Measuring what matters most

Seven systems transformations for benchmarking companies on the SDGs

July 2019

World Benchmarking Alliance

Executive summary

Measuring what matters most

The global challenges we face, from climate disaster to gender inequality, unsustainable food systems to digital exclusion, are interconnected and affect us all. There is a perfect storm brewing with growing pressure to deliver on the Sustainable Development Goals (SDGs) under the United Nation's 2030 Agenda, and the clock is ticking. The private sector has enormous potential to drive change. But there is currently no global accountability mechanism to understand where companies are today and where they need to get to. The World Benchmarking Alliance (WBA) has set out to develop a range of free and publicly available benchmarks by 2023 to assess the progress of 2,000 *keystone companies* against the SDGs.

We all know that 'business as usual' or incremental progress will not deliver the transformations needed to achieve the SDGs. We need business to move beyond pure financial performance and an 'avoid doing harm' mentality, to real measurable positive impact. Our benchmarks will produce insights, data and public rankings of the world's most influential companies so that investors, governments, civil society, individuals and the companies themselves better understand corporate progress and can more effectively hold companies accountable for their role in advancing the SDGs. We want and need business to step up.

Executive summary

Seven transformations for a more sustainable and resilient world

The 2030 Agenda requires that we challenge our current thinking and no longer act in silos. We have learned over the course of global stakeholder consultations involving more than 10,000 people that we cannot assess progress issue by issue, SDG by SDG, given that all areas are interrelated. We have also learned that we cannot evaluate individual companies one by one or even industry by industry; there are simply too many with just a decade left to realise the SDGs.

WBA will use a comprehensive systems approach to develop benchmarks. We need to place a strong emphasis on transforming those systems which have the greatest potential to drive economic, environmental and social progress and achieve the SDGs. Systems thinking can help us make better sense of the issues, as well as identify the most influential companies. WBA will work alongside governments, investors and civil society in a cross-sector partnership to drive change within these keystone companies and beyond.

The power of 7

WBA has identified seven systems transformations we believe are vital to put our society, planet and economy on a more sustainable and resilient path to accomplish the 2030 Agenda.

1 **Social transformation**
Achieve universal human development by respecting human rights, promoting equality and empowering people to pursue the opportunities and choices they value.

2 **Agriculture and food system transformation**
Produce healthy and nutritious food to feed a growing world population, while staying within planetary boundaries, and offer farmers, fishers and their families a decent standard of living.

3 **Decarbonisation and energy transformation**
Provide universal access to modern energy services while significantly reducing the world's dependency on carbon-based energy.

4 **Circular transformation**
Decouple consumption and production from natural resource use and design out waste and pollution.

5 **Digital transformation**
Harness the potential and benefits of digital technologies for all while managing risks, including safeguarding against undesirable effects.

6 **Urban transformation**
Create sustainable, inclusive and connected cities that are safe, resilient and clean.

7 **Financial system transformation**
Reorient the flow of resources and exercise good stewardship to accelerate the economy's transition towards long-term sustainable development.

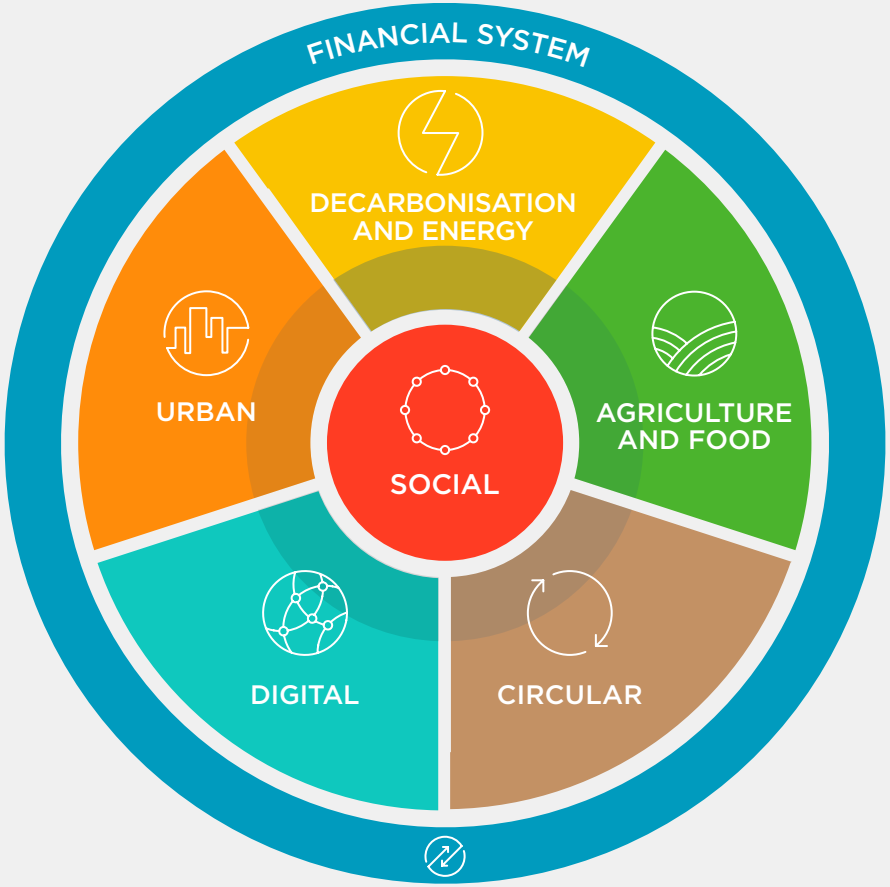
Executive summary

Benchmarking for a more sustainable future

WBA aims to drive the private sector's engagement in the SDGs through its benchmarks, envisioning a future where companies, investors, governments, civil society and individuals can quickly and easily compare businesses and motivate a 'race to the top'. WBA's seven systems transformations presented in this paper offer a strategic framework to develop benchmarks and identify 'keystone companies' – companies whose contribution will be vital if we want to achieve the SDGs.

To provide these companies with a clear path forward, WBA applied systems thinking that helped identify relevant leverage points and areas where business action is needed. Through a multi-stakeholder approach, drawing on our growing network of Allies worldwide, we are pioneering new benchmark methodologies that will serve as roadmaps to guide sectors through the seven systems transformations.

The benchmarks will assess the progress of around 2,000 companies across these seven transformations and demonstrate through public rankings and data how companies perform, both positively and negatively, in regard to the transformations and associated SDGs. The results from these benchmarks will reveal best practices for the private sector under each of the seven systems. Finally, the benchmarks will be designed to facilitate collective action from investors, governments, civil society, companies, individuals and particularly our Allies to drive change across these seven systems further and faster. WBA's benchmarks will empower all stakeholders with the key data and insights required to take action and encourage more sustainable business practices.



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Benchmarking companies across seven systems transformations

In 2015, the UN set out a supremely ambitious and transformational plan of action for people, planet and prosperity. The 17 Sustainable Development Goals (SDGs) and their corresponding 169 targets demonstrate the scale and ambition of this agenda, stimulating action in areas of critical importance for humanity and the planet. Achieving these ambitious goals requires large-scale and profound transformations of the ecological, industrial, technological, financial and human systems that generate or perpetuate economic, environmental and social pressures.

The private sector has a crucial role to play in advancing the SDGs and contributing to systems change, but in order for companies to effectively play their part, business leaders need to have a greater awareness of the systems dynamics and long-term transformations. The World Benchmarking Alliance (WBA) believes that there needs to be a real change in the way that business impact is measured to boost motivation and stimulate action. Together with Allies from government, business platforms, financial institutions, academia and civil society, WBA is developing transformative benchmarks to measure companies' progress against the global challenges we all face. These benchmarks will reveal both to companies and stakeholders where each company stands compared to its peers, where it can improve and where urgent action is needed for it to deliver on the SDGs in its business strategies, operations, supply chains, and product and service portfolios. The benchmarks are informed by best available science and build on existing norms and standards, frameworks and initiatives, many of whose host

organisations are part of the Alliance. These benchmarks will be free for everyone to use and continually improved through an open, multi-stakeholder dialogue. By virtue of being public and due to the way in which the data is presented, these benchmarks will empower all stakeholders, from consumers and investors to employees and business leaders, with key data and insights to encourage sustainable business practices across all sectors.

Benchmarking for a more sustainable future

WBA's first set of benchmarks, listed below, are strongly linked to the transformations needed to put our world on a more sustainable and resilient path and assess companies on key challenges regarding food and agriculture, climate change and energy, digital inclusion, human rights, and gender equality and empowerment. The benchmarks will be developed in close collaboration with WBA Allies.

The Food and Agriculture Benchmark will benchmark 300 leading companies across the entirety of the food system, from farm to fork. It will cover multiple dimensions where transformation is needed: sustainable production, healthy diets and nutrition, and social inclusion. As part of this effort, the Seafood Stewardship Index results (to be released in October 2019) will show how the world's leading seafood companies contribute to the sustainable management of our oceans and coastal ecosystems, as well as how they help ensure responsible social practices are implemented across all stages of the supply chain.

The Climate and Energy Benchmark will measure the climate impact of companies across three critical industries: automotive, electric utilities, and oil and gas. This benchmark, to be launched this year, will incentivise companies to align their strategies and operations with a well below 2-degree pathway recognised in the Paris Agreement and fundamental to the SDGs.

The Digital Inclusion Benchmark will track the contribution of 100 of the most globally significant ICT companies towards improving inclusion across four dimensions – access, use, skills, and innovation – to ensure that benefits from digital technologies are more broadly enjoyed.

The Corporate Human Rights Benchmark tracks the progress and performance of 200 of the largest companies in the apparel, agricultural products, extractives and ICT manufacturing sectors in regard to respecting human rights within their own operations and along their supply chains, building on the UN Guiding Principles on Business and Human Rights.

The Gender Equality and Empowerment Benchmark will assess and compare how companies within critical industries, focusing initially on apparel, are promoting the equality and empowerment of women across their value chain with respect to a broad set of thematic areas.

Benchmarking companies across seven systems transformations

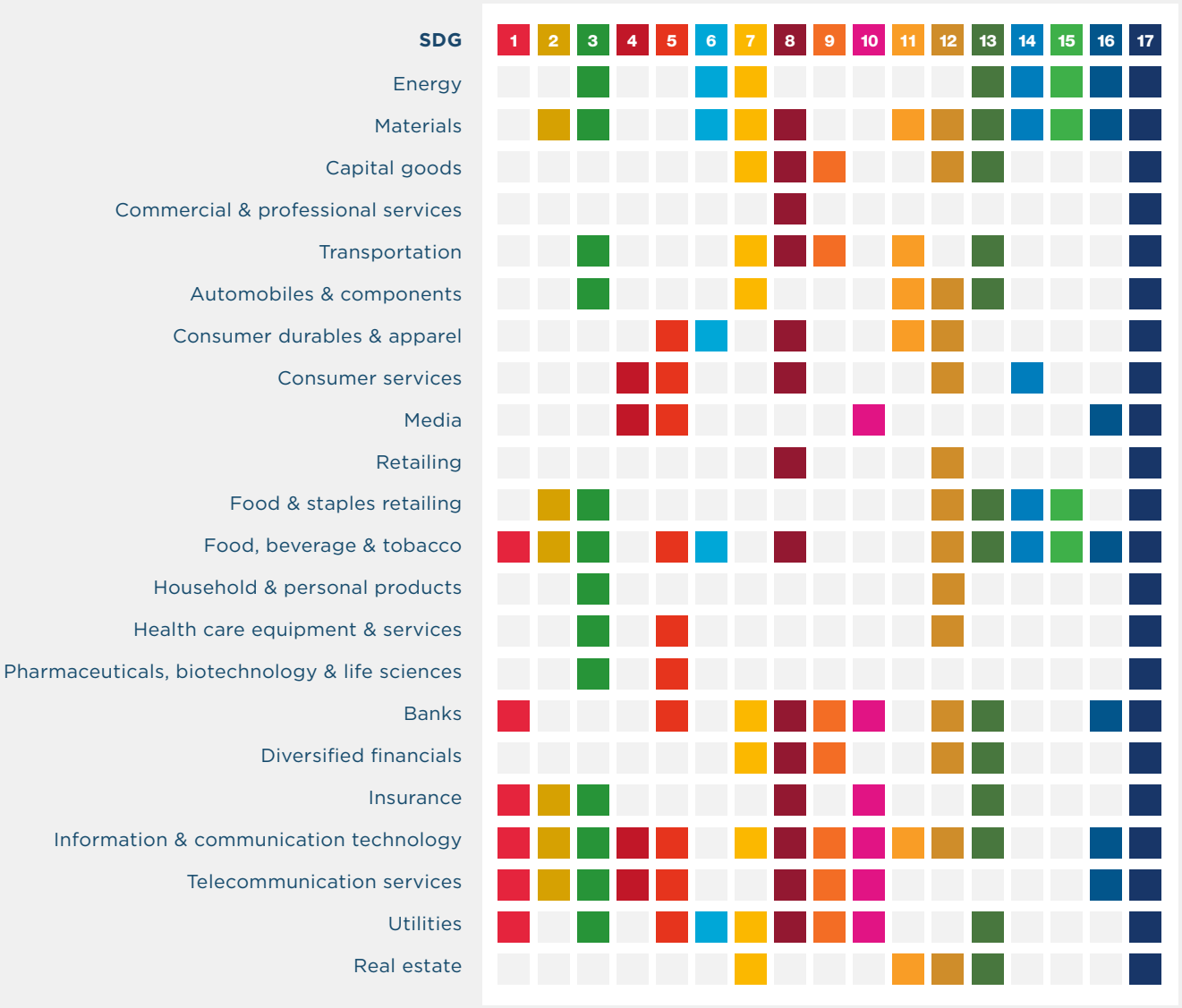


Figure 1: SDG-industry intersections map

The critical intersections between SDGs and industries

Throughout WBA's consultation phase, we analysed which industries could make the most substantial contributions to achieving each of the SDGs and their corresponding targets. We also explored where people believe to be the critical links between industries and SDGs, consulting over 10,000 people from all over the world, both online and in person. The outcomes resulting from our analyses and consultations are summarised in the *SDG-industry intersections map* (see Figure 1). While every industry can be linked to each of the 17 SDGs, this map focuses on where a given industry can have the greatest impact, both positive and negative. The industries are based on an adapted list from the Global Industry Classification Standard (GICS).[I]

[I] The GICS industry groups software & services, technology hardware & equipment, and semiconductors & semiconductor equipment were merged into information & communication technology.

This map identifies the relationship between industries and the SDGs, as well as provides a valuable basis for discussing the impact of different industries. However, it does not fully capture the interconnected and interdependent nature of the SDGs, nor does it explain how the SDGs can be implemented. Recognising that there are important links between different goals and targets[1] and that sustainability requires a long-term horizon,[2] WBA has developed a framework that does not simply focus on specific industries or SDGs but rather recognises their integrated nature.

Our transformations framework is based on systems thinking. This framework provides focus to our work and helps guide the identification and development of our benchmarks. It builds on important initiatives that have already explored which systems changes and pathways are required to attain all 17 SDGs and sustainability beyond 2030. These pathways show that despite synergies and trade-offs between the SDGs, achieving the 2030 Agenda is feasible if every stakeholder adopts actions in line with the SDGs and the Paris Agreement.[3] However, we are in a race against the clock, and siloed thinking won't get us very far. We need to start thinking in systems to speed up the transformations, which are so urgently needed to put our world on a more sustainable and resilient path.

This research paper describes the systems that need to be transformed and why, explains how these transformations are linked to the SDGs and lists the industries[II] that are particularly important for driving each transformation. The thinking is designed to inform not only how we benchmark companies, but also how we can practically apply the insights and data from these benchmarks to accelerate the private sector's contribution.

Systems transformations for sustainable development

The world has seen extraordinary progress in areas such as life expectancy,[4] extreme poverty[5] and technological innovation.[6] However, we are facing a time of immense challenges to sustainable development: billions of people still live in poverty;[7] the threat of climate change is ever growing;[8] peace, stability[9] and human rights[10] are under threat; nature is declining at rapid rates, and the rate of species extinctions is accelerating;[11] inequality continues to rise;[12] the speed and scale of urbanisation is unprecedented;[13] and levels of biodiversity loss are alarmingly high.[14] These pressures are the result of a seriously unbalanced global system[15] that is negatively impacting our Earth. This current path is unsustainable, reflected in our mixed progress on the achieving the SDGs.

Despite important progress in some areas, we are not on track to achieve all SDGs by 2030.[16, 17] There is growing awareness that the SDGs, the Paris Agreement and continued sustainable development beyond 2030 can only be achieved through *transformational change*. As emphasised in the 2030 Agenda, bold and transformative steps are required to shift the world onto a sustainable and resilient path.[7] Without these transformations, we will never truly achieve socially inclusive, environmentally sustainable and economically thriving societies.[3]

Benchmarking companies across seven systems transformations

Due to their multifaceted and interconnected nature, tackling these massive challenges requires a systems-based approach.[18] Systems thinking recognises the dynamic interdependencies between different groups, such as companies, and their contexts. It recognises that there are constant feedback loops and flows between different elements of a system. These feedback loops can be reinforcing, accelerating change in a system towards a positive or negative trend, and lead to either exponential growth or runaway collapses over time. They can also be balancing, since elements within the system can offset each other and function as both a source of stability and of resistance to change.[19] To understand these feedback loops, one must gain insight into how various parts of a complex and dynamic system influence each other.[20] Systems thinking recognises that by leveraging change in targeted areas, one can drive disproportionate impact through wider knock-on effects.

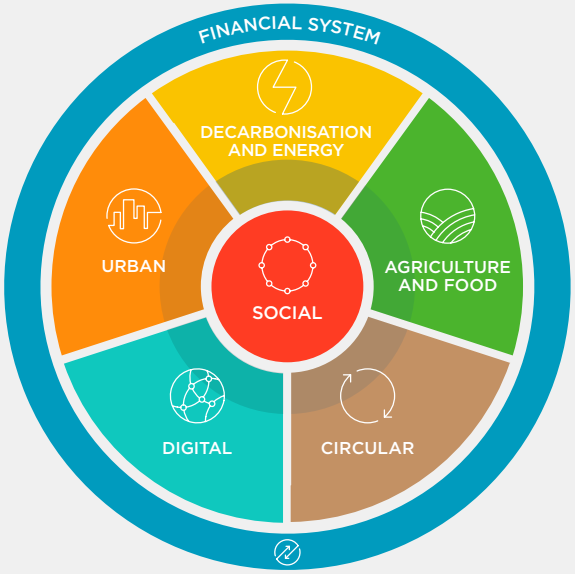
Achieving systems change – the "intentional process designed to alter the status quo by shifting and realigning the form and function of a targeted system"[21] – requires large-scale and fundamental changes in the political, economic and financial systems to keep them from prompting environmental and social degradation. Systems are unpredictable, complex and difficult to control.[22] Changing and restructuring systems thus requires a firm grasp of their intricacies and awareness of the levers that have a strong effect on the system, also referred to as 'leverage points'. These leverage points are places within a complex system, such as a sector, company, economy, city or ecosystem, "where a small shift in one thing can produce big changes in everything".[19] Taking a systems-based approach also means looking beyond quick fixes and shifting away from reactive problem solving which may accidently create more problems as a result of unintended consequences. Instead, the focus should be on carrying out more aspirational and disruptive solutions which promote the health and functioning of systems that create shared prosperity and human security.[23] As many sustainability challenges are coupled with and intensified by strong path dependencies and lock-ins,[24] systems transformations require profound changes in dominant institutions, practices, technologies, policies, lifestyles and thinking.[25]

Benchmarking companies across seven systems transformations

Systems transformations for sustainable development

WBA has identified seven systems transformations which we believe are necessary to put our society, economy and planet on a more sustainable path and ultimately achieve the SDGs (Figure 2). These transformations are based on extensive research as well as detailed feedback from our Allies.

Figure 2: The seven systems transformations



Though these transformations are broad and complex, the essence of each transformation is summarised below. More detailed descriptions of the systems that need to be transformed, as well as their links to specific SDGs and industries, are found later in the paper.

1 **Social transformation**

Achieve universal human development by respecting human rights, promoting equality and empowering people to pursue the opportunities and choices they value.

2 **Agriculture and food system transformation**

Produce healthy and nutritious food to feed a growing world population, while staying within planetary boundaries, and offer farmers, fishers and their families a decent standard of living.

3 **Decarbonisation and energy transformation**

Provide universal access to modern energy services while significantly reducing the world's dependency on carbon-based energy.

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Decouple consumption and production from natural resource use and design out waste and pollution.

5 **Digital transformation**

Harness the potential and benefits of digital technologies for all while managing risks, including safeguarding against undesirable effects.

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Create sustainable, inclusive and connected cities that are safe, resilient and clean.

7 **Financial system transformation**

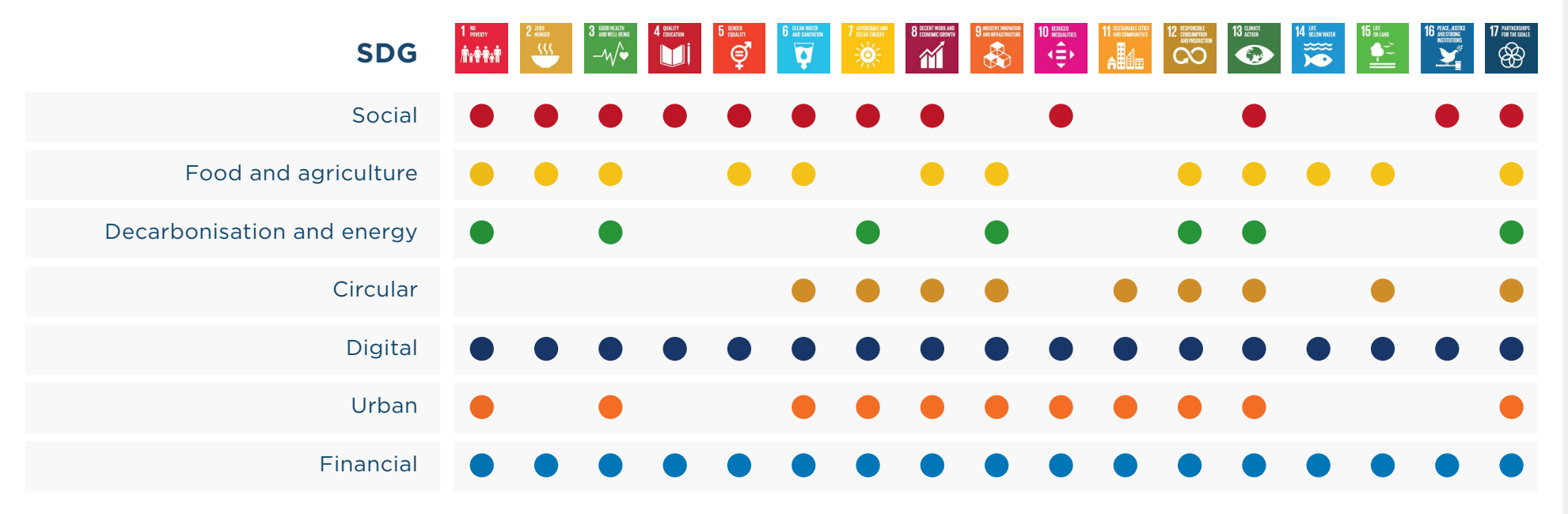
Reorient the flow of resources and exercise good stewardship to accelerate the economy's transition towards long-term sustainable development.

Benchmarking companies across seven systems transformations

Each of these seven systems transformations contributes to multiple SDGs, with SDG 17 (Partnerships) enabling all transformations (Table 1). Each transformation involves multiple industries, and they all overlap – there are no clear boundaries between them. For this reason, some industries and individual companies will span multiple transformations.

Table 1: Systems transformations and the SDGs

This overlap holds particularly true for the social transformation. As the social transformation impacts and is impacted by all other transformations, underpinning and enabling them, it sits at the heart of the seven transformations. A world without human development – based on human rights, equality and empowerment – is a world where none of the other transformations can be fully achieved. For this reason, WBA will assess all companies against the social transformation to create a future that leaves no one behind.



Benchmarking companies across seven systems transformations

These systems transformations call for the active involvement of civil society, governments, academia, business, financial institutions and individuals alike, as well as require far-reaching changes along material, technological, organisational, institutional, political, socio-cultural and economic dimensions.[24] Given the transformations' complexity and the number of stakeholders with potentially competing agendas and value systems, the scale and scope of these transformations are so vast that no sector will be able to manage them alone, and sectors will need to collaborate substantially. Also, the relative power and influence, therefore actionability, of different stakeholders varies between systems and SDGs. For some transformations, it is important that business leads the shift, and for others, government should play a primary role to change the rules of the game. Regardless, these transformations can only be achieved through collective action in which government, civil society and industry work together to drive change, with each actor incentivising the other.

Our seven systems transformations build on existing research and overlap with many of the systems others have identified. We have come to slightly differently conclusions (for example, choosing fewer or more systems) due to our different objectives. WBA's systems transformations have been specifically selected for the purpose of understanding and benchmarking the private sector's contribution to the SDGs.

The following sources were especially useful in guiding our thinking around WBA's seven transformations:

- The 17 SDGs of the *2030 Agenda for Sustainable Development*.
- The six transformations identified by The World in 2050 initiative (TWI2050)[III] described in the report "*Transformations to Achieve the Sustainable Development Goals*" and developed further in the "*Sustainable Development Report 2019: Transformations to Achieve the Sustainable Development Goals*". The Six SDG Transformations cover: education, gender and inequality; health, wellbeing and demography; energy decarbonisation and sustainable industry; sustainable food, land, water and oceans; sustainable cities and communities; and digital revolution for sustainable development.
- The four key nexus systems crucial for global sustainability and development where interventions are needed to change the future pathways in a favourable way, as outlined in the "*Global Commons in the Anthropocene: World Development on a Stable and Resilient Planet*". These systems include the energy system, food system, water system and urban system.
- The structural transformation in five key economic systems outlined in report "*Unlocking the Inclusive Growth Story of the 21st Century: Accelerating Climate Action in Urgent Times*", which was published by the Global Commission on the Economy and Climate in its flagship project the New Climate Economy.[IV] These economic systems include clean energy systems, smarter urban development, sustainable land use, wise water management and a circular industrial economy.

- The *WBCSD* identifies six economic systems through which it targets the realisation of the SDGs: circular economy; cities and mobility; climate and energy; food and nature; people; and redefining value.
- The radical transformation of the food system required to meet the SDGs and the Paris Agreement, as outlined by the EAT-Lancet Commission on Food, Planet, Health[V] in the recently published report "*Food in the Anthropocene: the EAT-Lancet Commission on Healthy Diets From Sustainable Food Systems*".
- The outcomes of the UNEP *Inquiry into the Design of a Sustainable Financial System*, which focuses on advancing options to align the financial system with sustainable development.

The work of Donella Meadows, the pioneering environmental scientist and systems thinker, as well as Kate Raworth, author of *Doughnut Economics*, were also important in shaping our thinking, alongside the many other references cited.

[III] TWI2050 was established by the International Institute for Applied Systems Analysis (IIASA) to provide scientific foundations for the 2030 Agenda. It is based on the voluntary and collaborative effort of over 60 authors from about 20 institutions, and some 100 independent experts from academia, business, government, intergovernmental and non-governmental organisations from all regions of the world. Their report "Transformations to achieve the Sustainable Development Goals" outlines the current trends and dynamics that promote and jeopardise the achievement of the SDGs. The report identifies six exemplary transformations which will allow achieving the SDGs and long-term sustainability to 2050 and beyond.

[IV] The Global Commission on the Economy and Climate, and its flagship project the New Climate Economy were set up to help governments, businesses and society make better-informed decisions on how to achieve economic prosperity and development while also addressing climate change. It was commissioned in 2013 by the governments of Colombia, Ethiopia, Indonesia, Norway, South Korea, Sweden, and the United Kingdom. The Global Commission comprises 28 former heads of government and finance ministers, and leaders in the fields of economics, business and finance, and operates as an independent body.

[V] The EAT-Lancet Commission on Food, Planet, Health brings together more than 30 world-leading scientists from across the globe to reach a consensus that defines a healthy and sustainable diet. It has delivered the first full scientific review of what constitutes a healthy diet from a sustainable food system, and which actions can support and speed up food system transformation.

The role of business in achieving the seven systems transformations

Our current global economic and financial model does not sufficiently incentivise positive change. It rewards shorter-term objectives rather than long-term value, in particular when it comes to considering business externalities.[26] This has resulted in a widely held view that excessive focus on short-term shareholder value has led to business becoming detached from the societies it is meant to serve.[27] And while companies are involved in the SDGs and helping to advance their progress, research finds that the world's major companies engage primarily with SDG targets that are internally actionable and help them 'avoid doing harm'.[28] While there is great

potential for multinational companies to be active change agents and significantly accelerate the pace of progress on the SDGs, this narrow focus makes their contributions to the SDGs relatively constrained. We know that neither 'business as usual' nor incremental progress will deliver the necessary sustainability transformations.[29, 30] We need business to move beyond pure financial performance and harm avoidance towards real measurable impact and proactive action to do good.

Business can and should play a key role in driving these seven systems transformations. There are many ways in which business can do this, for example, by creating sustainable, inclusive and innovative working environments, developing new technologies, products and services that respect human rights and promote development, and providing decent and well-paid employment. Companies must ensure responsible and sustainable conduct across their operations and wider value chains. They should also support a legitimate role for the regulators and governments driving this agenda and contribute to public provision by paying their taxes.

Driving these systems transformations requires companies and investors to understand the feedback loops that exist between their investments, products and services, their value chains and these wider systems. For individual companies, contributing to these systems transformations would entail an integrated approach to value creation where financial value creation is harmonised with maintaining and enhancing social and ecological systems in which the business operates.[31] This integrated approach to value creation considers different capitals and the carrying capacities of the system-wide capitals.[32] Companies need to create 'system value' by focusing on activities that advance, rather than hinder, society's progress to a flourishing future[18] where all individuals can realise their human rights and benefit from development. This demands a shift from incremental to exponential and experimental mindsets, as well as an evolution of current business models to breakthrough, SDG-oriented business models that understand business as part of wider systems and deliver on positive impacts for these systems.[33] For investors, this means creating a better understanding of how their investments and portfolios impact the broader environmental, societal and financial systems in which they operate, as well as the impact of the well-being of those systems on their investment practices.[34]

These transformations also call for more than just individual companies to drive the necessary shift towards more sustainable markets and economies; whole sectors have to move.[29] Different sectors have different roles in driving and accelerating the seven systems transformations. 'Roadmaps' could help to guide each sector through these transformations. Relevant industries that can be catalytic for each system transformation are shown in Table 2.

Benchmarking companies across seven systems transformations

	Social	Food and agriculture	Decarbonisation and energy	Circular	Digital	Urban	Financial
Energy	●		●				
Materials	●	●	●	●		●	
Capital goods	●			●		●	
Commercial & professional services	●						
Transportation	●		●			●	
Automobiles & components	●		●	●			
Consumer durables & apparel	●			●			
Consumer services	●	●					
Retailing	●			●			
Food & staples retailing	●	●					
Food, beverage & tobacco	●	●					
Household & personal products	●			●			
Health care equipment & services	●						
Pharmaceuticals, biotechnology & life sciences	●						
Banks	●						●
Diversified financials	●						●
Insurance	●						●
Software & services	●				●	●	
Technology hardware & equipment	●			●	●		
Semiconductor & semiconductor equipment	●				●		
Telecommunication services	●				●	●	
Media & entertainment	●				●		
Utilities	●		●			●	
Real estate	●		●			●	

Table 2: Systems transformations and GICS industry groups

Benchmarking companies across seven systems transformations

The role of benchmarks in accelerating the seven systems transformations

According to *The World in 2050*, a global research initiative in support of a successful implementation of the 2030 Agenda, "governments and businesses often focus on incremental change and lack the tools, institutions, and knowledge to undertake the long-term transformations".[3] For business, managing these deep and long changes calls for roadmaps that lay out the pathways to a sustainable future. The roadmaps should be sector-specific to guide entire sectors through these transformations. WBA is already working to develop benchmark methodologies that will provide roadmaps to set out how certain sectors can contribute to the transformations and SDGs closest to their core business. Our benchmarks will address crucial topics in the form of specific 'measurement areas', as well as include aspirational indicators that push the boundaries of what is considered possible today.

Companies often deal with a wide range of stakeholders with diverging expectations and priorities. Through an extensive multi-stakeholder process, WBA's benchmarks identify common ground among stakeholders and work to build consensus around these expectations. Our benchmark methodologies translate these expectations into clear metrics, providing companies with a path forward. These methodologies are based on an extensive and iterative process of stakeholder feedback and scientific input. By making the methodologies publicly available, we want to create new, global best practice standards that help industries deliver on the SDGs.

WBA uses the benchmark methodologies to assess company-by-company data, resulting in a ranking. The benchmarks' results help indicate where industries and individual companies stand in their journey towards a more sustainable future, show what best practice looks like and pinpoint where more action is needed. They also paint a picture of the future and inspire innovation.

By harnessing companies' competitive spirit, benchmarking can promote a 'race to the top' in which leaders are motivated to do more, while laggards are motivated to catch up. In addition, the regular issuance of benchmark results will provide companies with a stronger incentive to swiftly improve and demonstrate their progress over time.

New information flows and feedback loops

The digital revolution has meant that information is everywhere. In some areas of the economy, we are overwhelmed with data. However, specific insight into how companies are performing on the SDGs is lacking. There is currently no global, public mechanism for assessing corporate progress on the SDGs. Indeed, the current mixed progress on the SDGs is in part due to "undesirable behaviours characteristic of the system structures that produce them".[22] One of the most common, but also rectifiable, causes of the malfunctioning of systems is the missing flow of information.[22]

Without information, particularly that which is timely and accurate, feedback loops do not function properly and systems are not able to self-regulate or improve. Despite the promulgation of business' role in achieving the SDGs, there is limited information on how companies' actions, value chains, and products and services actually generate positive or negative social and environmental impact.[35] Many current sustainability ratings are proprietary, closed assessments, and many existing metrics focus on a company's direct operations. However, the SDGs are about impact, thus companies should be measured by how their operations, products and services, and supply chains affect people, communities and the planet.[36, 37]

True impact measurement is still in the early stages of development,[36] and the social and environmental impact of companies and investments, therefore, remains largely opaque.[38] As a result, investors, civil society, governments and consumers have no common, public mechanism through which to review the impact of corporate actions. Existing feedback mechanisms are clearly not enough; we are not steering the private sector towards more sustainable behaviours fast enough. Improving information flows through developing feedback systems that drive the SDG agenda, while paying attention to unintended consequences, can be a very powerful lever for change. Thus, WBA was established to provide all stakeholders with more information and feedback through its benchmarks.

Acting as a fundamental accountability mechanism, corporate sustainability benchmarks are a vital first step towards shedding light on the reality of corporate impact today. WBA recognises, however, that we cannot achieve the necessary transformation on our own solely through the use of benchmarks. Consequently, we created an Alliance to promote accountability, engagement and action from investors, civil society, governments and companies surrounding the benchmarks' results. In doing so, we hope to contribute to creating new and improved feedback loops in these seven systems that accelerate corporate action and progress on the SDGs and the Paris Agreement.

The seven systems transformations

Below, we provide more details on the seven systems that need to be transformed for sustainable development and illustrate why a shift is necessary in these areas. We also explain how these transformations are linked to the SDGs and list the industries that are particularly important for driving each transformation.

Social transformation

The social transformation underpins and enables all of the other systems. Without respect for human rights, equality and empowerment, none of the SDGs can be fully achieved. For this reason, we will assess all companies on a social transformation component.

Human rights and human development should be at the core of corporate sustainability action

Human rights are the bedrock of human development.[39] All companies and their investors have a responsibility to respect human rights[40] and support civic freedoms and the rule of law, as well as those who defend them.[41] Consequently, human rights must be at the core of business' contribution to the SDGs. Only when companies act to eliminate the human rights risks in their operations and value chains can they deliver the people-centred sustainable development that the SDGs set as our global ambition. To do this, companies must be transparent and take action, led from the top, to undertake the human rights due diligence set out in the UN Guiding Principles on Business and Human Rights. As part of this process, businesses must identify the risks they create for the workers, communities, consumers and societies where they operate, seek to prevent and mitigate risks, and provide access to remedy when things go wrong. In addition, companies should work to address inequalities of power and wealth in their relations with workers, communities and consumers to ensure that the human rights of all are respected.

Business can also promote human development – enlarging people's freedoms and choices, enhancing their capabilities and improving

their opportunities[39] – by innovating beneficial goods and services, providing decent, well-paid jobs and training, empowering workers and their organisations, and paying their taxes, which support governments in delivering essential public services. Human rights and human development are interrelated and interdependent. When human development and human rights advance together, they reinforce each other, protecting people's fundamental rights and freedoms while expanding people's capabilities.[42] As every individual company has a responsibility to respect human rights and contribute to advancing human development, all industries have a role in driving this system transformation.

The SDGs place people first

At their core, the SDGs promote a people-centred agenda that envisions a world where "all life can thrive", as the goals "seek to realize the human rights of all and to achieve gender equality and the empowerment of all women and girls".[7] In order for this to be possible, human rights must be respected, basic human needs be met and the current societal structures that constrain people from living a self-determined life be transformed.[43] These changes are captured most profoundly in the following SDGs:

Root causes that produce social, political and economic problems need to be addressed

Long-term human thriving is the goal of sustainable development.[43] For social change to be transformative, the root causes of social, political and economic problems need to be addressed, such as inequality of power and wealth, the denial of rights and ecological crises. There also must be a shift away from focusing solely on the resulting symptoms.

A social transformation would require the realisation of three sets of achievements: material, social-cultural and political. *Material achievements* refer to basic needs, such as education and access to information and knowledge, good health, and access to safe, nutritious and sufficient food and water (SDGs 2, 3, 4, 6 and 7). *Socio-cultural achievements* are centred around leading a dignified life and achieving a decent standard of living with both security and stability (SDGs 1, 5, 8, 10 and 13). Lastly, *political achievements* refer to agency, participation and representation (SDGs 5 and 16).[43, 7] These achievements must be enjoyed by all and should expand every person's opportunities and choices so they can realise their full potential and live the lives they value.[39]

We also need to address the needs and uphold the rights of marginalised and disadvantaged populations

Over the last 25 years, the world has witnessed impressive progress in human development. Yet human development has been uneven and human deprivations persist.[39] More children are in school, more

people have access to basic social services and they live longer.[39] However, inequality is on the rise, and the gap between the rich and poor continues to widen.[12] This is driven by inequalities in education, followed by income inequality and life expectancy.[39] Over the past three decades, there has been an increase in income inequality in over half of all countries, particularly in advanced economies.[44, 45] The poorest ten percent earns between two and seven percent of total global income, compared to a 40 percent share for the richest ten percent.[46] The World Economic Forum highlights both the rising income and wealth disparity and the increasing polarisation of societies as two of the top global risks to the world economy.[44] Beyond its negative impacts on social cohesion, growing inequality hampers long-term economic growth[12] and negatively impacts human health.[47] In total, it is estimated that 22 percent of the world's human development is lost because of inequality.[39]

Reducing inequalities relies on interventions that pay attention to the needs and uphold the rights of marginalised, vulnerable and disadvantaged populations who are at the greatest risk of being left behind.[46, 39] This includes women and girls, people with disabilities, religious, ethnic and linguistic minorities, afro-descendants, indigenous populations, and refugees and migrants. It also requires addressing key barriers and forms of exclusion that stand in the way of universal human development, such as intolerance, narrow self-identities, elite capture of institutions and weak bargaining power.[39]

To ensure that human development reaches those left behind, significant investments are required. It is estimated that an additional US$371 billion will be needed per year for low- and middle-income countries to reach SDG 3 targets promoting good health and well-being.[48] Achieving SDG 4 targets on quality universal pre-primary, primary and secondary education in low- and lower-middle income countries will require an additional US$39 billion per year between 2015 and 2030.[49] Reaching the SDG 6 targets on universal and equitable access to safe drinking water and sanitation will require countries to spend US$150 billion per year.[50] However, many of these investments in advancing human development can have strong and multiple impacts, especially when they are designed to uphold and respect human rights. For example, investments in girls' education can have huge positive impacts on societies, with benefits ranging from reducing maternal mortality to narrowing pay gaps.[51] More broadly, if parity between women and men in the labour market was achieved, this could add as much as US$28 trillion to global annual GDP by 2025.[52]

Inequality negatively impacts human development

As it stands, many people across the world are not having their basic needs met and face multiple barriers to living a long and healthy, self-determined life. Research finds that in regard to addressing basic needs, the world is on course to leave billions of people behind in 2030.[17] Weak health systems remain an obstacle in many countries, resulting in deficiencies in coverage and under-utilisation of even the most basic health services.[53] It is estimated

that one in nine people in the world are undernourished, three in ten lack access to safe drinking water and six in ten lack access to sanitation facilities.[54, 55] Around half of the world's population live on less than US$2 a day, and having a job is not a guaranteed route out of poverty.[56, 57] Over 40 million people are victims of modern slavery, of which one in four are children.[58] Children from the poorest households are up to four times more likely to be out of school than children from the richest households, with more than half of the 57 million primary-aged out-of-school children living in Sub-Saharan Africa.[59] In addition, over half of children and adolescents globally do not meet the minimum proficiency standards in mathematics and reading.[60] In 18 countries, husbands can legally prevent their wives from working, and globally, 750 million women and girls were married before the age of 18.[61] These facts show that human rights are denied to billions, as both citizens and workers, and many people are not empowered to pursue the choices they value and realise their full potential, negatively impacting people's current opportunities and well-being and for those in future generations.

Agriculture and food system transformation

The private sector is the key producer and supplier of food

Food and agriculture systems are comprised of inputs, production, sourcing and trading, processing and manufacturing, and distribution and marketing, as well as the interactions between these. The private sector, ranging from small-scale producers to large multinational companies, provides nearly all the food we eat and represents a majority of investments into food systems.[62] Business, therefore, has a vital role to play in making food and land-use sustainable, safeguarding human health, and providing nutritious and safe foods at affordable prices. Key industries that can drive this transformation in food and land-use systems include: materials; consumer services; food & staples retailing; and food, beverage & tobacco.[VI]

Businesses across the food value chain can contribute to delivering more than a quarter of the SDG targets

Creating a sustainable food system[VII] requires a system that prioritises nutrition, a sustainable environment and producer livelihoods, as well as promotes sustainable land use. There are strong connections between these core dimensions and the SDGs. The SDGs underscore the importance of sustainable land-use and food systems by setting targets for combating hunger and malnutrition, making agriculture sustainable, lowering GHG emissions, ensuring the sustainable use of water resources, and protecting terrestrial and marine ecosystems.[63] Research finds that businesses in the food system could be key to delivering more than a quarter of the 169 SDG targets.[64] Transforming our food and agriculture system will have a notable influence on the following SDGs:

From farm to fork, a more integrated approach to the food value chain is needed

The world faces the enormous challenge of feeding a growing global population with healthy and nutritious food, while producing it with the fewest resources and impact possible. Today, land-use and food

systems are unsustainable and highly vulnerable in almost every country.[63] Food production is the largest pressure caused by humans on Earth, and unhealthy diets represent the largest global burden of disease.[65] Transforming our food and agriculture system into one that is inclusive, sustainable for the environment and stays within planetary boundaries, while offering healthy and nutritious diets for all, requires profound changes on both the supply and demand sides. It calls for restricting the expansion of agricultural land, safeguarding existing biodiversity, reducing consumptive water use and responsibly managing water supply, while substantially reducing nitrogen and phosphorous production, achieving net zero carbon dioxide emissions and curbing further increases in methane and nitrous oxide emissions.[65] In addition, it demands well-functioning markets, better livelihoods for smallholder farmers, major shifts in consumption habits, improved accessibility and affordability of safe and nutritious food, greater access to technology, finance and land, and more investments in the agricultural sector.[66] Although different segments of the global food supply chain have often worked in isolation, there is a growing realisation that a more integrated approach across the food value chain is needed to tackle the many issues confronting the food system.[67]

Challenges in the food system are widespread, but addressing them could result in significant value for society and business

By 2050, with an estimated world population of nearly 10 billion people, food demand is expected to increase by 54 percent,[68] and agricultural production may need to increase by some 70 percent by 2050 compared to 2005/2007 levels. Production in developing countries might have to nearly double.[69] Today, our food system leaves an estimated 815 million people undernourished[70] and at least two billion people vitamin and micronutrient deficient.[71] If current trends continue, one in two people could be malnourished by 2030, which stands in stark contrast to the objective to end all forms of malnutrition by 2030.[62] It is estimated that an additional US$267 billion per year for investments in rural and urban areas and in social protection is required to end world hunger by 2030[72] Significant investments are also needed to reduce the negative impacts of climate change through adaptation and building resilience into agricultural systems.[73] And though hunger and food-insecurity are on the rise,[70] obesity has tripled over the last forty years. Today, more than 1.9 billion adults are overweight and, of these, 650 million are obese.[74] Worldwide, the economic impact of obesity is estimated to be around US$2 trillion per year.[75] The EAT-Lancet Commission shows that shifting towards healthy diets would result in major health benefits, including the prevention of about 11 million deaths, or 19-24 percent, per year.[65] Despite the significant unmet demand for food, about one-third of food produced for human consumption is lost or wasted, equalling about 1.3 billion tonnes per year – enough food to feed two billion people[76] – worth almost US$1 trillion in economic cost, US$700 billion in environmental costs and US$900 billion in social costs.[77] If current trends continue, this number could rise to 2.1 billion tonnes annually by 2030 – worth US$1.5 trillion.[78] According to the Business and Sustainable Development Commission, there are significant opportunities for business to address current challenges in the food and agriculture

system, which could have a value of over US$2.3 trillion annually by 2030 and create almost 80 million jobs. Moreover, most of this value and jobs will be concentrated in developing countries.[64]

We must ensure that agriculture and food systems are inclusive and contribute to human and planetary health

Our food system has a dramatic effect on human and planetary health; however, the way the current system functions will not 'self-correct' negative impacts.[62] As a result of rising income levels and population growth, and in the absence of technological changes and dedicated mitigation measures, the environmental pressures caused by the food system could increase by 50-92 percent in five key domains (i.e. GHG emissions; cropland use; bluewater use; nitrogen application; phosphorus application).[79] These levels are beyond planetary boundaries that define a safe operating space for humanity.

Agriculture is the main culprit in the transgression of two of the nine planetary boundaries: biosphere integrity and biochemical flows. It is also pushing two planetary boundaries that are increasingly at risk (land-system change and freshwater use) and a significant contributor to the other boundary that is at risk (climate change). Today's food supply chain creates about one-quarter of anthropogenic GHG emissions.[80] Climate change, in turn, adversely impacts both crop yields and their nutritional content and poses serious risks for the world's food supply. Agriculture is also a contributor of change to many of those planetary boundaries still in the safe zone.[81] Crop and grazing lands now cover more than one-third of the Earth's land surface.[11] The rapid and unsustainable expansion and management of these crop and grazing lands displaces local populations, damages ecosystems of high conservation value, and acts as the most extensive direct driver of land degradation and deforestation globally.[11, 82] Overexploitation and agricultural activity are also the dominant causes of biodiversity decline.[14]

Overfishing is considered the second largest threat to our oceans, after climate change. Almost 30 percent of wild fish stocks are considered overfished and 60 percent fully exploited.[83] In addition, many smallholder farmers who provide the foundation of food production are caught in a poverty trap. It is estimated that over one billion farmers today are stuck in poverty trap landscapes which are characterised by inefficient farming practices, ecosystem degradation, a lack of professionalisation and low socio-economic mobility.[84]

Despite these significant challenges, recent research shows that it is possible to transform our food system to provide healthy diets for the 10 billion global population by 2050, while remaining within a safe operating space. However, this can only be achieved through multisector, multilevel action that entails a shift towards healthy diets, substantial reductions in food loss and waste, and major improvements in food production practices.[65] Safeguarding better livelihoods for farmers will also be key to ensuring this transformation is inclusive and contributes to ending poverty and hunger.

[VI] GICS Industry groups

[VII] A food system can be defined as a system "that gathers all elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the outputs of these activities, including socio-economic and environmental outcomes"[62].

Decarbonisation and energy transformation

Energy producers and energy intensive industries have a pivotal role in decarbonising the energy system

Providing universal access to modern energy services while significantly reducing dependency on carbon-based energy requires active involvement from the private sector. Furthermore, transitioning to a low-carbon economy will require significant capital and contributions from companies across all industries. With global CO^2 emissions from fossil fuels and industry accounting for over two-thirds of global greenhouse gas (GHG) emissions,[85] energy producers and energy intensive industries have an especially pivotal role in the energy transition. Industries that could have a particularly strong impact on decarbonising the economy therefore include: energy; materials; transportation; automobiles & components; utilities; and real estate.[VIII]

Energy is a cornerstone for development, but also the main contributor to climate change

Energy is central to our modern economy, as well as to many challenges and opportunities the world faces today.[86] While energy access is a cornerstone for economic and social development, energy is also the dominant contributor to climate change, accounting for about 60 percent of total GHG emissions.[86] Climate change represents the single biggest threat to development and jeopardises the lives and livelihoods of poor and marginalised people.[39] Increasing energy efficiency and shifting to renewable sources will be crucial for limiting climate change. However, solely reducing carbon emissions is no longer enough to halt its effects;[87] adaptation will also be necessary to cost-effectively manage associated climate change risks.

Decarbonisation and energy transformation

SDG 7 (affordable and clean energy) seeks to ensure universal access to affordable, reliable, sustainable and modern energy services. This is strongly linked to SDG 13 (climate action) and SDG 3 (good health and well-being). Decarbonisation and the energy transition will have an evident impact on the following SDGs:

Decarbonising our energy system is urgently needed to limit global temperature rise

An effective energy system supports inclusive economic development and growth, offers secure and reliable universal access to energy and is environmentally sustainable.[88] The latest IPCC report outlines that while limiting global temperature rise to 1.5°C is still feasible, it will require "rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems" and reducing emission in all sectors.[8] Limiting global temperature rise to 2°C means that energy-related CO^2 emissions would need to peak before 2020 and fall by more than 70 percent by 2050.[89] Phasing out fossil fuels and replacing them with clean energy sources (e.g. wind, solar, hydro, geothermal, ocean and nuclear) and other potential technologies, such as carbon capture and storage (CCS), will be pivotal to dramatically reduce energy-related GHGs and decarbonise our energy system.[3] In addition, significantly improving energy efficiency in final energy use will be of key importance. Renewable energy supply, deep electrification and increased energy efficiency can potentially deliver more than 90 percent of the energy-related CO^2 emissions reductions needed by 2050 to reach the well below 2°C aim of the Paris Agreement.[90]

The energy transition requires significant investment, but its benefits far outweigh the costs

In November 2016, the Paris Agreement on Climate Change came into effect. This historic accord sets out a global action plan for "holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels", strengthening countries' abilities to cope with the impacts of climate change.[91] Delivering this plan requires steep declines in emissions from 2020, preferably before.[92]

Driven by strong economic growth and population increase, demand for energy continues to grow. Limiting global mean temperature rise to well below 2°C requires a significant reduction in the share of fossil fuels used in primary energy demand by 2050 and calls for around 70 percent of the global energy supply mix to be low-carbon in 2050.[89] As the heating and cooling, transport and electricity sectors account for 48, 32 and 20 percent of total final energy consumption respectively,[93] profound changes in these sectors are vital to reduce dependency on fossil fuels.

Decarbonisation and energy transformation

Although the consumption of renewables has risen steadily, reaching about 20 percent of total final energy consumption today,[93] the share of renewables in the world's total final energy consumption needs to grow at least six times faster in order to meet the goals set out in the Paris Agreement.[90] To enable the energy transition, cumulative investments in the energy system would need to increase around one-third between 2015 and 2050, from US$93 trillion to US$120 trillion.[90] According to IRENA and the IEA, this energy transition could boost global GDP by 0.8 percent by 2050 and significantly improve overall human welfare.[89] Impacts from climate change are already occurring, making it vital to adapt quickly. The annual global costs of adaptation are estimated to fall between US$28 billion and more than US$100 billion a year by 2030 and between US$70 and US$500 billion by 2050.[94]

Recent developments stand in strong contrast with emission reductions required by the Paris Agreement

In 2017, global energy-related CO^2 emissions – the largest source of global GHG emissions – rose by 1.4 percent, reaching a historical high of 32.5 $GtCO.^{2, 95}$ In addition, improvements in global energy efficiency slowed down dramatically in 2017.[95] These developments stand in strong contrast with the emission reductions required by the Paris Agreement. Under current policy plans, the world would exhaust its energy-related climate carbon budget in less than 20 years to keep warming below 2°C.[90] Without urgent action, the world will experience increased negative impacts and risks, such as extreme weather events, sea level rise, burdens on biodiversity and ecosystems, and ocean acidification.[8] These negative impacts will have a disproportionate effect on the poorest and most vulnerable for decades to come. Furthermore, it is estimated that the impacts of climate change could push 100 million people into extreme poverty by 2030.[96] According to recent research, the median global social cost of carbon – the economic damages associated with an additional present-day tonne of CO^2 emissions – are as high as US$417 per tonne.[97] On the basis of CO^2 emissions in 2017, this implies a global impact of more than US$16 trillion.[98] A recent report by CDP shows that climate change is likely to cost the world's largest public companies almost US$1 trillion, likely to hit within the next five years. However, growing demand for low-emission products and services, shifts in consumer preferences and increased availability of capital could generate over US$2 trillion in business opportunities.[99]

While there is an urgent need to move to cleaner sources of energy to limit climate change, a significant proportion of the global population does not have access to energy. In 2017, the total number of people without access to electricity fell below one billion for the first time ever.[100] By 2030, roughly 600 million of the estimated 674 million people still without access will be in Sub-Saharan Africa, mostly in rural areas. This electricity deficit creates a fundamental barrier to economic development and impacts a wide range of development challenges, such as health, food security, education, gender equality, livelihoods and poverty reduction. Decarbonising the power system combined with decentralised and digitally enabled electrification technologies can contribute to universal access to modern energy services.[101]

[VIII] GICS Industry groups

Circular transformation

All sectors can be impacted by a circular transformation

The shift to a circular economy, an industrial system that is restorative or regenerative by intention and design, will affect all sectors and policy domains.[102] It will require employing business model changes that are truly transformational, making companies and consumers key in driving this process.[103] It requires a systemic shift in product design, resource flows and value creation.[104] A number of sectors face specific challenges in the context of a circular economy due to the specificities of their products or value chains, their environmental footprint or their dependency on raw materials.[103] These sectors include: materials; capital goods; automobiles & components; consumer durables & apparel; retailing; household & personal products; and technology hardware & equipment.[IX] This transformation can be enabled by and is highly synergistic with the digital transformation, as digital technologies can contribute to improved use of resources, increased efficiencies, more sustainable consumption patterns, and higher rates of recycling and recovery of materials.

Pursuing circular practices can contribute to over a quarter of SDG targets

SDG 12 (responsible consumption and production) specifically addresses the need to reduce our ecological footprint by changing the way we produce and consume goods. Sustainable consumption and production practices will simultaneously contribute to the achievement of many other SDGs, directly or indirectly, and can be considered an enabler for driving progress on a range of other goals.[105] Research finds that circular economy practices contribute

directly to 21 SDG targets and indirectly to an additional 28 targets, out of the 169, with the strongest relationships existing between circular economy practices and SDGs 6, 7, 8, 12, and 15.[106] A more circular economy will have an important impact on the following SDGs:

The circular economy requires a shift in how products are designed, produced and consumed

The linear 'take, make, dispose' economic model has been at the heart of industrial development from the beginning, generating an unprecedented level of growth.[107] However, this pattern relies on large quantities of cheap, easily accessible materials and energy, contributing to the depletion of resources, economic losses and structural waste.[107] Shifting to a circular economy requires decoupling economic activity from the consumption of finite resources, while also eliminating waste and pollution.[108] This has important implications for how products are designed, produced and consumed, as well as how waste is managed.[103] Important principles of the circular economy include designing out waste and pollution, keeping products and materials in use and regenerating natural systems.[109] Moreover, in circular systems, there is a strict differentiation between consumable and durable components of products. For consumable components, this means the use of non-toxic and biological ingredients that can be safely returned to the biosphere. Durables components made of technical nutrients unsuitable for the biosphere, such as metals and most plastics, should be designed for reuse. The energy required for this system should be renewable to decrease dependency on non-renewable resources and increase system resilience.[110] Since a circular approach contrasts sharply with most of today's linear industrial operations, this transformation will require significant changes in government policies, corporate behaviour and consumption patterns.[111]

A fully circular economy is possible, but requires profound changes in materials management and mindsets

The circular economy could unlock US$4.5 trillion of additional economic growth. This requires eliminating the idea of 'waste' and recognising that everything has value.[112] It is estimated that adopting value-retention processes – remanufacturing, refurbishment, repair and direct reuse – could reduce new material needs by as much as 80 to 99 percent and reduce GHG emissions in some sectors by 79 to 99 percent.[113] However, the transition to a circular economy entails tremendous challenges when it comes to materials management.[114] It requires complex and coordinated efforts at the local, national, regional and global levels,[102] as well as technologies and business models based on longevity, renewability, reuse, repair, upgrade, refurbishment, capacity sharing and dematerialisation.[115] Beyond processes and technologies, it requires a mindset shift from linear to circular thinking.

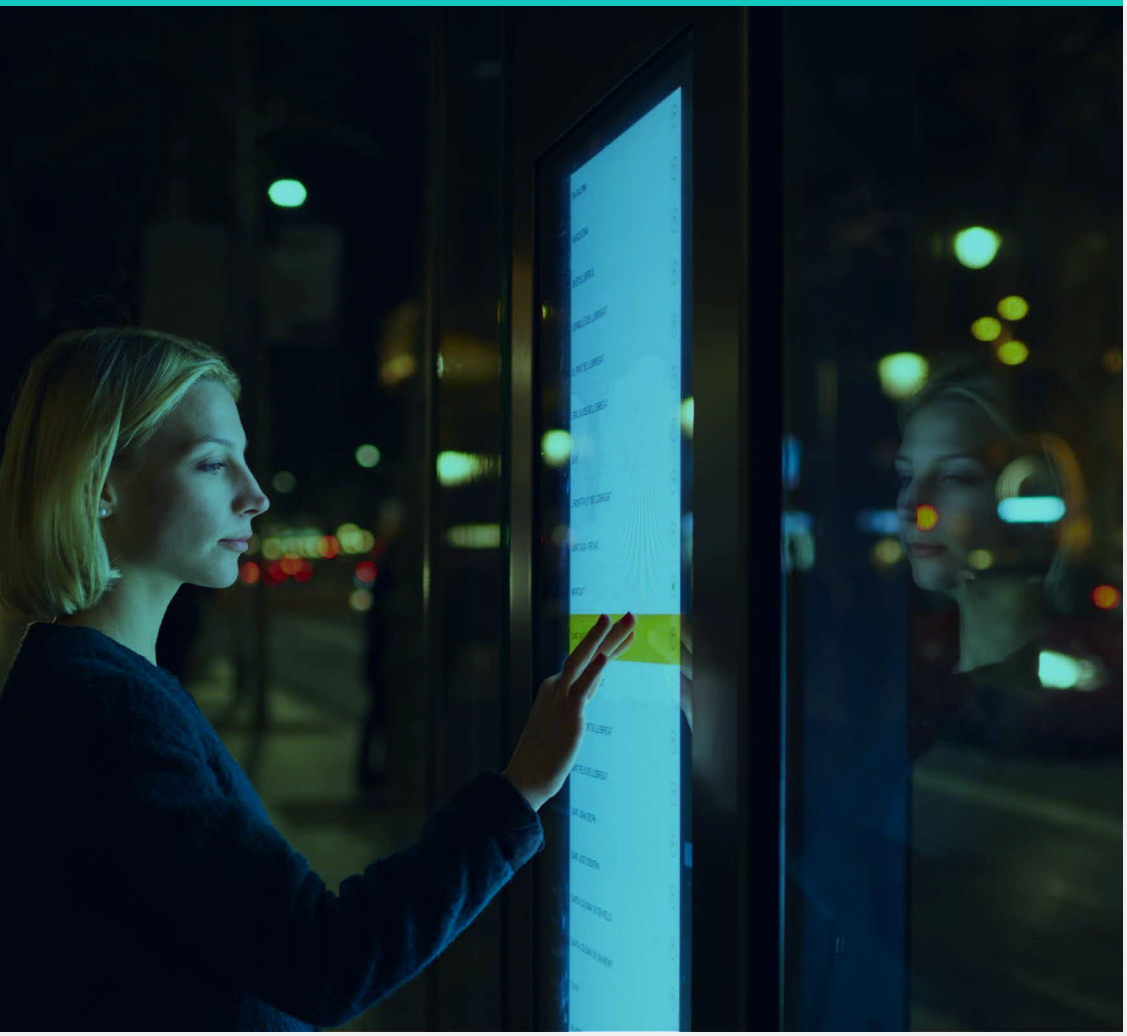
Research shows that a fully circular economy is possible, but only in the long run. Factors that contribute to this include that 1) we are still building up the stock of rare materials, predominantly rare earth metals, 2) emerging economies are still developing their built environment and infrastructure, 3) there are insufficient technical capabilities to fully close the loop and reduce the losses of material quality and quantity during recycling processes, and 4) the availability of some minerals we can continue to extract without major implications for the immediate ecosystems which they support are abundant.[116]

Significant progress is needed to move towards a more circular economy

Research finds that our world is only 9 percent circular and the trend is negative.[117] Over the past 50 years, humanity's ecological footprint – a measure of our consumption of natural resources – has increased by almost 200 percent.[14] Total demand for resource stocks, such as biomass, fossil fuels and many metals, is expected to reach 130 billion tonnes by 2050, compared to 50 billion in 2014, resulting in a 400 percent overuse of the Earth's total capacity.[115] This widening gap between sustainable resource availability and demand will lead to rising costs for materials, energy, water and land and can contribute to extreme volatility in commodity markets, as well as augment economic and social risks associated with supply chain disruptions.[115] Research finds that if circularity principles are adopted, the consumption of primary materials, measured by car and construction materials, real estate land, synthetic fertiliser, pesticides, agricultural water use, fuels and non-renewable electricity, could drop as much as 32 percent by 2030 and 53 percent by 2050.[118] In the EU alone, a switch to the circular use of steel, plastics, aluminium and cement can cut emissions from heavy industry by more than half by 2050.[119] In mobility, food and housing, a circular transition could reduce CO^2 emissions by almost half by 2030 and by over 80 percent by 2050, compared to 2012 levels.[118] Moving to a more circular economy is also crucial for achieving the Paris Agreement. While the climate policies already in place and committed to under the Paris Agreement can deliver a reduction of 11 to 13 billion tonnes of CO^2, circular economy strategies could contribute to closing half of the emissions gap between current commitments and the 1.5°C pathway in 2030.[120]

[IX] GICS Industry groups

Digital transformation



Digital technologies have a transformative impact on many industries

Digitalisation affects all aspects of our lives – how we work, how we live and how we consume – and is considered one of the main drivers of current changes in the business world.[121] Digital technologies have become a key enabler of fundamental innovation and disruption[122] and can have a transformative impact on many industries, disrupting existing markets and sectors, while creating new ones. A number of industries are particularly well-positioned to drive this transformation. These include: software & services; technology hardware & equipment; semiconductor & semiconductor equipment; telecommunication services; and media & entertainment.[X]

Digital technologies can enable and accelerate the achievement of all SDGs

Although digital technologies have low visibility in the 2030 Agenda, they greatly influence outcomes on the SDGs.[123, 3] Research finds that ICT development has the potential to accelerate social and economic development, as well as improve environmental protection, and is highly correlated with faster and more efficient progress on all 17 SDGs:[124]

However, the positive potential associated with the application of digital technologies is paralleled by abuses and unintended consequences[125] that negatively impact progress on the goals.

The digital revolution blurs lines between the physical and digital worlds

The Fourth Industrial Revolution is characterised by a range of new technologies that are fusing the physical, digital and biological worlds, impacting all parts of the economy and society. These technologies are changing how we live, organise, work and communicate and generating enormous potential for society and business.[6] A wide range of new products, applications and services has emerged over the past decade, forming a growing ecosystem of technologies and applications. Key components of this ecosystem include 1) the Internet of Things (IoT), comprised of devices and objects whose state can be altered with or without active involvement of individuals, 2) big data analytics, which allow the processing and interpretation of large amounts of data to uncover patterns, correlations and other insights, 3) blockchain, which is a digital database of transactions that is shared across a network of computers, and 4) artificial intelligence (AI), which can be understood as machines performing human-like cognitive functions, such as learning, problem solving and pattern recognition.[126] AI is considered to be an especially pervasive feature of this Fourth Industrial Revolution, as it automates skills that previously only humans possessed.[127]

While the digital revolution brings many benefits, it could also result in greater inequality

According to The World in 2050, "perhaps the greatest single enabler of sustainable development in the coming years would be the digital revolution".[3] According to some estimates, the digital economy was worth US$12.9 trillion in 2018, equalling 17 percent of global GDP.[128] Other estimates suggest that digitalisation could deliver as much as US$100 trillion in value to business and society over the next decade.[129]

While the digital revolution can bring positive and accelerated change in many areas, there can be also negative unforeseen and unintended consequences if adequate attention is not given to the rules, norms, standards, incentives, institutions and other mechanisms needed to safeguard the equal distribution of benefits created by new technologies.[44] As a result, the transformation could cause greater risks and inequalities where the benefits of the digital age are asymmetrical,[130] reinforcing exclusion and the concentration of wealth and resources.[131] Currently, many digital technologies can either support or threaten the attainment of the SDGs, depending on how they are applied and how equitably their benefits are spread.[3] For example, while automation, AI and robotics promise enhanced economic growth, they can also exacerbate inequalities in and between countries and contribute to unemployment, as more jobs are performed by machines.

Important challenges in the digital economy also relate to security and privacy. Digital technologies have given governments and companies new possibilities for surveillance, tracking and monitoring,[125] and there is growing concern over how companies use this data to predict, control and shape behaviour.[132] Together with other controversial issues related to digital technologies, this erodes

people's trust.[123] If the Internet and digital technologies are perceived as distrustful, more people will withdraw or refuse to participate in the digitally connected world.[133]

The digital revolution can and should be shaped in ways that maximise benefits for innovation, growth and social prosperity,[134] while addressing challenges created by this transformation, particularly in regard to jobs, skills and trust.[126] Harnessing the positive potential of the digital transformation for society and business, therefore, requires a political-economic system that supports beneficial innovation, while providing safeguards against potential undesirable effects.[135] This ensures that the benefits of digital transformation are fairly and widely shared.

We need to narrow the divides in access, skills, use and innovation to ensure everyone can reap the benefits

For digital technologies to benefit everyone everywhere, barriers in access, skills, use and innovation have to be mitigated. Narrowing the digital divide in Internet access and use is particularly crucial.[136] Currently, just over half of the global population uses the Internet. In developing countries, this proportion is significantly lower (45 percent) than in developed countries (81 percent). Moreover, in least developed countries, less than 20 percent of people use the Internet.[137] There are also significant inequalities in the use of ICTs within countries, mainly as a result of differences in digital skills, which are correlated with educational attainment, rurality, gender and age.[137] This digital divide means the offline population is unable to participate in and reap the benefits of the digital economy, further widening the gaps between those online and offline. Closing this divide is increasingly challenging, as the increase in people using the Internet is slowing at an alarming rate and much earlier in the adoption cycle compared to mobile phones.

There is also a significant divide between technology innovators who also own the related intellectual property and non-innovators. Innovators develop new technologies and benefit from the monetisation of these technologies, while non-innovators have to purchase the rights of use of these technologies, which is referred to as the 'innovation divide'. This inequity in innovation capacity, use and economic benefits will ultimately determine future digital divides while deepening current ones.[138] In addition, increasing automatisation and robotisation will likely replace humans in jobs across many sectors, further reinforcing inequalities between people with and without the skills needed in the digital economy.

There is also significant concern around the increasing likelihood of a security and trust divide, whereby users who lack the skills, knowledge and resources will be far more likely to become victims of cybercrime.[139] With the widespread growth of IoT devices and use of data generated by new technologies, addressing privacy, security and malicious use are particularly important, as is protecting fundamental freedoms and rights and potential issues of bias.[139]

[X] GICS Industry groups

Urban transformation

Business has a key role in the delivery of urban infrastructure and services

Growth and urbanisation often go hand in hand, and there is a robust relationship between per capita income and urbanisation.[140] Cities are economic powerhouses; they occupy only two percent of total land but generate about 80 percent of total global GDP.[13] For companies, cities offer important economies of scale, both in terms of consumption and production,[141] as the majority of people now work and live in cities. While the urban economy is increasingly driven by the private sector, the equitable provision of services and infrastructure remains a key responsibility of urban government.[142] Public-private cooperation is increasingly important for the development and management of infrastructure and the provision of public services.[143] Key industries that can support the sustainable development of cities include: materials; capital goods; transportation; software & services; telecommunication services; utilities; and real estate.[XI]

Sustainable development is increasingly linked to sustainable urban growth

Cities play a formative role in social, economic and environmental activity worldwide, making them well-positioned at a crucial point of interest to address opportunities and challenges to global sustainable development.[13] As the world continues to urbanise, sustainable development increasingly relies on sustainable urban growth, particularly in low-income and lower-middle-income countries where urbanisation is most rapid.[144] SDG 11 focuses specifically on making cities safe, inclusive, resilient and sustainable. Furthermore, over half of the SDG

targets include an urban component,[13] meaning that actions taken at the city-level have the potential to generate synergies and scale across multiple SDGs. It is estimated that business opportunities resulting from achieving the SDGs related to cities could be worth over US$3.7 trillion annually for the private sector by 2030.[145] Sustainable urban growth will have a remarkable impact on the following SDGs:

Urban development patterns should be transformed to ensure they are inclusive and environmentally sustainable and resilient

By 2050, the world's urban population is expected to nearly double, making urbanisation one of the most transformative megatrends of this century.[146] Sustainable urban development is socially inclusive, environmentally sustainable and resilient, and provides opportunities for all, as emphasised with the adoption of the New Urban Agenda in Quito in 2016.[146] Governments have a vital role to play alongside businesses and others in delivering these aims. Sustainable urban development requires that the benefits of urbanisation are shared, ensuring all have access to infrastructure and social services. A particularly strong focus is placed on the needs of the urban poor and other vulnerable groups regarding access to quality housing, education, healthcare, sanitation, decent work and a safe environment.[144] Key components that support this transformation are inclusive urban policies and regulations, sustainable planning and design, as well as municipal finance.[143] In addition, high connectivity and 'smart' infrastructure allow more people to connect to the services and opportunities offered in cities.[3]

The speed and scale of urbanisation puts significant pressure on urban infrastructure

Urbanisation is often recognised as the most enduring societal dynamic in human development and a key factor in socio-economic transformation.[3] Populations, economic activities, social and cultural interactions, and environmental and human impacts are increasingly concentrated in cities. The pace of urban expansion is disproportionate to population growth, with cities growing at one and a half times the rate of the global population over the last 20 years.[13] Cities' infrastructure will likely not grow in tandem with their needs,[143] which places immense pressures on existing urban infrastructure, human resources and financial systems. While cities are powerhouses of economic growth and can function as catalysts for inclusion and innovation, many cities currently face challenges in meeting the needs of their residents, including those concerning housing, transportation, energy and other infrastructure, as well as employment and basic services, such as education and healthcare.

It is estimated that US$4.5 to US$5.4 trillion is needed globally to fill the urban infrastructure finance gap.[147] However, more compacted, connected, coordinated and impact-focused approaches to urban infrastructure could also result in significant economic savings,

amounting up to US$17 trillion.[148] With over 60 percent of the places that will be urbanised by 2030 yet to be built[147] and investments in urban infrastructure ranging up to 100 years,[149] decisions made today will influence the development and functioning of urban systems for generations to come. The future of cities depends to a large extent on the way urbanisation is managed. Many see an important role for 'smart-city approaches' that make use of opportunities from digital technologies to address key challenges in urban mobility, housing, clean energy and waste management – a market that is expected to grow to over US$750 billion by 2020.[150]

As the population is increasingly urban, the management of urban growth is becoming more important

Currently, 55 percent of the world's population (4.2 billion people) reside in cities, which is anticipated to increase to 68 percent by 2050.[144] The combination of urbanisation and population growth could add another 2.5 billion people to urban areas by 2050.[144] Moreover, about 95 percent of urban expansion is expected to take place in the developing world,[151] with the highest projections occurring in East Asia, South Asia and Sub-Saharan Africa where correlating push and pull factors are catalysing rural depopulation.[3, 13]

With an increasing urban population, managing existing urban development challenges is becoming more and more urgent. Already today, nearly one billion people reside in slum conditions,[152] which are characterised by overcrowding, inadequate housing and sanitation facilities, and health and tenure insecurities.[153] Without intervention, one-third of the urban population could lack access to affordable housing by 2050.[154]

Unsustainable cities also incur significant environmental costs. It is estimated that at least two billion people do not have access to regular waste collection, and many cities are failing in proper collection and environmentally sound treatment and disposal of waste,[13] an issue which must be addressed urgently, as solid waste generation is expected to double by 2025. Additionally, cities are responsible for 60 to 80 percent of global energy consumption[155] and account for 75 percent of global CO2 emissions, with transport and buildings being among the largest contributors.[156] If current standards continue, we could witness a 125 percent increase in urban demand for natural resources.[157]

At the same time, cities are most vulnerable to the effects of climate change. Over 90 percent of all urban centres are located in coastal areas, and an estimated 650 million urban dwellers will face serious risks from floods, rising sea levels, water scarcity, and ecological and economic change as a result of climate change.[158] This can push 77 million more urban dwellers into poverty and may cost cities US$314 billion each year.[147] Furthermore, poor air quality and high levels of pollution are a persistent issue for cities, with exposure to ambient air pollution resulting in 4.2 million deaths every year.[159] A significant geographical imbalance can be observed, with almost all cities (up to 97 percent) in developing countries failing to meet air quality guidelines, as opposed to around half (49 percent) in developed countries.[13]

[XI] GICS Industry groups

Financial system transformation

Financial institutions are key decision makers in the allocation and management of resources in support of the SDGs

Finance is instrumental to the SDGs. The financial system helps to mobilise and pool savings and investments, as it provides payment services that facilitate the exchange of goods and services, helps to diversify, transform and manage risk, and supports the creation of new jobs and enterprises.[160] Access to finance is often considered one of the prerequisites for sustainable and equitable development.[161]

Over the last 30 years, the size of the financial services sector has grown enormously.[162] Although the world economy is highly decentralised and operates among millions of enterprises all over the world, financial resources are concentrated and managed by a much smaller number of financial intermediaries. This makes financial institutions key decision makers in the allocation of resources. In addition, financial institutions are well-positioned to influence companies' long-term performance through effective stewardship that promotes positive change. These institutions, therefore, have a distinct role in the global economy when it comes to allocating and managing resources in support of the 2030 Agenda. In turn, in order to limit its own exposure to social, economic and environmental risks, the financial sector has a strategic interest in ensuring that the SDGs are met. In essence, the financial system serves as a key enabler of the other systems described in this paper. Industries that have a particularly strong influence in guiding this system transformation include: banks; diversified financials; and insurance.[XII]

Closing the SDG investment gap requires significant amounts of private finance

Financing the SDGs requires an estimated US$5-7 trillion per year,[163] with most recent estimates indicating US$6 trillion per year on average. Advanced economies represent US$1.5 trillion a year, while emerging markets and developing economies represent US$4.5 trillion.[164] Despite the encouraging momentum for investments in sustainable development, financial flows towards the SDGs remain modest relative to the scale of investment needs.[164] It is estimated that worldwide SDG financial flows add up to US$3.5 trillion per year, with US$1.6 trillion coming from public sources and US$1.9 trillion from private sources.[164] Mobilising additional private finance will be essential, as the projected public sector financial flows appear to be insufficient to deliver the goals at the necessary speed and scale. Scaling up and redirecting private capital towards the SDGs and climate investments through bond markets, public equity markets, bank lending and direct investments in projects and companies can contribute to closing this gap, benefiting all 17 SDGs:

The financial system needs to integrate the full costing of positive and negative externalities

According to the UNEP's Inquiry into the Design of a Sustainable Financial System, a sustainable financial system "integrates sustainability into its operations, including the full costing of positive and negative externalities that sustainability implies, leading to a reorientation of the flow of resources toward more inclusive and sustainable activities".[165] However, according to the Inquiry, finance remains disconnected from sustainable development for three main reasons[166]. Firstly, policies and prices in the real economy do not fully account for social and environmental costs. Sustainability factors are often treated as an externality and are not incorporated into companies' balance sheets. Therefore, the cost of capital rarely reflects the true cost of business activities across equity, debt and insurance.[167, 168] Secondly, fiscal resources are insufficient to drive long-term finance and cost-effective encouragement of sustainable investments. Thirdly, rules governing the financial system do not ensure that financial decision-making takes social and environmental risks and opportunities into account. Specifically, more clarity on fiduciary duty in law and guidance is needed to better align investments with long-term value creation.[166] Ambiguity regarding interpretations of fiduciary duties – duties that exist to ensure that those who manage other people's money act in the interest of the beneficiaries[169] – have often been a barrier to integrating environmental, social and governance (ESG) factors into investment processes and engagement activities, despite the fact that a large body of evidence shows that sustainability plays a role in a business'

long-term success.[167, 169] In addition, many people are increasingly conscious about the products they choose to buy based on their values and the impact of those products on our society, whereas few people fully understand how their investments impact society and the environment.[170] Consequently, "too often the role of the individual in the financial system is forgotten or disregarded by those who direct much of the flows of finance".[167] Aligning investments with beneficiaries' preferences and values could ensure that finance serves the 'real' economy and the needs of individual people.

Short-termism in financial markets is a major obstacle to achieving the SDGs

Recent years have revealed a large range of vulnerabilities and weaknesses surrounding our current financial system. We have experienced how fragility of financial markets can rapidly spread to the wider economy and negatively impact sustainable development. The trend towards greater levels of 'financialisation', defined as "the increasing role of financial motives, financial markets, financial actors and financial instructions in the operation of the domestic and international economies",[171] has resulted in a system whereby financial returns increasingly arise from transactions that are disconnected from long-term value creation in the real economy.[166] In addition, it has led to a focus on the short-term rather than the long-term, broad-based changes required to meet the SDGs.[172] Findings by the McKinsey Global Institute suggest that pressure to deliver strong short-term results has increased over the past five years, leading to excessively short-term horizons in companies' strategic planning.[173] A compounding problem is that much of the information available on companies' environmental and social impact is itself short-term and inadequate (e.g. due to lack of comparability) for financial decision makers to assess and fully understand these factors.[174, 175] In order to appropriately assess and price risk and opportunities, investors, lenders and insurance underwriters need better and more consistent disclosures of standardised measures that are linked to impact and that go beyond a single-minded focus on financial capital, also taking into account how and to what extent an organisation affects the wider context that supports or threatens its value creation.[176]

Despite existing challenges, investing in the SDGs represents enormous opportunities, while the cost of inaction will be huge. A study by the IFC shows that if 21 emerging market economies deliver on their national climate commitments between now and 2030, climate-smart investment opportunities in these countries could represent around US$23 trillion.[177] On the other hand, extreme outcomes, like warming of 6°C, could result in almost US$14 trillion in present value losses to current manageable assets for the private sector.[178]

We need to increase the share of sustainable finance and access to finance

Despite the significant growth in sustainable investing[179] and innovations that advance sustainable finance, it remains challenging to accurately quantify and compare progress across financial markets.

This can partly be explained by inconsistencies in definitions, taxonomies and methodologies, as well as data gaps across time, geography and asset classes.[180] It is estimated that sustainable investments now account for around one-quarter of professionally managed assets globally. However, the most applied sustainable investment strategy worldwide is still negative/exclusionary screening, meaning that certain sectors, companies or practices are excluded from a fund or a portfolio.[181] This is often considered the first step in the finance sector's impact journey.[164] Other examples also show that there remains a significant opportunity to ramp up sustainable finance. Currently, less than one percent of global bonds are labelled green, and less than one percent of holdings by institutional investors are green infrastructure assets.[175] However, more research is needed concerning the actual impact of sustainable finance to better define what sustainable finance means and understand its effects on environmental and social outcomes. This will require building analyses and measures that allow investors to monitor the real impact of their investments.

Moreover, the benefits created by financial intermediation and markets are not being spread widely enough. In addition to improving the resilience of our financial system and steering capital towards economic activities that support the future we want, while moving away from activities that do not,[168] there is an urgent need to increase more people's access to the financial system. While financial inclusion is rising rapidly, mainly driven by financial technology, almost one-third (31 percent) of the global adult population does not have an account at a financial institution or through a mobile money provider.[182] Financial inclusion is considered a building block for poverty reduction, providing opportunities for economic growth and development.[183] Financial services can help people escape poverty by facilitating investments in their health, education and business. These services also provide solutions for retirement saving and help people anticipate and respond to financial shocks.[182]

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Conclusion and next steps

The ways in which many of our current systems function are deeply flawed, causing environmental and social upheaval and degradation on a massive scale. If we want to change this trajectory and have a chance at achieving the SDGs, then we need to act collectively with an urgency and focus that is unprecedented. We need to tackle the current challenges faced under these seven systems and put the world on a more sustainable, resilient and inclusive path.

The seven systems transformations outlined in this paper form the bedrock of WBA's benchmark methodologies. The scope of these transformations is vast, and success will depend on the actions of all stakeholders involved. Business, in particular, has a key role to play in enabling and driving these transformations. For this reason, our benchmarks focus on assessing corporate action on sustainability and measuring the private sector's progress.

We envision a world where competition drives performance and a company's success is determined by its measurable contribution to benefit society more broadly, beyond financial performance. First, we must move from awareness to aspiration, and then rapidly continue onto action and achievement. WBA aims to empower all stakeholders – from consumers and investors, to employees and business leaders – with the necessary data and insights to take action and encourage sustainable business practices across all sectors. By publishing methodologies that can serve as roadmaps and relevant data on benchmarked companies, as well as equipping our Allies to act, WBA can enable companies to advance in their sustainability journey.

We will identify industries and keystone companies

For each of the seven system transformations, the next step will be to identify relevant industries. WBA will outline how each industry can impact the transformation, taking full account of the industry's positive and negative effects. Within each of the identified industries, we will then identify influential companies, also referred to as 'keystone actors'. Keystone actor is a term coined by researchers from the Stockholm Resilience Centre. These companies have a disproportionate influence on the structure and functioning of the systems in which they operate. The researchers ascribed the following characteristics to keystone actors[184]:

- They dominate global production revenues and volumes within a particular sector;
- They control globally relevant segments of production;
- They connect ecosystems globally through subsidiaries; and
- They influence global governance processes and institutions.

These characteristics will be translated into inclusion criteria for each of the transformations and applied across relevant industries. Based on these criteria, we expect to identify around 2,000 keystone companies for inclusion in the benchmarks to assess their impact on these transformations and the SDGs closest to their core business. This process is outlined in Figure 4.

Conclusion and next steps

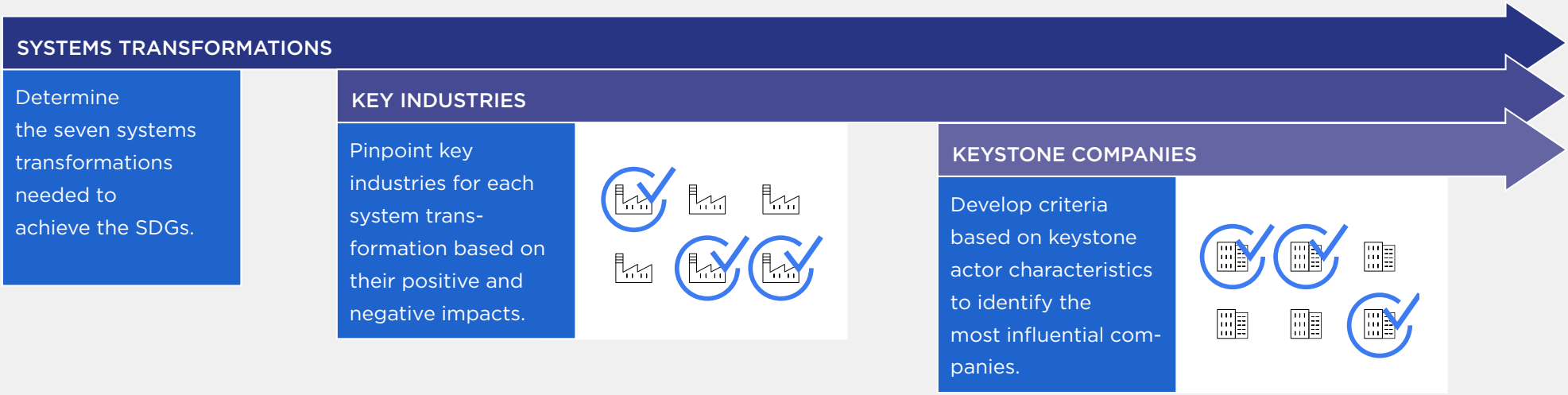

Figure 4: How we will identify keystone companies

Whereas some companies will be relevant across multiple systems transformations, the impact of other companies will be predominantly linked to a particular transformation. Focusing primarily on impact, WBA will consider both listed and non-listed companies (including state-owned enterprises and cooperatives) for inclusion in the benchmarks and will ensure that companies from diverse geographies are represented, especially those operating in developing countries.

If we want to achieve the SDGs, contributions from keystone companies will be vital. These companies can shift norms and practices and, therefore, drive sustainable change within a given system. The concentration of economic activity in these companies means they are able to exercise incredible influence over employees, suppliers, customers and political processes, depending on their jurisdictions.[185] They are often at the forefront of developments and investments within their sector and work with thousands of business partners across their value chains.

Due to these companies' systemic influence, their sustainability leadership is expected to result in cascading effects throughout the entire industry and global supply chains. By setting sustainability standards, creating incentives, driving innovation and developing

Conclusion and next steps

new business models, keystone companies can have substantial leveraged impact in driving the transformation towards more sustainable and inclusive systems. They can also demonstrate to sector peers that system transformation is not only essential for our common future, but also vital for business success.

In identifying keystone companies, WBA signals which companies can be catalysts for change and whose actions are vital for wider, systematic change. By developing methodologies that guide these keystone companies through the transformations and assessing the progress of thousands of companies, we hope that their aggregate impact will result in systemic change. If successful, benchmarking could play a major role in accelerating the necessary transition towards a sustainable future that works for all.

We welcome you to be part of the transformative change the world needs to see. This is our invitation to you. Please join the conversation.

Conclusion and next steps

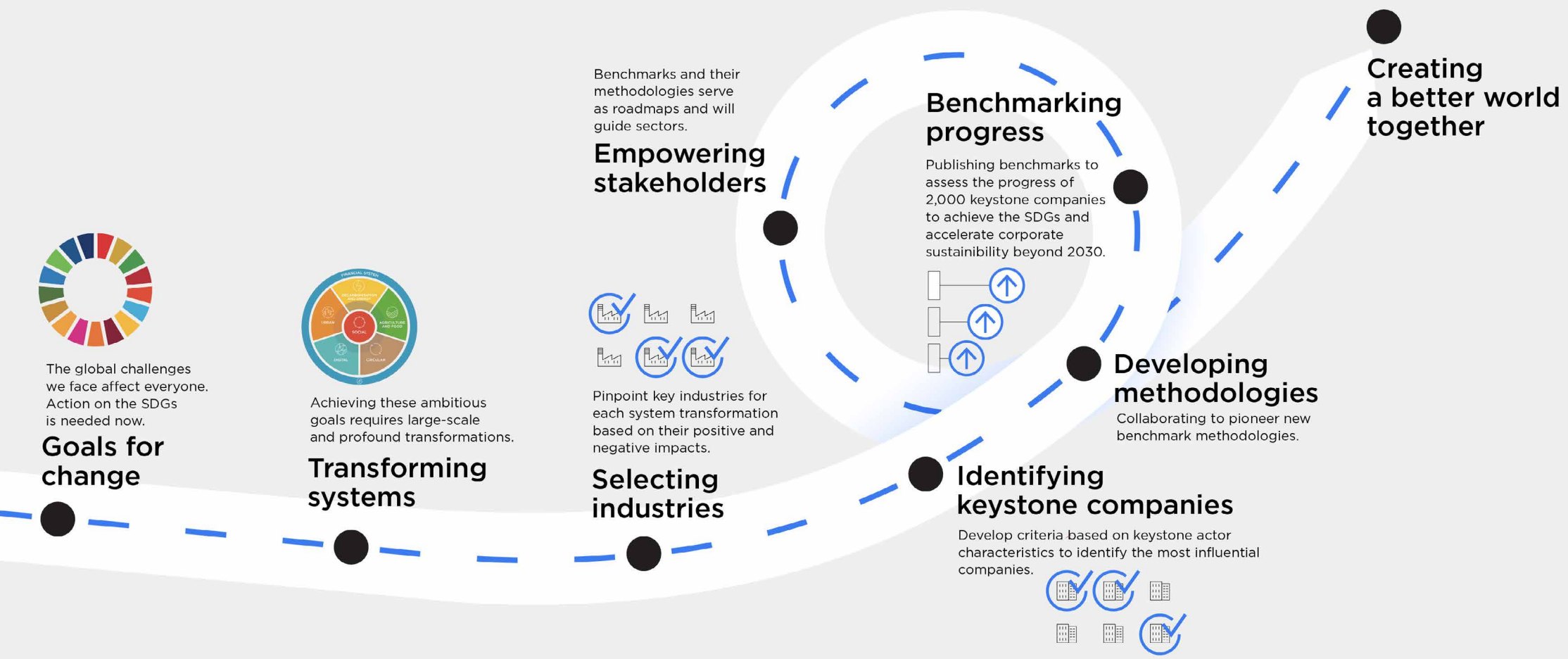

Figure 5: WBA strategy to build benchmarks for a better world

About the author

Lisanne Urlings is WBA's Lead Researcher. She leads WBA's organisation-wide research projects including WBA's systems transformations framework and Theory of Change. She is involved in the development of various WBA benchmarks, particularly focusing on methodology development and translating research and input from stakeholders into clear metrics and actions for companies.

Lisanne strongly believes business can and should drive and accelerate the positive change needed to put the world on a more sustainable and inclusive path and achieve the SDGs. She is passionate about research-based efforts that promote and drive this long-term change and impact.

Prior to joining WBA and Index Initiative, one of WBA's founding partners, Lisanne worked at the Access to Medicine Index where she was responsible for methodology development and analysis and coordinated the development of company scorecards. She holds a MSc in Global Business and Stakeholder Management from the RSM Erasmus University.

If you have any specific questions or ideas about the seven systems transformations, please contact **Lisanne Urlings** at l.urlings@worldbenchmarkingalliance.org. If you have questions or would like to be involved in one of the benchmarks, please contact the benchmark leads below.

Meet the benchmark leads

Dan Neale | Programme Director Corporate Human Rights Benchmark
dan.neale@corporatebenchmark.org

Danielle Burt | Lead Gender Equality and Empowerment Benchmark
d.burt@worldbenchmarkingalliance.org

Ido Verhagen | Lead Food and Agriculture Benchmark
i.verhagen@worldbenchmarkingalliance.org

Lourdes Montenegro | Lead Digital Inclusion Benchmark
l.montenegro@worldbenchmarkingalliance.org

Vicky Sins | Lead Climate Action Benchmark
v.sins@worldbenchmarkingalliance.org

Richard Hardyment | Research Director
r.hardyment@worldbenchmarkingalliance.org

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