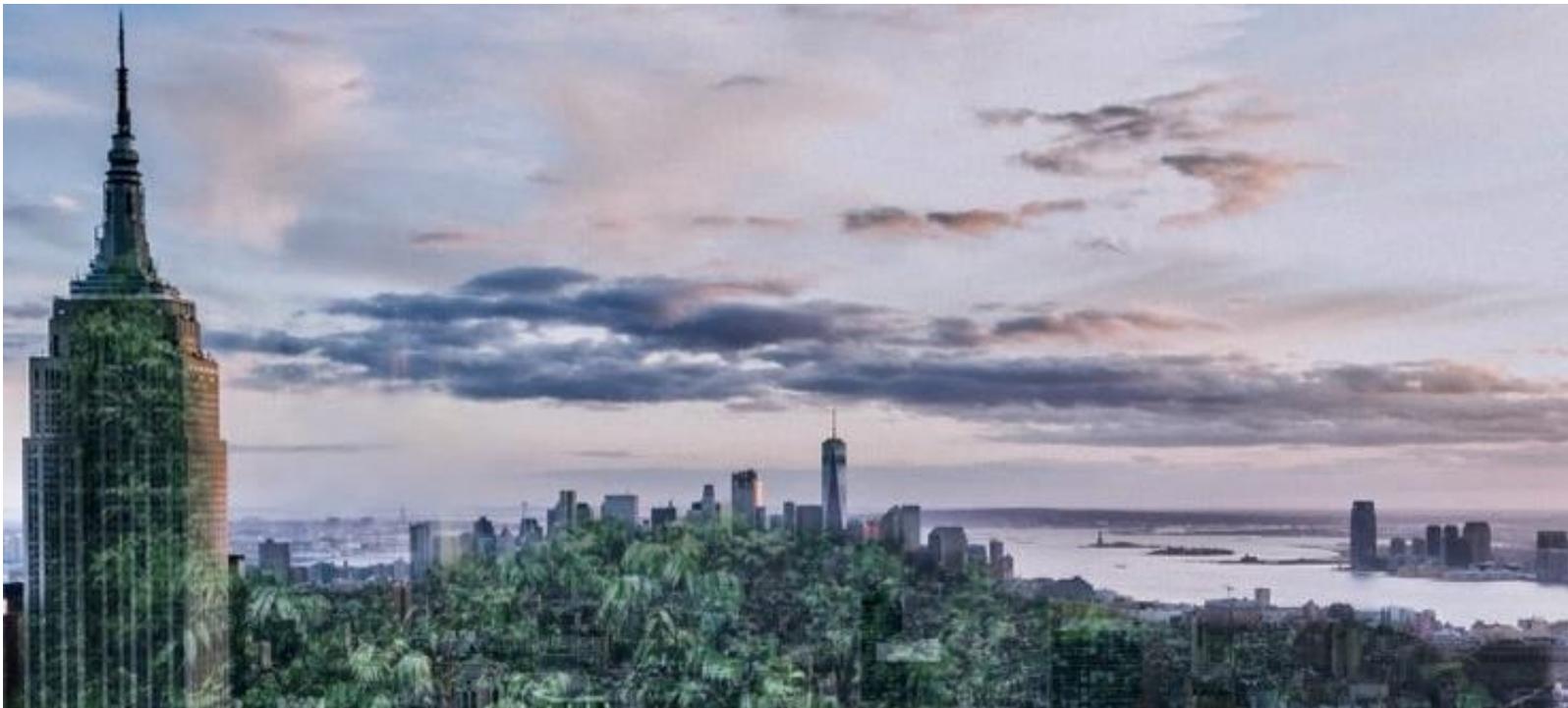


VII. The Way Ahead: Capitalism for a Sustainable Future



Despite a clear case for radical change in the face of existential threats to the world, the momentum and energy of the world's current industrial model continues to dominate. Great corrections in other periods of major change in history have been accompanied by conflict that changed the world order, and today too conflict has arisen and so security has quickly taken precedence over progressing other issues. Contrary to popular belief, these are all demonstrations of the effective working of today's system of capitalism, having evolved to address and fund business as usual, the urgent issues arising, and the future. The SDGs have been squeezed out in the process since they were not a design feature of the system. So, what does it take to incorporate the SDGs into the system of capitalism, manage an inclusive transition to the future while keeping stability and security?

This report points to c.US\$450 trillion of liquid capital stock globally, and c.US\$100 trillion of capital flow, which implies there should be enough capital to fund the SDGs by 2030. However, despite sustainability funding reaching unprecedented levels last year, based on the estimated requirement of US\$135-176 trillion and current financing trends, the

shortfall is estimated at US\$103-135 trillion, and with security needing c.US\$60 trillion, the SDGs are unlikely to be achieved by 2030.

Over and above the calls to fund the status quo, “business as usual”, there are three other categories of calls being made on the world’s capital: one is to fund the SDGs, the second is to fund on-going security and event risks, and the third it to fund the future.

Funding the path to a more secure sustainable future will require humankind to combine its ingenuity, its capacity for compassion and its desire for profit, out of necessity. In today’s

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connected world the populations of the most economically and technologically advanced countries whose quality of lives continue to improve due to new breakthroughs cannot afford to neglect the less fortunate. The consequences of such continued inequalities will range from mass migration into the rich nations to climate costs that will threaten the survival of all. And these will not necessarily be exacted as part of a negotiated transaction but as a natural

consequence of a global lack of levelling up. The consequence of not using the SDGs to level up the world is likely its levelling down.

While success in funding the SDGs, security, and the future is not guaranteed, neither is failure inevitable given the increasing ambition of mankind, evident in its endeavors to reach Mars, realize quantum computing, and create scaled fusion energy.

The answer lies in a far more radical multi-stakeholder approach to capitalism one that incorporates the SDGs as a critical pillar of progress. However, there is no consensus globally on how to achieve this transformation. There are two extreme views, in one view, the way ahead would require austerity, sharing and gradually repairing the world for the damages of the industrial era to arrive at a more sustainable world where people are more balanced with nature. Another view posits that society needs to make the breakthroughs that allow it to solve its constraints and arrive at an era where the solutions and returns are far greater than the industrial age has delivered, and the science allows mankind to correct for the damages to the ecosystem of the past.

1. Starkly different assumptions on the transition to the future

A longstanding body of thought, beginning with the influential 'Limits to Growth' report by the Club of Rome in 1972, posits that there are limits to growth on the planet and that without significant changes in expectations, lifestyles, and asset consumption, the world's population and industrial capacity is at risk.

However, to date, the exponential growth in knowledge that has driven accelerating breakthroughs since the Industrial Revolution has not only allowed the world to avoid a Malthusian crisis resulting from exponential growth in a world of finite resources, but it has also provided extraordinary possibilities for the way ahead. However, many now argue that climate change and biodiversity loss, indicates a moment of reckoning given they pose the existential risks that have long been predicted.

However, it is uncertain whether the moment has arrived to step off the growth escalator or whether knowledge and invention can solve the world's challenges before it is too late.

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These world views may well be irreconcilable. Since the SDGs were launched, alignment has not been realized between stakeholders that believe growth must stop, and those that believe the world can solve the issues without stopping. The SDGs set the goals and did not require one or the other to be the path ahead, it left it to member states to decide what was best for them. However, given the under-funding

of the SDGs, it may be time to determine the reconciliation of these views.

Unless the world can quickly come together to agree to solve its challenges with the blueprint and modus operandi for doing so, the calls for the world to stave off a global catastrophe by retreating into preservation and mitigation mode will rise. In this scenario, mankind's footprint would need to be dramatically reduced to a sustainable level until the breakthroughs that allow renewed growth are achieved.

1. A world in retreat: preservation and mitigation mode

Of the myriad changes that drive a world in preservation and mitigation mode, one thing that separates it from today is a conscious decision to limit the use of fossil fuels, reducing the footprint of man on the planet by restrictions on the use of resources and therefore activity.

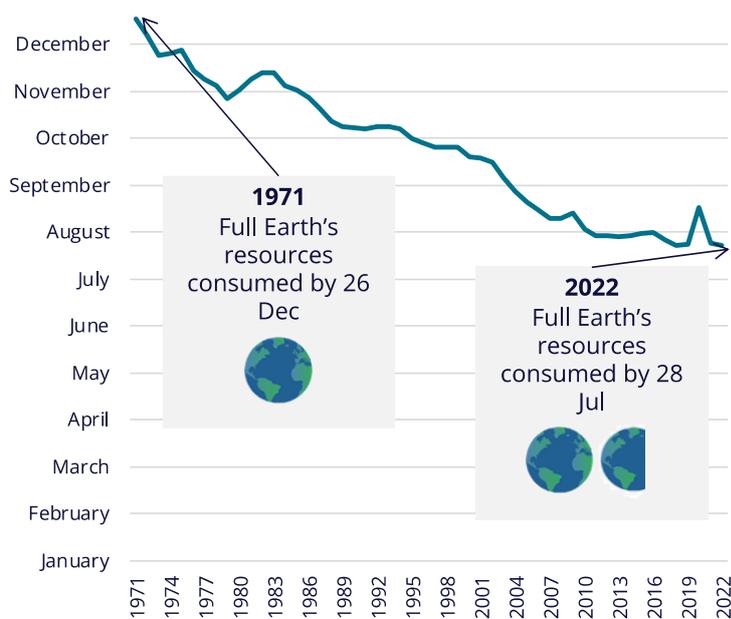
The world that results from such a scenario is closer to the world in COVID lockdown than the one before it or after it for most countries, only it would be far more dramatic since it would roll the world back to before 1971, when the world consumed c.40% less of nearly everything than it does today

Figure 1: 'Over-Using' of the Planet – How Many 'Earths' Are We Consuming?

Over-Using' of the Planet – How Many 'Earths' Are We Consuming?

Earth Overshoot Day:

How Long Does it Take to Consume One Earth?



How Many Earths Would it Take if Everyone Lived Like...



Source: Earth Overshoot Day, National footprint and Biocapacity Accounts 2022 Edition

The implications for how the world would need to work are severe:

- **Energy.** Global energy consumption would need to drop by over 60% from over 10,000Mtoe to under 4,000Mtoe, assuming the world cannot quickly transition to a fully renewable mix of sources and less energy intensive economy.
- **Industry.** The reduction in global output would concentrate in global industrials, which are disproportionately resources intensive. Global industrial output which contributes c.28% of global GDP would need to be reduced by c.75% (assuming that industrial resource intensity is twice that of services on average), reducing GHG emissions by c.15% as a result. Cutting services by 40%, would reduce GHG by a further c.10%.
- **Materials.** There would likely be a continuing dependence on process innovation to allow mining of key natural resources in a manner which allowed for greater yield, inevitably with greater risk and cost.
- **People.** Individuals in advanced economies would need to drop their consumption levels by c.60-80%, assuming current levels of resource intensity.

- **Travel.** There would need to be a near total ban of almost all air travel and cars, including electric cars which remain reliant on a grid still largely powered by fossil fuels, reducing global GHG by c.15%. Travel and leisure would need to transition to virtual models as a result.
- **Finance.** The contraction of global consumption and production would need to be managed to avoid a global debt crisis and negative real returns, which would likely be possible once global wealth reduces proportionately to the drop in global output, wiping out c.US\$350 trillion of global assets.
- **Planet.** We are currently calculated to consume 1.75 planets worth of resources, a shorthand for our current level of consumption and development. The adjustment would aim for a retrenchment below one planet.

Unless the world can quickly innovate at scale across all the above areas, the only way it can return to living within the means of the planet to maintain its ecosystem is by cutting back. Who should cut back is bound to be difficult to agree. However, such a retreat would require the developed world, which is the biggest consumer of the planet and its resources (to live at America's level, we would need 5.1 earths) to take the most pain. Under this scenario, there would need to be sufficient agreement that the rich countries do not stop trading and funding the poorer nations.

In all circumstances, the SDGs would move further from achievability for both the rich and the poor given the level of austerity across all aspects of human life across the world that a strategy of preservation would imply.

The austerity required to "reset" the world to a sustainable trajectory is not one that the developed world is currently prepared for in any of the many walks of life of the individual; not as a consumer, family household, voter, nor as an employee, employer, entrepreneur, CEO, or head of state (democratic or autocratic) or any of the other roles that the vast majority of individuals in the world play.

The simple walk through above of the preservation scenario for reducing humankind's footprint is one that is unlikely to be successfully implemented without mass unrest if there is an available alternative, and perhaps even if there is no alternative.

However, given the world's current level of progress on addressing global challenges, some level of retreat will be all but inevitable, and will likely only be achieved at a significant cost in environmental damage, economic destruction, and human suffering. And the longer the world waits, the greater this cost will be.

Given the level austerity across all aspects of human life across the world that a strategy of preservation would imply, the SDGs will likely move far further from achievability for both the rich and the poor

2. A world in growth: moving rapidly to a future model

To avoid the scenario laid out above, the world would need to rapidly invest in a series of technological breakthroughs that can fundamentally reset current trajectories of ecosystem damage and create a step change in human progress. Breakthroughs in energy technologies have been critical in achieving such step changes throughout history.

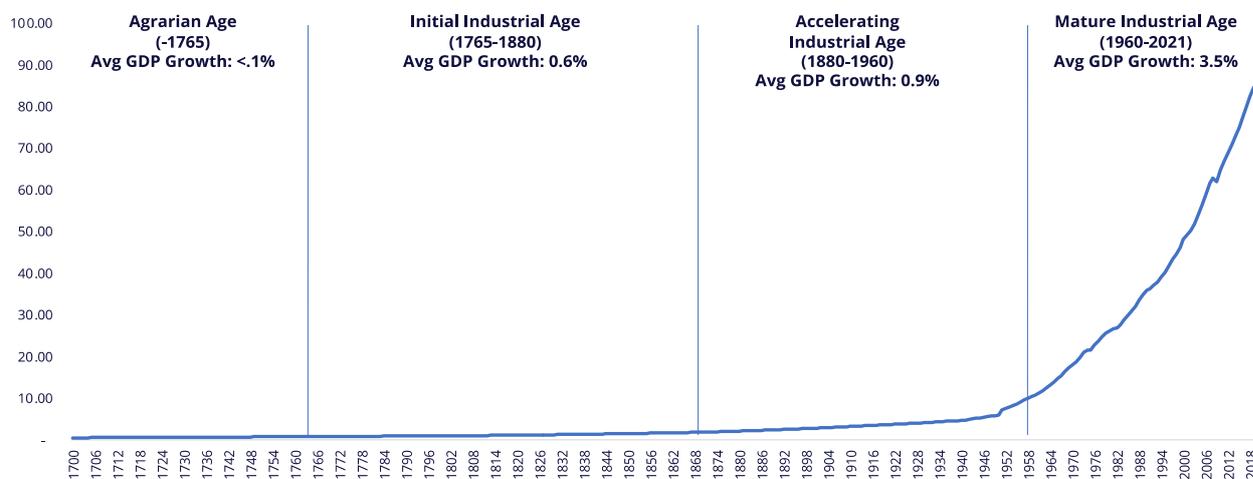
For millennia up to the Industrial Revolution, the growth in global economic output was largely in lockstep with global population growth, with human (and animal) labor being the primary sources of energy for work. The first step change came with the development of the steam engine in the 18th century, unlocking the power of coal, driving growth in real economic output (and energy consumption) locally at first, but increasingly on a regional and global level too. The second came with electrification in the late 19th century which provided a series of functional advantages in industrial and residential energy use that created a further step change in growth (and global coal demand). The third shift came with the transition from coal to oil in the middle of the 20th Century, ushering in the apotheosis of the Industrial Age due to the ubiquity of global oil supplies and the plethora of oil's use cases.

To avoid having to cut back to save the planet, the world would need to rapidly invest in a series of technological breakthroughs that can fundamentally reset current trajectories of ecosystem damage and create a step change in human progress.

Accelerating growth in the Industrial Age saw global GDP increase more than threefold between 1765-1880, nearly sixfold between 1880-1960 and nearly eightfold between 1960 and the present day.

Figure 2: Historical Nominal Global GDP 1700-2021

Historical Nominal Global GDP in US\$ trillion - 1700-2021



Source: Adapted from World Bank, A. Maddison

Just as the industrial era was based, and ultimately built on fossil fuels, the next era will require unlocking a new energy source, one that is abundant, clean, scalable, and highly cost-effective. The theory goes that such an energy source would have the potential to drive the growth and wealth creation necessary for the world to address its pressing challenges without forcing it to accept unacceptable trade-offs.

Just as in previous eras, the initial period following the discovery or exploitation of a new energy source would likely only see a moderate increase in global output, while the

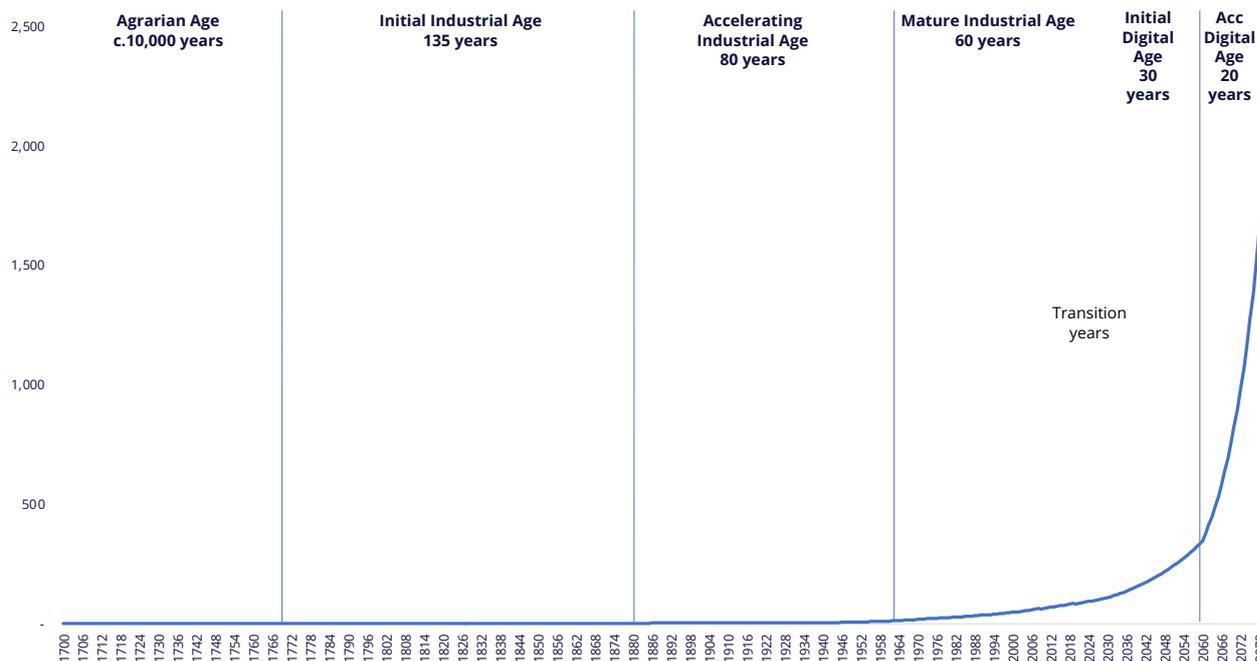
A new clean, abundant, and more 'functional' energy source breakthrough is the driver of the next era ... Applying Moore's Law to the growth of the Industrial age on the Digital Age, the world would rapidly progress through changes leading to a staggering growth in global output during the 21st

technology is refined and scaled, and its use cases are developed. However, this period would quickly be followed by one of rapidly accelerating growth, as practical breakthroughs and innovations in energy exploitation make the new source a viable replacement to nearly all other sources. Given the accelerating rate of technological progress, the world is likely to progress through the Digital Age much quicker than it did the Industrial Age, whose initial phase lasted c.115 years, and its second phase 80

years. Applying the principles of Moore's Law as a proxy for the increasing rate of technological innovation to these phases compresses them significantly, so that the world progresses through the first two phases of the Digital Age in 30 and 20 years, respectively, leading to a staggering growth in global output during the 21st Century.

Figure 3: Global GDP Growth 1700-2080

Actual and Projected Global GDP Growth 1700- 2080 in US\$ trillion



Source: Adapted from World Bank, A. Maddison, Capital as a Force for Good Initiative

Of course, the initial phase can only begin when the first fundamental breakthrough is achieved. Until then, the world will continue to remain in a period of transition, dependent on Industrial Age technologies whose ability to deliver continued sustainable growth has been all but exhausted. During this transition period, in which we are currently steeped, growth is delivered largely by marginal improvements in productivity, countries around the world share less and compete more, ignoring the plight of the developing world and failing to address pressing global challenges as a result. Until the global breakthrough to the Digital Age is accomplished, the world would continue on what is ultimately a decaying orbit that takes it closer and closer to the preservation and mitigation mode it is desperately seeking to avoid.

In this transition period, in which we are currently steeped, growth is delivered largely by marginal improvements in productivity, countries around the world share less and compete more, the developing world is not helped materially, and global challenges remain largely

However, once achieved, the changes to the world wrought by the growth and development in the Digital Age are likely to be staggering. Conceptualizing the world at the end of the first phase is still fairly straightforward. The US\$350 trillion of GDP by 2060 implies an average GDP per capita globally equal to that of countries like Italy or South Korea today, (although in practice countries would still have GDPs in a wide range even if the SDGs are all met given the inevitable unevenness of exploitation of new resources).

Imagining a world in 2080 with nearly US\$2 quadrillion in GDP however is another matter entirely. To envision what such a future might look like, it is worth considering the likely building blocks of that future civilization:

- **Energy.** New energy sources that replace carbon, with fusion and its derivatives being the most likely near-term prospect for commercialization, while other fundamental alternatives are explored. Solar, wind, thermal in its current form would not be “functionally” superior in the way coal was to manual power.
- **Technology.** Advances in artificial intelligence, computing and data sciences that remake all aspects of life and work. culling irrelevant industries, and creating entirely new ones
- **Industry.** Increasing automation, the use of AI and abundant near-free energy allows for nearly limitless scaling that drives down the marginal costs of production towards zero.
- **Materials.** Breakthroughs in material sciences replace the need for the extraction of finite natural resources with sustainable and cost-effective “synthetic” alternatives.
- **Finance.** The adoption of a pervasive distributed form of capitalism that drives mass inclusion, while renewing and reinventing global trade without the need for centralized control or financial intermediaries.
- **People.** People empowered by technology with access to opportunities regardless of time, space, geography, demography, gender, race, or income levels.
- **Reality.** The metaverse creating a shift in the human paradigm itself through the widespread adoption of virtual, augmented, and mixed reality platforms
- **Space.** The leveraging of space for access to new resources, exploration, and new territories to live in, will drive massive innovations of their own along the way.

A civilization based on these breakthroughs would be as different from today's as the industrial one was from the agricultural civilization that preceded it, and if these breakthroughs were realized today, rather than over the decades to come, they would also address the SDGs, as long as the necessary institutions to ensure a just transition are in place.

These breakthroughs require not only bold investments in R&D but also significant investments to commercialize, scale and to manage the disruptions that they will create by making large parts of existing industrial sectors (and their people) obsolete. While this funding will compete with the SDGs in the short run, they will become self-funding given the growth and value generation that accompanies such a period, and they will likely be critical

to fully meeting the SDGs in the long run given the impact of the technologies they enable and the resulting uplift in global growth and wealth.

However, the time to make the pivotal breakthroughs, energy being critical, that realize this scenario are not known and in the meantime the world continues to burn through its ecosystem getting closer to the existential threat. So, this scenario cannot be relied on as the only option. The answer, as one would expect, is a path between the extremes.

3. A managed transition requires managing parallel streams in a balanced fashion

Today, we sit in the gap between two great eras in history, for which there is no transition plan. Beyond the transition, the human footprint scales far beyond anything seen thus far.

Achieving a successful transition, one that is sustainable and just, in terms of inclusiveness and the fundamental right to a dignified existence for people, other species, and the environment, requires global collaboration, careful thought, and measured judgements to

Now is exactly the time when the blueprint, with the potential to change the world's trajectory is most needed, much like the Marshall Plan did for a post war Europe in similar circumstances as the world is in today

maximize the overall benefit and to minimize transition costs.

In some ways, the timing for development and execution of such a blueprint couldn't be worse, amid global economic stagnation, the exhaustion of public finance, rising inflation, falling

international cooperation and the threat of further geopolitical conflict. But today is exactly the time when the blueprint, with the potential to change the world's trajectory is most needed, much like the Marshall Plan did for a post war Europe in circumstances similar to today's.

The blueprint for such a shift would reconcile the two extreme scenarios above and would need to combine the obvious and the radical, and constitute:

- I. **Preserving and Mitigating Damage to the Planet.** A successful transition depends on the world arresting further damage to the global ecosystem, preserving finite resources, protecting biodiversity, reducing pollution and waste, and reversing environmental degradation.
- II. **Achieving the SDGs as a Basis for Further Growth.** Meeting the SDGs is a prerequisite for managing an efficient and just transition to the future, levelling up less developed countries, particularly driving mass inclusion provides a more level playing field for the world to transition in a coordinated and equitable fashion.

- III. **Launching High Impact Initiatives that Drive Step-Changes in Meeting the Goals.** The transition to such a future would need three requirements to play out: scaled and bold solutions, far higher-level risk taking, and large-scale mobilization of capital to investment in these solutions.
- IV. **Building and Funding the Future.** At the same time, the world will need to fund and achieve next generation energy, communications, information, and materials technologies that can provide a step-change in global progress, investing heavily into fundamental research and its translation into applied technologies.
- V. **Managing the Dislocations of the Transition.** All transitions, on some level, imply shifts in resources and opportunities, creating dislocations that risk leaving some stakeholders behind. The world will need to proactively manage the economic, political, and social dislocations that will accompany the transition, including significant investments in climate change adaptation, given that the world will likely face potentially severe local disruptions, even if the Paris goals are met by 2050.
- VI. **Efficient Maintenance and Preservation.** During the transition, the world still needs to “keep the lights on”, maintaining its current infrastructure and operating existing systems, paying pensions, delivering healthcare, operating and regulating markets, and feeding, clothing, and providing for its nearly eight billion people in an efficient manner.
- VII. **Ensuring Peace and Building Resilience.** A smooth transition to the future can only be accomplished in a peaceful manner, with the global community working together to build global resilience to withstand the inevitable event risks, crises, and setbacks that emerge, as well as to benefit from any breakthroughs that materialize

This is a daunting set of streams of activity. In history, these may have happened without humankind assuming it needed to manage such change. The force of enterprises of the day – commercial and military, primarily – drove large societal changes. Therefore, the philosophical question is important on whether such complex world-defining transitions are ‘architected’ or whether they are best left to ‘occur’ through a series of events that seem accidental or driven by individual change-makers.

On some level it is undeniably true that the world’s issues could be solved top down, While the US, China, and the EU together account for less than half the world’s carbon emissions, they account for nearly 70% of global economic output and the same share of global net wealth. If the leaders of these three powers could agree on a common timeline and a credible path to Net Zero, with common standards and consistent incentives and penalties at the national level, the rest of the world would likely quickly follow or be encouraged to follow their lead, and the achievement of 2050

The thing about today's existential drama is that it can be solved if the three leaders of US, China, and the EU - who account for nearly 70% of global economic output and over half of GHG – agree to do

Net Zero would move into sight. However, we do not appear to live in a world where such agreement and execution is possible, for now.

The alternative bottom-up approach, a multi-stakeholder effort of individual actors aligned on the goal and broadly moving in the same direction. This alternative has only become feasible recently due to globalization and the interconnectedness it has delivered, which allows stakeholders to coordinate the executing the changes required.

Managing these changes to a blueprint and modus operandi seems a clear requirement for a broad multi-stakeholder aligned effort, one that populists have left the world ill-suited to pursue, but one that is required, nonetheless.

Such an effort would need to go well beyond the alignment of member states that the UN secured as signatories to the SDGs. Each stakeholder group would need to align and play their role to create the system of capitalism that can include, protect and enable the transition to build the future:

- **The aware responsible and empowered individual.** The individual owns and mandates 62% of the world's money and consumes 78% of the world's products and services needs to play their role in defunding damage and funding progress, without which the change will not be followed through by those that receive their capital.
- **The government setting the rules of engagement, incentives, and penalties.** The governments that own and mandate 38% of the world's money and consume 22% of the world's products and services need to play their role providing the incentives and rules that allow other stakeholders to invest, innovate and act boldly in pursuit of shared objectives.
- **The financier of bold solutions, to big issues, taking risk, for agreed profit.** The finance industry that oversees 90% of the world's liquid assets needs to play its role in developing new markets, products, and business models to reshape the global flow of funds.
- **The SDG mission-oriented enterprises.** Enterprises that contribute over 70% of the world's total economic output, and effectively process most of the resources consumed globally, need to play their role to protect the world including aligning their strategies to the SDGs, reducing their footprints, while investing to create radical solutions for the future.
- **The driver of the world into the digital age.** The information technology sector, which is emerging as the largest driver of global economic growth and development, needs to play its role in driving the global digitization of communities, governments, and enterprises to drive a step-change in productivity and the nature of value creation.
- **The scientists that break the grip of the energy and resources of the industrial age.** The science and research community, which spends over US\$2 trillion annually on

innovation and discovery, needs to play its role in delivering both the initial incremental technologies as well as the fundamental breakthroughs in materials, energy, transportation, and information processing that will facilitate the transition.

Such a level of multi-stakeholder alignment has the chance to steer the world through the storm, and manage a complex transition to a more peaceful, prosperous, and free world.

The world faces great multi-faceted social, economic, and political challenges today. The temptation is to ignore these and focus on the rivalry that defines an exclusive view of the world, seeing neighbors as enemies and defining “them” by their differences. Meanwhile, the temperature rises, consumption and production pumps fossil fuel waste into the air, and more and more people in both developed and developing nations enter poverty.

The ingenuity that created the greatest achievements of history cannot save those that ‘have’ if they do not solve this situation. This requires every stakeholder group to make a conscious decision to change and work together to push the wheels of the system towards a sustainable, secure, and superior future. This is only achieved with unity, and so rejection of those that divide is a pre-requisite for a peaceful transition.

There are breakthroughs to be made and a new era to be built, so mankind is at one of the most critical times in history, in the transition of eras when new civilizations are built. The future will be built through ingenuity beyond anything seen thus far, financing beyond the apparent means, and practicing generosity towards each other beyond what has been exhibited; a worthy endeavor for the world at this point.