific dependency. This can be done by building a qualified workforce and infrastructure, increasing local job prospects and ensuring that enabling technologies are readily available to students, researchers, business executives

and regulatory agencies all over the world. Partnering with organizations like the international Genetically Engineered Machine (iGEM) Competition can engage local communities and connect them with counterparts internationally.

Building knowledge, tools and data commons

The genetic code is a foundational toolset enabling synthetic biology to solve global challenges. These resources, however, are not effectively connected or accessible. Building a shared, global commons of digital sequence information (DSI)²¹⁵ and other resources will improve access and accelerate innovation. Making the knowledge, tools and technologies to leverage DSI available through partnerships, databases and repositories will be critical. Establishing solutions that adhere to FAIR data principles (Findable, Accessible, Interoperable, Reproducible) can enhance equity and the positive impact of DSI, tools and technologies.

Strategies for operationalizing this pathway include:

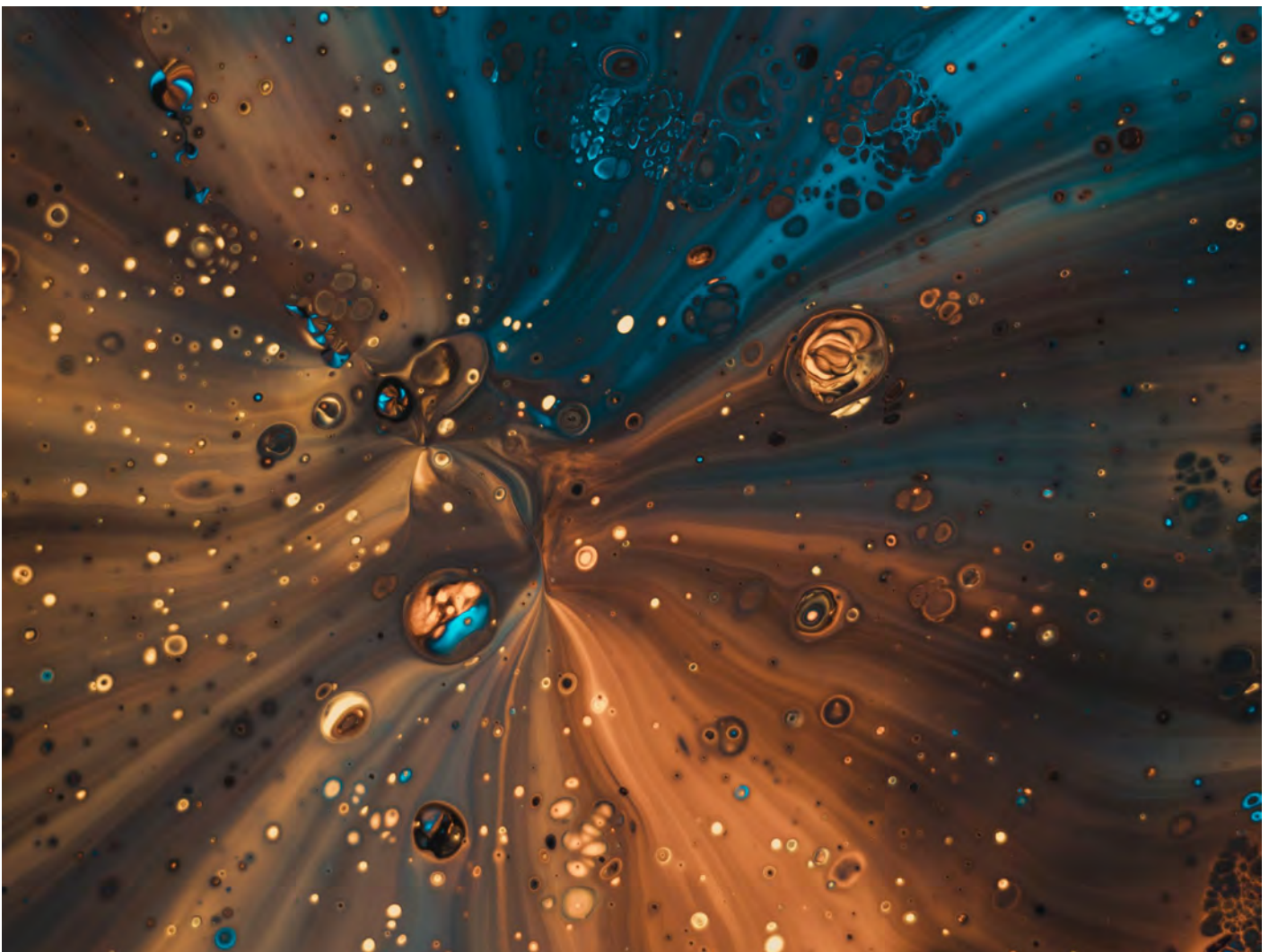
- **Establish a global commons fund.** A global fund devoted to the production and sharing

of DSI and other tools and resources without future restrictions on use will enable innovation. This alleviates the need for complicated tracking mechanisms while ensuring sustainability of the resource and incentives for contributors. Numerous tool and databases already exist; linking these through a central source will deliver benefits to all. The fund should be financed by country members, industry and research communities.

- **Develop a network of regional DSI producing centres.** Part of the fund can establish a centre devoted to sequencing local biodiversity and curating knowledge critical to its use. The investment can extend to establishment of biofoundries for innovation.
- **Enhance biodiversity conservation and build local communities.** Long-term benefits of investment require supporting communities and environments. Focusing regional centres on community development and conservation will enable them to become nucleate points for activities.

These shared commons provide a framework for delivering the values that should be embedded in synthetic biology's development.

“ Building a shared, global commons of digital sequence information and other resources will improve access and accelerate innovation.



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Endnotes

1. World Economic Forum, “Global Future Councils” [website], <https://www.weforum.org/communities/global-future-councils>.
2. See World Economic Forum, Centre for the New Economy and Society, “Building Back Broader: Policy Pathways for an Economic Transformation”, Community Paper, 2021, https://www3.weforum.org/docs/WEF_GFC_NES_Policy_Pathways_for_an_Economic_Transformation_2021.pdf.
3. Ibid.
4. Ibid.
5. Mazzucato, Mariana, *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*, Anthem Press, 2013.
6. Laplane, Andrea, and Mariana Mazzucato, “Socializing the risks and rewards of public investments: Economic, policy, and legal issues”, *Research Policy*, vol. 49, Supplement, 2020, <https://www.sciencedirect.com/science/article/pii/S2590145120300025>.
7. See World Economic Forum, “Building Back Broader: Policy Pathways for an Economic Transformation”, op. cit.
8. Ibid.
9. Ibid.
10. Ibid.
11. Ibid.
12. Ibid.
13. Ibid.
14. Ibid.
15. Farrell, Diana, Raghuram G. Rajan and Guillaume Hingel, “Building back broader: A new approach to fiscal and monetary policy”, World Economic Forum, Agenda, 2 June 2021, <https://www.weforum.org/agenda/2021/06/new-approach-fiscal-and-monetary-policy>.
16. See World Economic Forum, “Building Back Broader: Policy Pathways for an Economic Transformation”, op. cit.
17. Gopinath, Gita, “Managing Divergent Recoveries”, IMF Blog, 6 April 2021, <https://blogs.imf.org/2021/04/06/managing-divergent-recoveries>.
18. Dabla-Norris, Era, et al., “Fiscal Policies to Address Climate Change in Asia and the Pacific”, IMF Departmental Paper No 2021/007, 24 March 2021, <https://www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2021/03/24/Fiscal-Policies-to-Address-Climate-Change-in-Asia-and-the-Pacific-Opportunities-and-49896>.
19. Vivid Economics, *Greenness of Stimulus Index*, 2021, <https://www.vivideconomics.com/wp-content/uploads/2021/02/Greenness-of-Stimulus-Index-5th-Edition-FINAL-VERSION-09.02.21.pdf>.
20. World Bank, Carbon Pricing Dashboard, 2020 update, <https://carbonpricingdashboard.worldbank.org>.
21. Agarwal, Ruchir, and Gita Gopinath, “A Proposal to End the COVID 19 Pandemic”, International Monetary Fund (IMF), Staff Discussion Note No. 2021/004, 2021, <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2021/05/19/A-Proposal-to-End-the-COVID-19-Pandemic-460263>.
22. Rees, Daniel, “What comes next? Recovery from an uneven recession”, Bank for International Settlements, BIS Bulletin 33, 2020, <https://www.bis.org/publ/bisbull33.pdf>.
23. Cobham, Alex, *The Uncounted*, Polity Press, 2020, <https://www.wiley.com/en-us/The+Uncounted-p-9781509536016>.
24. See World Economic Forum, “Building Back Broader: Policy Pathways for an Economic Transformation”, op. cit.
25. Gentilini, Ugo, et al., “Social Protection and Jobs Responses to COVID-19: A Real-Time Review of Country Measures”, “Living paper” version 15, World Bank, 14 May 2021, <https://openknowledge.worldbank.org/handle/10986/33635>.
26. Blanchard, Olivier J., and Lawrence H. Summers, “Automatic Stabilizers in a Low-Rate Environment”, American Economic Association, *AEA Papers and Proceedings*, vol. 110, 2020, pp. 125-30, <https://www.aeaweb.org/articles?id=10.1257/pandp.20201075>.
27. International Labour Organization (ILO), *World Social Protection Report 2020-22*, 2021, https://ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/@publ/documents/publication/wcms_817572.pdf.
28. Bowen, Thomas, et al., *Adaptive Social Protection: Building Resilience to Shocks*, World Bank, 2020, <https://openknowledge.worldbank.org/handle/10986/33785>.
29. International Monetary Fund (IMF), *Fiscal Monitor: A Fair Shot*, April 2021, <https://www.imf.org/en/Publications/FM/Issues/2021/03/29/fiscal-monitor-april-2021#Full%20Report>.
30. UNICEF, “Schoolchildren worldwide have lost 1.8 trillion hours and counting of in-person learning due to COVID-19 lockdowns, says UNICEF”, Press Release, 16 September 2021, <https://www.unicef.org/cuba/en/press-releases/schoolchildren-worldwide-have-lost-18-trillion-hours-and-counting-person-learning>.

31. International Monetary Fund (IMF), *Fiscal Monitor: A Fair Shot*, op cit.
32. Ibid.
33. World Economic Forum, *The Future of Jobs Report 2020*, Executive Summary, 20 October 2020, <https://www.weforum.org/reports/the-future-of-jobs-report-2020/in-full/executive-summary#executive-summary>.
34. Dabla-Norris, et al., "Fiscal Policies to Address Climate Change in Asia and the Pacific", op. cit.
35. International Monetary Fund (IMF), *World Economic Outlook: Recovery During a Pandemic*, 2021, <https://www.imf.org/en/Publications/WEO/Issues/2021/10/12/world-economic-outlook-october-2021>.
36. Parry, Ian, Simon Black and James Roaf, "Proposal for an International Carbon Price Floor Among Large Emitters", International Monetary Fund, Staff Climate Note 2021/001, 2021, <https://www.imf.org/en/Publications/staff-climate-notes/Issues/2021/06/15/Proposal-for-an-International-Carbon-Price-Floor-Among-Large-Emitters-460468>.
37. Kindermann, Fabian, and Dirk Krueger, "High Marginal Tax Rates on the Top 1%? Lessons from a Life Cycle Model with Idiosyncratic Income Risk", *American Economic Journal: Macroeconomics*, 2021, <https://epub.uni-regensburg.de/44533>.
38. Inchauste, Gabriela, and Nora Lustig, *The Distributional Impact of Taxes and Transfers: Evidence From Eight Developing Countries*, World Bank, 2017, <https://openknowledge.worldbank.org/handle/10986/27980>.
39. Cobham, Alex, "Is today a turning point against corporate tax abuse?", Tax Justice Network, 4 June 2021, <https://taxjustice.net/2021/06/04/is-today-a-turning-point-against-corporate-tax-abuse>.
40. Godar, Sarah, "The state of tax justice 2021: Report by the Global Alliance for Tax Justice, Public Services International, and the Tax Justice Network published online in November 2021", EU Tax Observatory, 16 December 2021, <https://www.taxobservatory.eu/repository/the-state-of-tax-justice-2021/#:~:text=TJN%20estimates%20that%20the%20world,99.4%25%20of%20corporate%20tax%20losses>.
41. Giles, Chris, "IMF proposes 'solidarity' tax on pandemic winners and wealthy", *Financial Times*, 7 April 2021, <https://www.ft.com/content/5dad2390-8a32-4908-8c96-6d23cd037c38>.
42. CFA Institute, *Future of Sustainability in Investment Management: From Ideas to Reality*, 2020, <https://www.cfainstitute.org/-/media/documents/survey/future-of-sustainability.pdf>.
43. Hewett, Jennifer, "Boards suffer an 'identity crisis' as ESG demands rise", *Australian Financial Review*, 6 September 2021, <https://www.afr.com/policy/economy/boards-suffer-an-identity-crisis-as-esg-demands-rise-20210906-p58p73>.
44. United Nations Conference on Trade and Development (UNCTAD), "Sustainable finance surges despite volatile markets during COVID-19, says UN report", Press Release, 21 June 2021, <https://unctad.org/press-material/sustainable-finance-surges-despite-volatile-markets-during-covid-19-says-un-report>.
45. Segal, Mark, "PRI Reaches 4,000 Signatories as Interest in ESG Investing Proliferates Across Sectors and Regions", ESG Today, 14 June 2021, <https://www.esgtoday.com/pri-reaches-4000-signatories-as-interest-in-esg-investing-proliferates-across-sectors-and-regions>.
46. International Consumer Protection and Enforcement Network (ICPEN), "Screening of websites for 'greenwashing': half of green claims lack evidence" News, 29 January 2021, <https://icpen.org/news/1146>.
47. Schroders, "Schroders Institutional Investor Study 2020: Active engagement identified as key tactic for driving change as greenwashing becomes main challenge", 29 October 2020, https://www.schroders.com/en/media-relations/newsroom/all_news_releases/schroders-institutional-investor-study-2020-active-engagement-identified-as-key-tactic-for-driving-change-as-greenwashing-becomes-main-challenge.
48. United Nations Conference on Trade and Development (UNCTAD), *World Investment Report 2021: Investing in Sustainable Recovery*, 2021, https://unctad.org/system/files/official-document/wir2021_en.pdf.
49. Weinberg, Andrew, "What to do about the shift from public to private markets", World Economic Forum, Agenda, 29 April 2021, <https://www.weforum.org/agenda/2021/04/what-to-do-about-the-shift-from-public-to-private-markets>.
50. PwC, "Private markets forecast to grow to \$4.9tn globally by 2025 and make up 10% of global AuM", Press Release, 13 January 2021, <https://www.pwc.com/gx/en/news-room/press-releases/2021/prime-time-private-markets.html>.
51. Lu, Kevin, and Hongyi Shen, "Here's how to choose the right fund manager for the future", World Economic Forum, Agenda, 18 January 2022, <https://www.weforum.org/agenda/2022/01/choose-right-fund-manager-future>.
52. Principles for Responsible Investment (PRI), "Stewardship", 19 February 2021, <https://www.unpri.org/an-introduction-to-responsible-investment/an-introduction-to-responsible-investment-stewardship/7228.article>.
53. World Economic Forum, "Measuring Stakeholder Capitalism: Towards Common Metrics and Consistent Reporting of Sustainable Value Creation", <https://www.weforum.org/stakeholdercapitalism>.
54. Lerner, Josh, "3 lessons for financing forest conservation", World Economic Forum, Agenda, 2 December 2021, <https://www.weforum.org/agenda/2021/12/3-lessons-for-financing-forest-conservation>.
55. Hodgson, Tim, "Valuing natural capital is key to the future of investment. Here's why", World Economic Forum, Agenda, 4 August 2021, <https://www.weforum.org/agenda/2021/08/natural-capital-key-future-investment>.
56. Williamson, Sarah, "Sustainability metrics: why it's time investors look in the mirror", World Economic Forum, Agenda, 1 October 2021, <https://www.weforum.org/agenda/2021/10/sustainability-stakeholder-metrics-for-investors>.
57. World Economic Forum in collaboration with FCLTGlobal, "Adapting Corporate Sustainable Value Creation Indicators for Investors", Community Paper, 2021, https://www3.weforum.org/docs/WEF_ESG_disclosure_for_asset_owners_2021.pdf.

58. Dunsire, Fiona, Stefan Dunatov and Suni Harford, "Why private companies need to catch up on sustainability", World Economic Forum, Agenda, 7 April 2022, <https://www.weforum.org/agenda/2022/04/why-private-companies-need-to-catch-up-on-sustainability>.
59. Weinberg, Andrew, "Why private-market investors need to accelerate their push for diversity", World Economic Forum, Agenda, 15 July 2021, <https://www.weforum.org/agenda/2021/07/private-markets-moment-for-diversity-equity-and-inclusion>.
60. CFA Institute, *Future of Sustainability in Investment Management: From Ideas to Reality*, op. cit.
61. Andrews, Meagan, "How to address sustainable investment backlash and improve ESG reporting", World Economic Forum, Agenda, 21 December 2021, <https://www.weforum.org/agenda/2021/12/esg-sustainable-investment-backlash>.
62. Ibid.
63. This section is based on World Economic Forum, "Global Future Council on Responsive Financial Systems: Three ways to accelerate a digital-led recovery", White Paper, 2021, https://www3.weforum.org/docs/WEF_GFC_Three_ways_to_accelerate_a_digital_led_recovery_2021.pdf.
64. Carney, Marc, "Fifty Shades of Green", International Monetary Fund, *Finance & Development*, vol. 56, no. 4, December 2019, <https://www.imf.org/external/pubs/ft/fandd/2019/12/a-new-sustainable-financial-system-to-stop-climate-change-carney.htm>.
65. van Steenis, Huw, "A new phase for green investing", *Financial Times*, 17 November 2021, <https://www.ft.com/content/c2937d7b-98f1-4179-823c-4a58e21f8e30>.
66. van Steenis, Huw, and Alice Law Shing-Mui, "3 ways to accelerate a digital-led recovery", World Economic Forum in collaboration with *Forbes*, Global Agenda, 1 November 2021, https://www.weforum.org/global_future_councils/gfc-on-responsive-financial-systems/articles/3-ways-to-accelerate-a-digital-led-recovery.
67. van Steenis, "A new phase for green investing", op. cit.
68. African Development Bank Group, "MDBs' climate finance rose to \$66 billion in 2020, joint report shows", 30 June 2021, <https://www.afdb.org/en/news-and-events/press-releases/mdb-climate-finance-rose-66-billion-2020-joint-report-shows-44420>.
69. World Economic Forum, "Building Back Broader: Policy Pathways for an Economic Transformation", op. cit.
70. Dolan, Paul, et al., *MINDSPACE: Influencing behaviour through public policy*, UK Institute for Government, the Cabinet Office, 2010, <https://www.instituteforgovernment.org.uk/sites/default/files/publications/MINDSPACE.pdf>.
71. United Nations Conference on Trade and Development (UNCTAD), "Trade data for 2020 confirm growing importance of digital technologies during COVID-19", 27 October 2021, <https://unctad.org/news/trade-data-2020-confirm-growing-importance-digital-technologies-during-covid-19>.
72. Ipsos, "World Opinion on Globalization and International Trade in 2021: Ipsos Global Advisor 25-Country Survey for the World Economic Forum", 2021, <https://www.ipsos.com/sites/default/files/ct/news/documents/2021-08/World%20Opinion%20on%20Globalization%20and%20International%20Trade%20in%202021%20-%20Report.pdf>.
73. Naas, Penelope, Pamela Coke-Hamilton and Nisha Taneja, "5 ways trade can support a gender-equal recovery", World Economic Forum, Agenda, 6 December 2021, <https://www.weforum.org/agenda/2021/12/5-ways-trade-can-support-gender-equal-recovery>.
74. Johnson, Stephen, "Corruption is costing the global economy \$3.6 trillion dollars every year", World Economic Forum, Agenda, 13 December 2018, <https://www.weforum.org/agenda/2018/12/the-global-economy-loses-3-6-trillion-to-corruption-each-year-says-u-n>.
75. 75 Based on World Economic Forum, "The Role and Responsibilities of Gatekeepers in the Fight against Illicit Financial Flows: A Unifying Framework", 2021, https://www3.weforum.org/docs/WEF_Gatekeepers_A_Unifying_Framework_2021.pdf; see also, International Monetary Fund (IMF), "Corruption: Costs and Mitigating Strategies", IMF Staff Discussion Note, 2016, <https://www.imf.org/external/pubs/ft/sdn/2016/sdn1605.pdf>.
76. World Economic Forum, "The Rise and Role of the Chief Integrity Officer: Leadership Imperatives in an ESG-Driven World", White Paper, 2021, https://www3.weforum.org/docs/WEF_The_Rise_and_Role_of_the_Chief_Integrity_Officer_2021.pdf.
77. See World Economic Forum, "The Role and Responsibilities of Gatekeepers in the Fight against Illicit Financial Flows: A Unifying Framework", 2021.
78. World Economic Forum, "The Role and Responsibilities of Gatekeepers in the Fight against Illicit Financial Flows: A Unifying Framework", 18 June 2021, https://www3.weforum.org/docs/WEF_Gatekeepers_endorsement_list_2021.pdf.
79. United Nations Office on Drugs and Crime and World Bank, "Stolen Asset Recovery Initiative (StAR)", <https://star.worldbank.org>.
80. See World Economic Forum, Global Future Council on Transparency and Anti-Corruption, "Hacking corruption in the digital era: How tech is shaping the future of integrity in times of crisis", Agenda for Business Integrity, 2020, https://www3.weforum.org/docs/WEF_GFC_on_Transparency_and_AC_Agenda_for_Business_Integrity_pillar_3_2020.pdf.
81. UN Environment Programme, "International Day of Clean Air for blue skies underlines link between healthy air and a healthy planet", 23 June 2021, <https://www.unep.org/news-and-stories/story/international-day-clean-air-blue-skies-underlines-link-between-healthy-air>.

82. World Health Organization, "Ambient (outdoor) air pollution: Key facts", 22 September 2021, [https://www.who.int/news-room/fact-sheets/detail/ambient-\(outdoor\)-air-quality-and-health](https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health).
83. International Energy Agency (IEA), *World Energy Outlook 2021*, 2021, <https://iea.blob.core.windows.net/assets/888004cf-1a38-4716-9e0c-3b0e3fdbf609/WorldEnergyOutlook2021.pdf>.
84. Climate Watch, "World Greenhouse Gas Emissions in 2018 by Sector, End Use and Gases", World Resources Institute, 2018, <https://www.climatewatchdata.org/key-visualizations?visualization=5>.
85. Ibid.
86. Roelofsen, Occo, et al., "Plugging in: What electrification can do for industry", McKinsey & Company, 28 May 2020, <https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/plugging-in-what-electrification-can-do-for-industry>.
87. Climate Watch, "World Greenhouse Gas Emissions in 2018 by Sector, End Use and Gases", op. cit.
88. Ibid.
89. International Energy Agency, *World Energy Outlook 2021*, op. cit.
90. Ibid.
91. World Economic Forum, *Getting to Net Zero: Increasing Clean Electrification by Empowering Demand*, Insight Report, 2021, https://www3.weforum.org/docs/WEF_Increasing_Clean_Electrification_by_Empowering_Demand_2021.pdf.
92. International Energy Agency, *World Energy Outlook 2021*, op. cit.
93. Adler, Kevin, "Global CO2 emissions to rise by 4.9% in 2021: Global Carbon Project", IHS Markit, 4 November 2021, <https://cleanenergynews.ihsmarkit.com/research-analysis/global-co2-emissions-to-rise-by-49-in-2021-global-carbon-proje.html>.
94. Haselip, J. A. (Ed.), *Scaling up investment in climate technologies: Pathways to realising technology development and transfer in support of the Paris Agreement*, UNEP DTU Partnership, 2021, https://backend.orbit.dtu.dk/ws/files/263889473/2021_10_Perspectives_Scaling_up_investments_WEB_3.pdf.
95. Ibid.
96. See World Economic Forum, "Net-Zero Equity: Mobilizing Capital to Fight Climate Change", Briefing Paper, 2021, https://www3.weforum.org/docs/WEF_Net_Zero_Equity_Mobilizing_Capital_to_Fight_Climate_Change_2021.pdf.
97. World Economic Forum in collaboration with BloombergNEF and Deutsche Energie-Agentur (dena), "Harnessing Artificial Intelligence to Accelerate the Energy Transition", White Paper, 2021, https://www3.weforum.org/docs/WEF_Harnessing_AI_to_accelerate_the_Energy_Transition_2021.pdf.
98. Bond, Kingsmill, et al., "Emerging markets adopt renewables", IndiaWaterPortal, 19 July 2021, <https://www.indiawaterportal.org/articles/emerging-markets-adopt-renewables>.
99. Carbon Tracker, "Reach for the Sun: The emerging market electricity leapfrog", 14 July 2021, <https://carbontracker.org/reports/reach-for-the-sun>.
100. Saraiva, Joisa, and Victor, David G., "Rethinking global supply chains for the energy transition", World Economic Forum, Agenda 2022, 31 January 2022, https://www.weforum.org/global_future_councils/gfc-on-energy-transition/articles/rethinking-supply-chains-for-the-energy-transition.
101. US Department of State, "The Clean Energy Demand initiative (CEDI), Fact Sheet", 4 November 2021, <https://www.state.gov/the-clean-energy-demand-initiative-cedi/#:~:text=CEDI%20creates%20a%20platform%20to,retail%2C%20technology%2C%20and%20transportation>.
102. See First Movers Coalition [website], <https://www.weforum.org/first-movers-coalition>.
103. World Economic Forum, "New Nature Economy Report Series", 14 July 2020, <https://www.weforum.org/reports/new-nature-economy-report-series>.
104. Ellsmoor, James, "Global Population Without Access To Electricity Drops By 400 Million Since 2010", *Forbes*, 23 May 2019, <https://www.forbes.com/sites/jamesellsmoor/2019/05/23/sdg-7-at-current-rate-2030-renewable-energy-goals-will-be-missed>.
105. See World Economic Forum, "Scaling Investments in Nature: The Next Critical Frontier for Private Sector Leadership", White Paper, 2022, https://www3.weforum.org/docs/WEF_Scaling_Investments_in_Nature_2022.pdf.
106. Ibid.
107. Earth Overshoot Day, "About Earth Overshoot Day", <https://www.overshootday.org/about-earth-overshoot-day>.
108. Sena, Kanyinke, "Recognizing Indigenous Peoples' Land Interests Is Critical for People and Nature", World Wildlife Fund, 22 October 2020, <https://www.worldwildlife.org/stories/recognizing-indigenous-peoples-land-interests-is-critical-for-people-and-nature#:~:text=By%20fighting%20for%20their%20lands,they%20have%20lived%20for%20centuries>.
109. Farand, Chloé, "UN summit highlights \$700bn funding gap to restore nature", Climate Home News, 28 September 2020, <https://www.climatechangenews.com/2020/09/28/un-summit-highlights-700bn-funding-gap-restore-nature/#:~:text=Countries%20need%20to%20find%20a%2024700,restoration%20of%20nature%20on%20Monday>.
110. Lai, Olivia, "90% of Global Farm Subsidy Payments Harming Public Health and Climate, Says UN", Earth. Org, 15 September 2021, [https://earth.org/global-farm-subsidy-payments-are-harming-public-health-and-climate/#:~:text=Nearly%2090%25%20of%20the%20world's,UN%20Environment%20Programme%20\(UNEP\)](https://earth.org/global-farm-subsidy-payments-are-harming-public-health-and-climate/#:~:text=Nearly%2090%25%20of%20the%20world's,UN%20Environment%20Programme%20(UNEP)).

111. United Kingdom Government, "World leaders summit on 'Action on forests and land use'", Policy paper, 21 January 2022 update, <https://www.gov.uk/government/publications/cop26-world-leaders-summit-on-action-on-forests-and-land-use-2-november-2021/world-leaders-summit-on-action-on-forests-and-land-use>.
112. See World Economic Forum in collaboration with PwC, "Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy", New Nature Economy series, 2020, https://www3.weforum.org/docs/WEF_New_Nature_Economy_Report_2020.pdf.
113. Morgan Stanley Capital International, *MSCI Emerging Markets ESG Leaders Index*, 28 February 2022, <https://www.msci.com/documents/10199/c341baf6-e515-4015-af5e-c1d864cae53e>.
114. Cone Communications, "2016 Cone Communications Millennial Employee Engagement Study", 2016, <https://www.conecomm.com/research-blog/2016-millennial-employee-engagement-study>.
115. See World Economic Forum, "Scaling Investments in Nature: The Next Critical Frontier for Private Sector Leadership", op. cit.
116. Curtis, Philip G., et al., "Classifying drivers of global forest loss", *Science*, vol. 361, no. 6407, 14 September 2018, pp. 1108-1111, <https://www.science.org/doi/10.1126/science.aau3445>.
117. Forest and Finance, "Financial Flows and Policy Assessments Key Findings", 8 November 2021, <https://forestsandfinance.org/news/financial-flows-and-policy-assessments-key-findings>.
118. See World Economic Forum, "Scaling Investments in Nature: The Next Critical Frontier for Private Sector Leadership", op. cit.
119. FAO, UNDP and UNEP, *A multi-billion-dollar opportunity – Repurposing agricultural support to transform food systems*, 2021, <https://www.fao.org/documents/card/en/c/cb6562en>.
120. See World Economic Forum, "Scaling Investments in Nature: The Next Critical Frontier for Private Sector Leadership", op. cit.
121. Ibid.
122. Ibid.
123. Science Based Targets, "More than 1,000 companies commit to science-based emissions reductions in line with 1.5°C climate ambition", Press Release, 10 November 2021, <https://sciencebasedtargets.org/news/more-than-1000-companies-commit-to-science-based-emissions-reductions-in-line-with-1-5-c-climate-ambition>.
124. International Energy Agency (IEA), *Net Zero by 2050*, 2021, <https://www.iea.org/reports/net-zero-by-2050>.
125. Hopley, Anthony Robert, Johanna Lehne and Rob van Riet, "How to deliver on climate pledges? Look at these industries transitioning to net zero", World Economic Forum, Agenda, 17 January 2022, <https://www.weforum.org/agenda/2022/01/net-zero-industrial-transition-climate-action>.
126. See World Economic Forum in collaboration with Boston Consulting Group, *Net-Zero Challenge: The supply chain opportunity*, Insight Report, 2021, https://www3.weforum.org/docs/WEF_Net_Zero_Challenge_The_Supply_Chain_Opportunity_2021.pdf.
127. Hopley, Lehne and van Riet, "How to deliver on climate pledges? Look at these industries transitioning to net zero", op. cit.
128. UNDP, SDG Investor Platform, "Gender Equality Isn't Just A Number's Game", 8 March 2022, <https://sdginvestorplatform.undp.org/news/gender-equality-isnt-just-numbers-game>.
129. Organisation for Economic Co-operation and Development (OECD), "Global Outlook on Financing for Sustainable Development 2021 – A New Way to Invest for people and Planet", 9 November 2020, <https://www.oecd.org/publications/global-outlook-on-financing-for-sustainable-development-2021-e3c30a9a-en.htm>.
130. Kumar, Manmohan. S., et al., "Investing in Emerging and Frontier Economies: How Blended Finance can make the most of public funding", ILN Position Paper for COP26 and G20, in collaboration with The Rockefeller Foundation, 2021, https://investorleadershipnetwork.org/wp-content/uploads/ILN_2021_InvestingInEmergingFrontierEconomies_Report_v4.pdf.
131. Robins, Nick, Vonda Brunsting and David Wood, "Climate change and the just transition: A guide for investor action", Grantham Research Institute on Climate Change and the Environment, 2018, <https://iri.hks.harvard.edu/files/iri/files/jtguidanceforinvestors.pdf?m=1554219326>.
132. See UN-convened Net Zero Asset Owner Alliance, "Scaling Blended Finance", Discussion Paper, 2021, <https://www.greenfinanceplatform.org/guidance/scaling-blended-finance-un-convened-net-zero-asset-owner-alliance-discussion-paper>.
133. See World Economic Forum, "Reshaping Risk Mitigation: The Impact of Non-financial Levers", White Paper, 2021, https://www3.weforum.org/docs/WEF_Reshaping_Risk_Mitigation_2021.pdf.
134. United Nations World Tourism Organization (UNWTO), "International Tourism Growth Continues to Outpace the Global Economy", 20 January 2020, <https://www.unwto.org/international-tourism-growth-continues-to-outpace-the-economy>.
135. Addamo, Anna M., et al., *EU Blue Economy Report 2021*, European Commission, 2021, https://ec.europa.eu/oceans-and-fisheries/system/files/2021-05/the-eu-blue-economy-report-2021_en.pdf.
136. World Travel & Tourism Council (WTTC), *A Net Zero Roadmap for Travel & Tourism: Proposing a new Target Framework for the Travel & Tourism Sector*, 2021, https://wttc.org/Portals/0/Documents/Reports/2021/WTTC_Net_Zero_Roadmap.pdf.

137. An example of such efforts is provided by the Global Sustainable Tourism Council (see GSTC, “Criteria Overview”, <https://www.gstcouncil.org/gstc-criteria>) and by the Future of Tourism Coalition (see “About the Future of Tourism Coalition”, <https://www.futureoftourism.org/about-us>).
138. The cases provided by Tourism Declares (see “Tourism Declares a Climate Emergency”, <https://www.tourismdeclares.com>) and the World Travel & Tourism Council’s latest report on net zero (WTTC, *A Net Zero Roadmap for Travel & Tourism: Proposing a new Target Framework for the Travel & Tourism Sector*, 2021, https://wttc.org/Portals/0/Documents/Reports/2021/WTTC_Net_Zero_Roadmap.pdf) provide useful references.
139. See European Commission, “Sustainable blue economy: A new approach for a sustainable blue economy in the EU” (https://ec.europa.eu/oceans-and-fisheries/ocean/blue-economy/sustainable-blue-economy_en), which provides an example of how natural resources should be employed to mitigate climate change, in a circular way, to benefit the tourism industry.
140. Ibid.
141. World Economic Forum, *The Future of Jobs Report 2020*, 2020, https://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf.
142. World Economic Forum in collaboration with PwC, *Upskilling for Shared Prosperity*, Insight Report, 2021, https://www3.weforum.org/docs/WEF_Upskilling_for_Shared_Prosperty_2021.pdf.
143. See World Economic Forum, “Building Back Broader: Policy Pathways for an Economic Transformation”, op. cit.
144. Samek, Manuela, et al., *The effectiveness and costs-benefits of apprenticeships: Results of the quantitative analysis*, European Commission, 2013, <https://www.employment-studies.co.uk/resource/effectiveness-and-costs-benefits-apprenticeships-results-quantitative-analysis>.
145. See World Economic Forum, “Building Back Broader: Policy Pathways for an Economic Transformation”, op. cit.
146. Ibid.
147. Ibid.
148. Ellyatt, Holly, “There are millions of jobs, but a shortage of workers: Economists explain why that’s worrying”, CNBC, 20 October 2021 update, <https://www.cnbc.com/amp/2021/10/20/global-shortage-of-workers-whats-going-on-experts-explain.html>.
149. See World Economic Forum, “Building Back Broader: Policy Pathways for an Economic Transformation”, op. cit.
150. Ibid.
151. Zurich, “Zurich sees leap in women applying for senior roles after offering all jobs as flexible”, Press Release, 17 November 2020, <https://www.zurich.co.uk/media-centre/zurich-sees-leap-in-women-applying-for-senior-roles-after-offering-all-jobs-as-flexible>.
152. See World Economic Forum, “Building Back Broader: Policy Pathways for an Economic Transformation”, op. cit.
153. Ibid.
154. United Nations, “Rising inequality affecting more than two-thirds of the globe, but it’s not inevitable: new UN report”, UN News, 21 January 2020, <https://news.un.org/en/story/2020/01/1055681>.
155. See World Economic Forum, “Global Future Council on Mental Health”, <https://cn.weforum.org/communities/gfc-on-mental-health>.
156. Carvajal-Velez, Liliana, et al., “Increasing Data and Understanding of Adolescent Mental Health Worldwide: UNICEF’s Measurement of Mental Health Among Adolescents at the Population Level Initiative”, *Journal of Adolescent Health*, 2021, <https://rest.neptune-prod.its.unimelb.edu.au/server/api/core/bitstreams/ffb93764-f2df-5de9-b4d4-43744bbde63d/content>.
157. Azzopardi, Peter, et al., “Bringing a Wider Lens to Adolescent Mental Health: Aligning Measurement Frameworks With Multisectoral Actions”, *Journal of Adolescent Health*, 2021, <https://rest.neptune-prod.its.unimelb.edu.au/server/api/core/bitstreams/8af69190-6c15-5615-9da3-aad7a10ef420/content>.
158. See World Economic Forum in collaboration with Deloitte, “Global Governance Toolkit for Digital Mental Health: Building Trust in Disruptive Technology for Mental Health”, White Paper, 2021, <https://www.weforum.org/whitepapers/global-governance-toolkit-for-digital-mental-health>.
159. United Nations Children’s Fund (UNICEF), *Prospects for children in 2022: A global outlook*, 2022, <https://www.unicef.org/globalinsight/media/2471/file/UNICEF-Global-Insight-Prospects-for-Children-Global-Outlook-2022.pdf>.
160. Figures are estimates from the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA) Global Humanitarian Overview 2022: <https://gho.unocha.org>.
161. UNICEF estimates that 89% of all humanitarian funding goes to humanitarian needs, reducing the capacity and resources available for development aid projects; see UNICEF, “The Humanitarian-Development nexus”, <https://www.unicef.org/eu/humanitarian-development-nexus>.
162. Guay, Joseph, and Lisa Rudnick, “What the Digital Geneva Convention means for the future of humanitarian action”, UNHCR, 25 June 2017, <https://www.unhcr.org/innovation/digital-geneva-convention-mean-future-humanitarian-action>.
163. United Nations Office for the Coordination of Humanitarian Affairs (OCHA), “The Humanitarian Implications of Cyber Threats”, Virtual Session, 10 December 2021, <https://www.unocha.org/sites/unocha/files/2021%20GHPF%20-%20Concept%20Note%20-%20Cyberthreats%20Panel%20-%20208%20December.pdf>.

164. Figures are estimates from World Bank *Global Economic Prospects*; see, also, World Bank, “People Peace Prosperity”, Brief, 2 October 2020, <https://www.worldbank.org/en/topic/fragilityconflictviolence/brief/people-peace-prosperity>.
165. World Economic Forum, Global Future Council on the New Agenda for Fragility and Resilience, “Guidelines for complementary action in fragile contexts”, https://www3.weforum.org/docs/WEF_Guidelines_for_complementary_action_in_fragile_contexts.pdf.
166. Inter-Agency Standing Committee (IASC), “The Grand Bargain (Official website)”, <https://interagencystandingcommittee.org/grand-bargain>.
167. Inter-Agency Standing Committee (IASC), “Greater Transparency”, OCHA, <https://interagencystandingcommittee.org/greater-transparency>.
168. Inter-Agency Standing Committee (IASC), “A participation revolution: include people receiving aid in making the decisions which affect their lives”, OCHA, <https://interagencystandingcommittee.org/a-participation-revolution-include-people-receiving-aid-in-making-the-decisions-which-affect-their-lives>.
169. Inter-Agency Standing Committee (IASC), “More support and funding tools for local and national responders”, OCHA, <https://interagencystandingcommittee.org/more-support-and-funding-tools-for-local-and-national-responders>.
170. Principles for Digital Development [website], <https://digitalprinciples.org>.
171. International Labour Organization (ILO), “Guidelines for a just transition towards environmentally sustainable economies and societies for all”, 2015, https://www.ilo.org/wcmsp5/groups/public/@ed_emp/@emp_ent/documents/publication/wcms_432859.pdf.
172. International Labour Organization (ILO), “Social dialogue: What is social dialogue?”, <https://www.ilo.org/ifpdial/areas-of-work/social-dialogue/lang--en/index.htm%20%20a>.
173. International Labour Organization (ILO), “ILO downgrades labour market recovery forecast for 2022”, News, 17 January 2022, https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_834117/lang--en/index.htm.
174. See World Economic Forum, “Building Back Broader: Policy Pathways for an Economic Transformation”, op. cit.
175. International Labour Organization (ILO), *World Employment and Social Outlook 2018: Greening with Jobs*, 2018, <https://www.ilo.org/global/research/global-reports/weso/greening-with-jobs/lang--en/index.htm>.
176. See World Economic Forum, “Building Back Broader: Policy Pathways for an Economic Transformation”, op. cit.
177. World Economic Forum, *The Future of Jobs Report 2020*, op. cit.
178. See World Economic Forum, “Building Back Broader: Policy Pathways for an Economic Transformation”, op. cit.
179. World Economic Forum, *The Future of Jobs Report 2020*, op. cit.
180. See World Economic Forum, “Building Back Broader: Policy Pathways for an Economic Transformation”, op. cit.
181. International Labour Organization (ILO), *Global Wage Report 2020-21*, 2020, <https://www.ilo.org/global/research/global-reports/global-wage-report/2020/lang--en/index.htm>.
182. Betcherman, Gordon, “The challenges of regulating the labor market in developing countries”, World Bank, 26 August 2021, <https://blogs.worldbank.org/jobs/challenges-regulating-labor-market-developing-countries>.
183. Cengiz, Doruk, et al., “The Effect of Minimum Wages on Low-Wage Jobs”, *The Quarterly Journal of Economics*, vol. 134, no. 3, 2019, pp. 1405-1454, <https://academic.oup.com/qje/article/134/3/1405/5484905>; Ahlfeldt, Gabriel, Duncan Roth and Tobias Seidel, “The regional effects of Germany’s national minimum wage”, *Economics Letters*, vol. 172, no. C, 2018, pp. 127-130, https://econpapers.repec.org/article/eeeecole/v_3a172_3ay_3a2018_3ai_3ac_3ap_3a127-130.htm.
184. See World Economic Forum, “Building Back Broader: Policy Pathways for an Economic Transformation”, op. cit.
185. Ibid.
186. Ibid.
187. World Economic Forum in collaboration with Willis Towers Watson, “Human Capital as an Asset”, 2020, https://www3.weforum.org/docs/WEF_NES_HR4.0_Accounting_2020.pdf.
188. International Labour Organization, *Global Wage Report 2020-21*, op. cit.
189. See World Economic Forum, “Building Back Broader: Policy Pathways for an Economic Transformation”, op. cit.
190. Ritchie, Hannah, and Max Roser, “CO₂ and Greenhouse Gas Emissions by sector”, Published online at OurWorldInData.org, 2020, <https://ourworldindata.org/emissions-by-sector#energy-electricity-heat-and-transport-73-2>.
191. World Bank, “Manufacturing, value added (% of GDP)”, 2020, <https://data.worldbank.org/indicator/NV.IND.MANF.ZS>.
192. World Economic Forum, “Unlocking Business Model Innovation through Advanced Manufacturing”, White Paper, 2022, https://www3.weforum.org/docs/WEF_Unlocking_Business_Model_Innovation_through_Advanced_Manufacturing_2022.pdf.
193. World Economic Forum, “New Business Models enabled by Advanced Manufacturing”, <https://www.weforum.org/projects/new-business-models-enabled-by-advanced-manufacturing>.
194. World Economic Forum in collaboration with Kearney, “Charting the Course for Global Value Chain Resilience”, White Paper, 2022, https://www3.weforum.org/docs/WEF_Charting_the_Course_for_Global_Value_Chain_Resilience_2022.pdf.
195. World Economic Forum in collaboration with Kearney, “The Resiliency Compass: Navigating Global Value Chain Disruption in an Age of Uncertainty”, White Paper, 2021, https://www3.weforum.org/docs/WEF_Navigating_Global_Value_Chains_Disruptions_2021.pdf.
196. World Economic Forum, “Global Lighthouse Network”, https://www.weforum.org/projects/global_lighthouse_network.

197. World Economic Forum, "Global Smart Industry Readiness Index Initiative", <https://www.weforum.org/projects/global-smart-industry-readiness-index-initiative>.
198. World Economic Forum, "New Generation Industry Leaders", <https://www.weforum.org/projects/new-generation-manufacturing-leaders>.
199. World Economic Forum, "Augmented Workforce Initiative", <https://www.weforum.org/projects/augmented-workforce-initiative>.
200. World Economic Forum, "Unlocking Value in Manufacturing through Data Sharing", Projects, <https://www.weforum.org/projects/data-sharing-for-manufacturing>.
201. World Economic Forum in collaboration with Boston Consulting Group, "Data Excellence: Transforming manufacturing and supply systems", White Paper, 2021, https://www3.weforum.org/docs/WEF_Data_Excellence_Transforming_manufacturing_2021.pdf.
202. World Economic Forum, "Unlocking Value in Manufacturing through Data Sharing", <https://www.weforum.org/projects/data-sharing-for-manufacturing>.
203. Apolitical, "Agile 50: the World's 50 Most Influential People Revolutionising Governance", <https://apolitical.co/list/en/agile-50>.
204. Srivastava, Arun, Nina Moffatt and Konstantin Burkov, "U.K. FinTech and Financial Services – Bitcoin to the Scalebox; the U.K. Government Announces Plans to Boost the FinTech Sector and to Develop a Digital Pound", Paul Hastings, 29 April 2021, <https://www.paulhastings.com/insights/client-alerts/u-k-fintech-and-financial-services-bitcoin-to-the-scalebox-the-u-k>.
205. UK government, "Agile Nations", <https://www.gov.uk/government/groups/agile-nations>.
206. World Economic Forum, "A Holistic Guide to Approaching AI Fairness Education in Organizations", White Paper, 2021, https://www3.weforum.org/docs/WEF_A_Holistic_Guide_to_Approaching_AI_Fairness_Education_in_Organizations_2021.pdf.
207. Hall, Stefan, and Cathy Li, "The Technologies That Could Make Up the Metaverse", BRINK News, 1 November 2021, <https://www.brinknews.com/what-is-the-metaverse>.
208. World Economic Forum, "Global Coalition for Digital Safety", <https://www.weforum.org/global-coalition-for-digital-safety/about>.
209. See World Economic Forum, "In-depth Study of Diversity and Representation Shows Scale of Opportunity in Media and Entertainment Industries", News Release", 27 September 2021, <https://www.weforum.org/press/2021/09/in-depth-study-of-diversity-and-representation-shows-scale-of-opportunity-in-media-and-entertainment-industries>.
210. See World Economic Forum, "World Economic Forum Launches Audience Representation Index to Provide Diversity, Equity and Inclusion Scores in Media, Entertainment and Sport", News Release, 8 March 2022, <https://www.weforum.org/press/2022/03/world-economic-forum-launches-audience-representation-index-to-provide-diversity-equity-and-inclusion-scores-in-media-entertainment-and-sport>.
211. Wilkinson, Mark D., et al., "The FAIR Guiding Principles for scientific data management and stewardship", *Scientific Data*, vol. 3, no. 160018, 2016, <https://www.nature.com/articles/sdata201618>.
212. World Economic Forum, "Space Sustainability Rating", <https://www.weforum.org/projects/space-sustainability-rating>.
213. Chugh, Abhinav, "How can technological advancements in synthetic biology benefit everyone? An expert explains", World Economic Forum, Agenda, 24 November 2021, <https://www.weforum.org/agenda/2021/11/synthetic-biology-can-benefit-all-expert-explains-how>.
214. Vickers, Claudia, et al., "Realizing the potential of synthetic biology to help people and the planet", World Economic Forum, Agenda, 5 April 2021, <https://www.weforum.org/agenda/2021/04/synthetic-biology-potential-people-and-the-planet-gtgs21>.
215. World Economic Forum Global Future Council on Synthetic Biology, Global Commons Working Group, "Why sharing data is crucial for progress in bioeconomy", World Economic Forum, Agenda, 9 December 2021, https://www.weforum.org/global_future_councils/gfc-on-synthetic-biology/articles/why-sharing-data-and-benefits-is-crucial-for-bioeconomy.



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