# LAST OPP RTUNITY

# FOR A 1.5°C FUTURE?

Tipping points created by COVID-19 responses

Dennis Pamlin, November 2020



NET-ZERO COMPATIBLE INNOVATIONS INITIATIVE



The Net-Zero Compatible Innovations Initiative is one of the activities in the global Mission Innovation Action Plan for 2018 – 2020, which aims to accelerate the development and deployment of innovative solutions that can help tackle climate change.

The purpose of the initiative is to identify and support solutions (including technologies, products, services and business models) that are part of a net-zero development path. Examples include both more incremental solutions and more disruptive, such as the use of virtual meetings to displace business travel; replacing a fossil motor vehicle with non-motorised/ virtual mobility; or offering an advisory service to help companies move from business models based on selling products to offering access (dematerialised when possible).

So far, the climate challenge has primarily been approached as a problem where the focus is on reductions of emissions by companies, countries and cities. Most tools for measuring and reporting, as well as incentive structures, have therefore been developed under a reduction perspective. Negotiations and media ask for reduction targets, investors want to know how much companies emit, reporting frameworks help companies and cities to keep track of their emissions.

There are many reasons for this, as discussed in Module One. Critically, initiatives and organisations were created before the impacts of the fourth industrial revolution and the scope and scale of the reductions needed in society were understood; and because the mandate of many initially involved in the climate discussion was to deal with the laggards in the corporate sector. **This resulted in a situation where companies, cities and countries were viewed as problems and the best they could do was to reduce their emissions to zero. When zero was not possible this approach resulted in offsetting.** 

To view companies, cities and countries as sources of emissions is however, only half of the equation. An innovation approach provides the opportunity to focus on the solutions the world needs and how companies, cities and countries can provide these. With the fourth industrial revolution and new business models, it is also becoming increasingly counterproductive to only ask companies, countries and cities for reductions as this will undermine many disruptive innovations and ignore solution providers.

Instead of starting by asking stakeholders how they will reduce their emissions, it is time to identify low-carbon leaders by asking what solutions they can provide. Such an approach can accelerate the uptake of both individual solutions as well as transformative system solutions that require new clusters for implementation.

The existing reduction tools are important as they allow tracking of emissions from companies and cities. They can also help in formulating targets for certain emission reductions, and help in risk management, identifying cost reduction opportunities and supporting policy making that focuses on the emissions from the operation of organisations. Such work must continue and be strengthened.

However, tools for measuring and reporting, as well as incentive structures, are also needed for solutions and solution providers. In this area there has been far less consistency. There is a need to understand which solutions are compatible with a net-zero development path and how to avoid high-carbon lock-in.

The approach and methodology outlined in this initiative has therefore been developed to provide a robust and coherent way to measure, assess, and compare the current and potential impact of innovations that help reduce greenhouse gas emissions in society and contribute to a net-zero development path. Such a framework has the potential to support greater levels of innovation, as well as unlocking growth and new revenue opportunities for the innovations, necessary to address the challenge of climate change and achieve the ambitions of the Paris Agreement.

# LAST OPPORTUNITY FOR A 1.5°C FUTURE? Tipping points created by COVID-19 responses

**The End of Business as Usual when Changes in Habits, Structures and Perspectives Converge** A white paper by Dennis Pamlin based on 100+ cases from <u>www.covid-19-responses-climate.solutions</u>





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# **COVID-19 RESPONSES:** A historic opportunity

Pandemic – from the Greek pan ('all') and demos ('people') – is usually reserved for a disease that has spread worldwide. Pandemics require swift global coordinated action. In a matter of weeks, the threat of COVID-19 has resulted in actions that show that the world can act in unison and do things that only days earlier were seen as impossible.



## While much can be learnt from the responses to COVID-19 it is important to recognize that there are a number of important differences.

Like pandemics, climate change poses a global threat and for all practical purposes, climate change could be considered one of the most dangerous "pandemic" threats facing humanity

The responses to COVID-19<sup>2</sup> have created historically unique tipping points where small changes are likely to push the system into fundamentally different states. These tipping points could be our last opportunity to avoid catastrophic climate change.

We are faced with a choice to either accelerate new sustainable habits, develop new structures in support of a just 1.5 °C compatible transition and encourage new perspectives, or we can pursue business as usual and continue to undermine global sustainability.

HERACLITUS

	Before the COVID-19 outbreak, the world was on track to a 3 °C or more increase in
	average temperature <sup>3</sup> . Now the question is in
<b>y.</b> 1	what direction society will move. Sustained
	emissions will almost certainly result in
	catastrophic events and suffering that will make
	the COVID-19 situation pale in comparison. <sup>4</sup>
	Although COVID-19 has significant and horrible
	consequences, it is still very benign compared to
	even the least dangerous climate change.
	There is currently a tension between short-term

COVID-19 responses built on old development models, and the initiatives needed for global sustainability.

## "No man ever steps in the same river twice, for it's not the same river and he's not the same man."

Before COVID-19, the fourth industrial revolution together with new values, business models, and other macroeconomic trends were rapidly changing the world; but the overall trend was unsustainable.<sup>5</sup> Society should therefore **not** try to return to the pre-COVID-19 world. Three things from the pre-COVID-19 world makes a return agenda dangerous:





address global catastrophic



material goods even though

Clearly, we should not be asking "how can we go back to normal", but rather "how can we create a new sustainable society". Responses to COVID-19 around the world provide glimpses into possible futures - the best parts of a sustainable future as well as the worst possible outcomes.

During the COVID-19 social isolation, affluent people have had the means and time to reassess their ideas and discover new lines of productivity, a situation also evident in previous crises. During the Great Plague in London, for example, Isaac Newton, a man of means, used his time during

his social distancing to invent calculus, a period called Newton's annus mirabilis ("the year of miracles").6

Poor people, whether during Newton's day of presently, do not have the same opportunities as they must continue to work in less isolating circumstances, turning an already vulnerable situation into a possible catastrophic situation. Of the two billion informal economy workers (the most vulnerable labours) in the global workforce, 1.6 billion have suffered massive damage to their capacity to earn a living as the result of the COVID-19 outbreak.7

Society needs to provide short-term measures address the challenges facing poor people whi simultaneously addressing the tipping points that will influence society's trajectory for the coming decades.

Responses to the COVID-19 crisis by policy makers and business leaders have resulted in measures far beyond the normal and generally accepted – some good, some bad, and some difficult to assess. Collaborative COVID-19 responses have emerged that deliver solutions at a pace needed to address a global threat in ways that can inspire climate action.8 Howeve some COVID-19 measures have dramatically reduced personal freedom, making it harder to deliver what society needs and disproportional affected the poor.9

The responses to COVID-19 show the range of measures considered acceptable today by policy

## Differences in emphasis and assumptions between 1.5 °C pathways

## LED (... also P1)

Entry point for system transformation	strong emphasis on reducing ener demand
Scale of technologies and infrastructure	expansion of granular, small-scale energy end-use technologies
Need for carbon dioxide removal	<i>no</i> reliance on negative emission technologies
Type and emphasis of	technological, social, and business

innovation activities

Type of energy

services and lifestyles Linkages with sustainable

development

Economic growth and GDP per capita

**Essential nature** of system transformation

## rong emphasis on reducing energy emand xpansion of granular, small-scale nergy end-use technologies reliance on negative emission echnologies echnological, social, and business model innovations focused on ener services new digitally-enabled forms of ener service with low-impact lifestyles

synergies with other sustainable development objectives

medium economic growth with livi standards in global South converg to current levels in global North system transformation is sociotechnical with clear human dimension

s to	makers, business leaders, and the general public
ile	in the face of a serious threat. As climate change,
	by almost all relevant risk metrics, is a much more
	significant threat to humanity than COVID-19,
	we should investigate what we can learn from
	the COVID-19 responses and what should be
	done to ensure that the measures implemented
	to address COVID-19 do not undermine
Ý	global sustainability but support a broader
	sustainability agenda.
S	Many of the actions needed for global
	sustainability have been discussed by the
r,	Intergovernmental Panel on Climate Change
	(IPCC), specifically its 1.5 °C special report and
0	the Low Energy Demand Pathway (P1). <sup>10</sup> This
ally	pathway combines innovative climate action and
	delivery of the other global sustainability goals
	and should be used as a reference for all strategic
of	COVID-19 responses.
icv	

	<b>S1</b>	<b>S2</b>	S5 or SSP5 ( also P4)
gy	-	-	strong emphasis on decarbonising energy supply
	-	-	expansion of <i>large-scale</i> energy-supply infrastructure
	-	-	<i>massive deployment</i> of negative emission technologies
rgy	-	-	<i>technological and financial</i> innovations focused on energy-supply infrastructure
rgy	-	-	similar forms of energy service as today and resource-intensive lifestyles
	-	-	<i>trade-offs</i> with other sustainable development objectives
ing ging	-	-	very high economic growth with rising and converging GDP per capita
sion	_	-	system transformation is <i>technological</i> with business-as-usual trends in human aspects

# **COVID-19 RESPONSES:** Three categories of tipping points

The tipping points relevant for global sustainability and climate actions needed for 1.5 °C pathways fall into three categories of COVID-19 responses:



**Changes in habits: New** ways to address needs



**Changes in structures:** New macro-economic and system interventions



**Changes in perspectives:** New values and priorities in society

Changes in routines: New ways to address needs

COVID-19 responses have generated new ways to address society's needs: some new innovations need policy support and investments, but many others can use existing infrastructure, but could be further accelerated with supportive policy frameworks. Some innovations are magnitudes more resource efficient than previous solutions but have been held back by traditional thinking and outdated management models - that is, until COVID-19 forced people to innovate.<sup>11</sup>

Many of the responses are based on opportunities enabled by increased connectiv and digitalisation. Teleworking, virtual meeting digital collaboration, e-education, and m-heat these are just a few examples of resource efficient responses. Instead of only improving existing systems, these responses use new business models and digital infrastructures to transform societies capacity to deliver what is needed.

The digital infrastructure is not without problems, but the key drivers of negative environmental impacts from the digital infrastructure are not the smart solutions nee for a resource efficient future. The significant increase in use of digital services during the COVID-19 has not resulted in any relevant increased environmental impact. In most case network electricity usage has remained flat even though voice and data traffic has increased by 50% or more.  $^{\rm 12}$  Where impacts have been seen it has been due to increased streaming of



	videos, the main user of bandwidth. <sup>13</sup> Another
vity	reference for the energy footprint of the global
ngs,	ICT industry staying roughly flat while service use
th:	grows exponentially is a recent paper in Science
	by Masanet et al. 2020. They show efficiency
S	and scale gains have offset the phenomenal
	demand growth. <sup>14</sup>
)	
	COVID-19 responses have also resulted in
	less sustainable ways of delivering needs. For
	example, companies have used e-commerce to
	drive overconsumption. Apps such as Uber have
	accelerated replacing public transport with car
	transport. Other non-digital driven changes
eded	have also emerged. For example, the private
	jet industry has experienced a peak in demand
	due to the near total shutdown of commercial
	aviation, <sup>15</sup> and some supermarkets are using
es,	more unrecyclable plastic. <sup>16</sup>





The longer the COVID-19 responses last, the more significant the long-term impacts will be. In many cases, changing a habit takes about two weeks for the well-motivated and two months for the average-motivated.<sup>17</sup> Therefore, the tensions and tipping points will look different, depending on what habits different COVID-19 responses encourage and how long they last.

One of the COVID-19 memes provides a tonguein-cheek assessment of the capacity of companies to engage in digital transformation. The image lists different options for who is leading digital transformation in companies: CEOs, CTOs, or the COVID-19. The virus is selected as the leader of the digital transformation.<sup>18</sup> Although many companies had a digital transformation strategy

in place long before COVID-19, the focus of those strategies were seldom on transformation and global sustainability, but rather on improving existing systems with digital tools used to optimize existing systems. COVID-19, on the other hand, has moved true digital transformation from "interesting" to "a matter of survival" as people are forced to learn how to use new digital tools to conduct business, and also to interact and live socially. The latter have increased the discussion about the ethics around the algorithms that guide what we see and who we are interacting with.<sup>19</sup>

While new digital ways of working and meeting might have been the most discussed responses to COVID-19, this is only the tip of the iceberg.





Above is a need-based innovation overview.<sup>20</sup> Instead of a focus on sources of emissions (e.g can be classified. They can help deliver on coal, cement, cars, red meat) a need-based needs in better and more resource efficient approach focus on the need in society behind ways, improve the efficiency among enablers, the emissions (e.g. building/spaces, mobility/ or optimize major emitters. Many of the most access and nutrition/health) The needs listed transformative innovations address multiple above are linked to the areas with the highest needs, and sometimes make old ways of emissions and the structure on basic models supplying material and the business of major for human needs. In such a framework mobility/ emitters obsolete. access is not a need (unless the need for movement is intrinsic, such as hiking), but an To understand and support transformative enabler to get work done, get access to nutrition, system change, it is important look beyond etc. Even further removed from human needs individual responses to specific needs. That are categories like energy, cement, steel, glass, is, in order to understand how systems will be textiles. These can be part of sustainable systems, transformed, it is crucial to understand how multiple solutions and initiatives are designed but are often used to drive further consumption, and implemented and how these interact and or support inefficient systems that are no longer needed. Any assessment indicating increased strengthen one another. use should therefore be challenged so that the actual contribution to needs in society can be established.

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••		
-		

The numbers indicate how different innovations



# **MOBILITY/ACCESS**

## Mobility/Access

## 1. Virtual

## a. Teleworking/E-education.

Almost all workplaces have introduced measures to allow for teleworking. For many years, old habits have kept teleworking as a fringe activity. The Pew Research Centre describes the current situation as follows: 'COVID-19 may yet do what years of advocacy have failed to: Make telework a benefit available to more than a relative handful'.<sup>21</sup> Similarly, the idea of e-education might shift as the largest e-education experiment ever has been conducted during COVID-19 with numerous institutions expanding existing initiatives and rapidly launching new initiatives for 100s of millions of students worldwide.<sup>22</sup>

The savings from teleworking and e-education can be significant if implemented strategically with reduced physical space as this saving is often higher than the savings gained from reduced travel.<sup>23</sup> Making smart changes permanent could also significantly reduce emissions from underlying and supporting infrastructure (fewer roads, buildings, parking

spots, refineries, etc.), which often make up an additional 30% compared with the direct emissions from transport.<sup>24</sup> Combining smarter work and smarter education could be a key transformative driver for smarter, more creative, and more empathic cities with a focus on access instead of car-based transport systems. This change could also encourage virtual mobility together with an infrastructure supporting walking, biking, and physical meetings for creativity. Furthermore, this change could shift a city's focus to its citizens and their needs by encouraging creativity and social interaction as well as outdoor recreation rather than treating people as consumers whose value is measured by their shopping habits.<sup>25</sup>

A growing number of companies are already putting policies in place to ensure that teleworking becomes to new normal, and many more will allow for greater flexibility. Twitter was among the first to make teleworking permanent, something that an op-ed in The New York Times discussed in an article with the heading "Twitter Could End the Office as We Know It".26



The rapid introduction of these meetings and conferences have not allowed for optimal preparation and training, however positive responses to teleworking have been strong and increasing. A survey in the US indicated the following:<sup>27</sup>

"Fourteen percent of the survey's respondents worked from home before the **COVID-19** crisis. Respondents generally report being more productive when telecommuting. An additional 70 percent of the workforce has begun working from home in the wake of the pandemic.

Among respondents surveyed before April 25th, 20 percent said they got more work done at home, while 27 percent said they got less done. Among respondents surveyed after May 8th, 41 percent said they got more done and 13 percent said they got less done.

The effectiveness and appeal of working from home may have far-reaching consequences. While most respondents do not want to work from home all of the time, a plurality wished to work remotely 2-3 days a week."

These positive results should not be used as an excuse to ignore the significant challenges that exists, both due to lack of experience and lack of appropriate equipment. One of the most challenging during COVID-19 is the stressful situations many experiences what they have to work, provide childcare and take care of sick relatives all at the same time.

## b. Meetings/Conferences

Many meetings and conferences have been transformed into virtual ones as a response to COVID-19.28 Well-known organisations such as the UN, the World Bank (WB), the IMF, the EIB, and the G20 have moved many of their meetings and conferences to virtual platforms. The WB and IMF annual Spring meeting might set a new standard and be a symbol for new thinking regarding high profile international meetings.<sup>29</sup> However, it is unclear if the trend with dramatically reduced flying will continue post-COVID-19.30 If the full climate impact of flying becomes better known, and smart solutions for virtual meetings become more accepted, with more people looking for a better quality of life in a society where flygskam (flight shaming), i.e. if the wellbeing of future generations is seen as important and there is an understanding of disruptive climate impacts, a transformation is more likely.<sup>31</sup>

Counter to the need for transformative change is the trend among many, including leading consultants, who are now developing strategies for how to get back to the unsustainable "normal" travelling and meetings. The McKinsey article about the travel industry and COVID-19 "Make it better, not just safer: The opportunity to reinvent travel"32 does not even mention climate change and the need for reduced emissions. The total lack of understanding when it comes to climate change as one of the greatest challenges that must be addressed and instead focus in irrelevant distractions; is highlighted by the fact that the authors example of environmental action needed is "less-frequent laundering of sheets during each stay". Boston Consulting Group is no better and in their "The Post-COVID-19 Flight Plan for Airlines"<sup>33</sup> not even one of their five "Demand recovery scenarios" include anything about the need for reduced emissions. The fact that a consultant tells companies what they want to hear rather than what is needed for sustainability might not be new, but COVID-19 has made it clear that companies and governments that aspire to be a part of the solution, rather than part of the problem, might need to look beyond the old generation of consultants for guidance.



Counter to the need for transformative change is the trend among many, including leading consultants, who are now developing strategies for how to get back to the unsustainable "normal" travelling and meetings.

## 2. Physical

## a. Last mile solutions

Around the world, supply chain disruptions and need for home delivery have resulted in significant innovations. Bikes, autonomous electric vehicles, and even drones have been used to deliver food and medical services.<sup>34</sup> These solutions have been implemented in infrastructures built to solve other problems. For an accelerated uptake of smart solutions, the infrastructure needs to be updated with appropriate sidewalks, charging stations for robots, and landing spots for drones.

## b. Sharing

One of the most significant changes in the mobility system over the last years is the shift from private cars to a more optimized use of private cars. This is only an optimization of existing technologies, but has challenged the traditional automotive industry. These sharing services have been significantly disrupted by COVID-19. For example, Nasdaq reported that Uber withdrew its 2020 guidance due to the ongoing COVID-19 pandemic. The ride hailing service also warned that its net losses would increase from \$1.9 billion to \$2.2 billion.35



According to the market research institute Ipsos, in China individual car travel jumped from third to first as the preferred means of transport, whereas buses and metros dropped from first to third.<sup>36</sup> Post-COVID-19 car sharing and self-driving strategies will have to consider how these modes of transportation can reduce, or even eliminate, their contribution to the spread of pandemics.

## c. Decentralised production

As global value chains collapsed, the need to keep delivering goods to customers resulted in smart decentralised production innovations, including the use of 3D-printing and "maker spaces".<sup>37</sup> While the decentralised production initiatives have mainly been on a small scale and with varying quality, they indicate a significant potential for a future production and distribution system that could be fundamentally different compared with the current "global factory model".<sup>38</sup> Supporting structures with rapid certification and quality control have also emerged, further indicating the potential for a rapid shift to more local circular economy.39



## **BUILDING/SPACES**



## **Building/Spaces**

## 1. Dematerialised experiences

Many museums, concert halls, and other cultural institutions have accelerated their existing digital distribution channels and smaller creators have found new ways to reach out through virtual channels.<sup>40</sup> Instead of being an add-on to existing physical offers, digital distribution has become the main distribution channel.

## 2. Multiple purposes

Buildings have been repurposed and some hotels have been transformed into health facilities.<sup>41</sup> Digital fabrication is revolutionizing architecture, enabling the construction of complex and multi-functional building elements. Multi-functionality is often achieved through material reduction strategies such as functional or material hybridization.42

## 3. Reduced need

With many conferences and events cancelled, the need for hotel rooms and event space has been reduced significantly.43 Smarter workplaces with more telework could also significantly reduce the need for office space and instead use spaces that have a much higher utility rate.44

## Nutrition/Health

## 1. Mobile health

Several initiatives have been launched around the world to make it easier to track and treat patients remotely.45 In addition, several wearable and big data initiatives have been developed to better track pandemics and health.<sup>46</sup> Important initiatives that have not received enough attention include those aiming to protect people's privacy and rights.<sup>47</sup>



# **NUTRITION/HEALTH**

## 2. New food habits

As impulse shopping for food has declined and people seem to be desiring more heathy food, the WHO has taken the opportunity to recommend healthy foods and recipes, the majority being vegetarian, to set the stage for more healthy and more sustainable food habits.<sup>48</sup> Policy makers are likely to support more healthy food as obesity has been identified as a key factor during COVID-19. The most famous might be Boris Johnson who reportedly will "launch a renewed anti-obesity strategy in the wake of the coronavirus outbreak".49



# **NUTRITION/HEALTH**





## 3. Flexible exercise

With many gyms closing and the possibility of going outdoors having been limited in many places, digital indoor and outdoor exercise options have grown. Many people and organisations have responded to the WHO's call to stay fit.50

## 4. Mental health

Although rapid changes and new situations can provide opportunities for self-reflection and increased quality of life,<sup>51</sup> these changes can also decrease access to reproductive health, increase mental health problems, and even increase domestic violence.52





## Lifestyle

## 1. Lifestyles and values

Transformative system changes will not be delivered by individual solutions for individ needs. Such changes will only happen when critical mass of citizens wants to live in way that also impact the underlying infrastruct There are indications that the combined experiences during COVID-19 could result fundamental changes.<sup>53</sup>

A poll commissioned by the RSA in the UK indicated that 'only 9% of Brits want a tota return to "normal" after lockdown'.54 The poll also identifies significant changes to our relationship with food, family, and the environment since the lockdown began:55

- 51% noticed cleaner air and 27% notice more wildlife.
- 40% feel a stronger sense of local community and 39% feel more in touch with friends and family.

# **LIFESTYLES AND VALUES**

	<ul> <li>42% value food more, and 10% have shared food preparation or shopping</li> </ul>
e	duties with a neighbour for the first time.
dual	
n a	• 38% (more than 19 million people) cooked
ys	more from scratch, 33% (about 17 million
ture.	people) threw away less food, and 6%,
	(about 3 million people) tried a vegetable
tin	delivery service or ordered food from a
	local farm for the very first time.
	• 9% feel fitter and 27% exercise more.
al	although 36% are exercising less.
	However, as a group of BCG consultants noted
	'We must distinguish between temporarily
	postponed, accelerated, or disturbed
	consumption, and new, more permanent
ed	patterns of consumption'. <sup>56</sup> These "permanent
	patterns of consumption" will depend on
	how companies, governments, and others
	communicate and implement the new rules
า	and regulations.

Changes in structures: Macro-economic and system interventions

Key needs – e.g., nutrition, meetings, health, and education – have been provided in new innovative low-carbon ways during the COVID-19 crisis. However, these innovations are only relevant if they become institutionalised through changes in structures and result in significant long-term changes. The current unsustainable development path requires significant changes in the production systems and the use of underlying infrastructure: changes that require new innovative policy regulations and business model innovation.

To-date, the current economic responses from governments tend to focus on limiting the direct human and economic impact of the COVID-19 pandemic by supporting old structures and companies. Early assessment indicates that most responses so far do not support climate action, let alone a 1.5 °C Low Energy Demand (LED) compatible pathways.<sup>57</sup> In cases where climate integration is mentioned, or when different groups have called for climate to be integrated into the pandemic responses, the way climate solutions are presented tend to be based on a traditional supply-side approach rather than a system transformations approach.58 System transformations, however, are required for a 1.5°C compatible LED pathway.59

Four overarching challenges face stimulus packages:

- 1. Economic growth no longer has any clear link to a better society.<sup>60</sup>
- 2. Focus on getting as many people to work

per invested Dollar/Euro/RMB/Rupee often undermines smart resource efficient solutions.<sup>61</sup>

- 3. Automatization and AI provide opportunities to deliver on needs with very low labour and natural resource intensity.<sup>62</sup> A development path that requires using technology to address climate change in smart new ways require flanking measures to address extreme loss of traditional jobs, capital concentration and inequity. Universal basic income and similar redistribution mechanisms should be considered.<sup>63</sup>
- 4. Large and resource strong companies often protect the status quo and try to secure as much support as they can for themselves.

The result of these challenges is a lack of integration of even basic support for reduced emissions. If anything, there is basic support for more renewables, but not 1.5 °C compatible pathways. Few countries have integrated climate issues their COVID-19 stimulus/recovery initiatives any significant way: When the first assessmen was done by the IMF in April, only one country of the 193 countries, Estonia, mentioned clima change in its COVID-19 responses.<sup>64</sup> By 5 June 2020, only one more country, Finland, had mentioned climate change in its COVID-19 responses.<sup>65</sup> There is no lack of countries that climate relevant areas; five countries mention energy, more than ten mentioned industry, and more than 80 mentioned transport/mobilityrelated measures. In other words, many polici that significantly impact climate are addressed through COVID-19 responses, but they are seldom framed as climate measures in stimulu and recovery plans.66

In response to the lack of climate responses 19 EU environmental ministers have published ar article asking for sustainability to be integrate into COVID-19 stimulus and recovery plans.

Although such responses can be seen as positi these responses also indicate how far climate measures and sustainability are from mainstre economic policy-making that guides stimulus a recovery work. Clearly, environmental ministe have little influence on their own government as otherwise they would have made these demands directly to their own finance ministe



into	business ministers, and leaders of industry. In
IN ₊	addition to the environmental ministers, several
l ,	stakenoluers have called for climate action to be
y ata	hut most of those calls are vegue and do not
ale	but most of these cans are vague and do not
e	provide any guidance beyond the fact that
	mitigation and/or adaptation impacts should
1	be considered. When they provide concrete
list	guidance, they tend to be far from innovative.
ea	Many of the current recommendations for green
a	stimuli seem to be modified versions of an ILO
~~	This report multished four years before the Darie
es A	masting (COP 21) focused on three proces
u	meeting (COP-21), focused on three areas."
IS	1. Renewable energy, transmission,
	and storage;
5	2. Energy efficiency in buildings; and
1	
ed	3. Electric/low emitting cars and their
	supporting infrastructure.
ivo	These three areas are important but without a
vc,	$1.5^{\circ}$ strategy investments in these three areas
am	face significant risks of high-carbon resource
and	intensive lock-in and risk undermining smarter
ers	system solutions <sup>68</sup> Surprisingly almost no policy
5	recommendations relate to digitalisation and
-	changes in lifestyle linked to CO reduction in the
rs.	way that the IPCC have shown is necessary.
-,	







Before COVID-19, the fourth industrial revolution was recognised as a key innovation driver, but during COVID-19 many policy makers and business leaders seem to have shifted their focus towards earlier strategies that ignored the impact of digitalisation and business model innovation.

There is a widespread understanding that measures for long-term sustainability are needed. For example, the Climate Change Commission in New Zealand suggest a three-pronged approach for the Government's response to the coronavirus pandemic:<sup>69</sup>

- 1. Provide immediate relief to those in need;
- 2. Provide measures that stimulate the economic recovery in the medium term; and
- 3. Provide measures to manage the impacts on future generations in the long term.

Although such a three-pronged approach could help ensure that long-term measures are included in government policy, such strategies could be problematic. That is, if the economic recovery measures in the immediate and medium term undermine the positive long-term impacts by locking us into high-carbon production and consumption structures, the result would likely be a net negative. In the EU, vested interests, countries, and companies have been reported to block attempts to include basic support for renewables in stimulus packages:

[The Green Recovery Package] has not survived a barrage of lobbying by vested interests and pushback from member states still married to a more traditional energy mix, according to multiple sources following the green recovery's development.<sup>70</sup> The lack of integration of climate measures and concrete suggestions is also reflected in assessments of COVID-19 responses by think tanks and academics (see "Examples of Trackin of International Responses to COVID-19"). Ve few of these assessments include climate as a metric for assessing responses; when they do, almost only in a binary way.

One of the few papers with a more comprehensive climate assessment with a syst perspective was done by the Smith School of Enterprise and the Environment at the Univer of Oxford: "Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?".<sup>71</sup> This paper, however, did no even assess 1.5 °C compatibility, and even less Low Energy Demand (LED) pathway.<sup>72</sup> A major challenge for policy makers is that no 1.5 °C



	compatibility guidance or assessment exist for COVID-19 measures.
ng	Several papers refer to business-as-usual (BAU)
. i y	"neutral" reference is highly problematic. For
it is	example, the Oxford report classified most of
	the above measures (92%) as 'colourless' – i.e.,
	they maintain the status quo.73 These status
	quo measures should be called dangerous BAU,
tem	brown, or something similar to indicate that
	everything that is not actively contributing to the
sity	needed changes should be assumed to be part of
	the problem rather than neutral, the implication
	of the metaphor 'colourless'. This is especially
ot	true if the measures relate to important areas
sa	such as support for consumption and education,
r	two areas key for transformative system change

## Examples of organisations/experts calling for climate measures to be integrated and their focus

Below is a list of key documents from leading stakeholders and thought leaders. Many have written extensively on the subject and below is only the link to the most prominent/well known report/document.

IMF		
Managing Director's Opening Remarks at the Petersberg Climate Dialogue XI	Proposed Sustainability Checklist for Assessing Economic Recovery Interventions	Sustainable Recovery: World Energy Outlook Special Report
https://www.imf.org/en/News/Articles/2020/04/29/ sp042920-md-opening-remarks-at-petersberg- event	http://pubdocs.worldbank.org/ en/223671586803837686/Sustainability-Checklist- for-Assessing-Economic-Recovery-Investments- April-2020.pdf	https://www.iea.org/reports/sustainable-recovery
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SEIRENA IRENA		17 European climate and environment ministers
Call to Action in Response to COVID-19	An inclusive, green recovery is possible	European Green Deal must be central to a resilient recovery after COVID-19
https://www.irena.org/-/media/Files/IRENA/ Coalition-for-Action/Publication/IRENA_Coalition_ COVID-19_response.pdf	https://www.oecd.org/coronavirus/en/	https://www.climatechangenews.com/2020/04/09/ european-green-deal-must-central-resilient- recovery-covid-19/
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Energy Transitions Commission	Green Recovery Alliance	Climate Action Tracker
Seven key priorities to help the global economy recover	REBOOT & REBOOST our economies for a sustainable future	A government roadmap for addressing the climate and post COVID-19 economic crises
http://www.energy-transitions.org/sites/default/ files/COVID-Recovery-Response.pdf	https://drive.google.com/file/d/1j54QxE- QjhrEHjGb5LrKsHuDAKvv8LUq/view	https://climateactiontracker.org/publications/ addressing-the-climate-and-post-covid-19- economic-crises/
•••••	• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •
GREENPEACE Greenpeace	WWF WWF	Oxford University
Greenpeace's Priorities for Upcoming COVID-19 Stimulus Packages	Building Resilience	Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?
https://www.greenpeace.org/usa/news/greenpeaces- priorities-for-upcoming-covid-19-stimulus- packages/	https://wwf.panda.org/?364346/Nature-based- solutions-post-COVID-19-recovery	https://www.smithschool.ox.ac.uk/publications/ wpapers/workingpaper20-02.pdf
••••••	• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •
JRC: European Union	דיאיזאיז University of Toronto and דוא zürich ETH Zurich	IEA and IMF
Time for transformative resilience: the COVID-19 emergency	A COVID-19 recovery for climate	Sustainable recovery
https://ec.europa.eu/jrc/en/publication/eur- scientific-and-technical-research-reports/time- transformative-resilience-covid-19-emergency	https://science.sciencemag.org/ content/368/6490/447	https://webstore.iea.org/download/direct/3008
•••••	• • • • • • • • • • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • • •
COMMON Common Wealth	RethinkX Rethink-X	Breakthrough Energy
The Green Recovery Act	Rethinking Humanity (this report is included as inspiration for future reports support 1.5°C LED compatible and transformative system change)	FIT FOR NET – ZERO: 55 Tech Quests to accelerate Europe's recovery and pave the way to climate neutrality
https://www.common-wealth.co.uk/interactive- digital-projects/green-recovery-act#1	https://www.rethinkx.com/humanity-download	https://www.capgemini.com/wp-content/ uploads/2020/10/Net-zero-main-report-2020.pdf

In the post-COVID-19 world, two issues need to be addressed if we want to combine the COVID-19 responses with our climate change responses:

- 1. Most stimuli/recovery measures do not include any measures that support a lowcarbon development as the focus is on job creation and economic stimulus.
- 2. The majority of suggestions for low carbon measures focus on the pre-Paris agenda where any solutions marginally better than the existing situation are seen as "climate friendly". It is clear from the Paris targets and the IPCC's Special Report on 1.5 °C that marginal improvements are not enough. The most important question is not if a measure results in a less bad outcome, but if a measure is 1.5 °C compatible.

One major challenge is the assumption that current sectors should keep or even increase the number of their employees. This assumption makes it difficult to take advantage of automatization in many existing



sectors. Moreover, a workforce displaced by automatization could be re-trained for more important societal sectors such as healthcare, education, and new smart low-carbon solutions.

There are interesting initiatives supporting a smarter transition such as Spinning Reserve, a new incubator with the aim to turn jobless energy workers into entrepreneurs.74 Instead of viewing the wave of redundancies in the fossiland resource-intensive sectors as a problem, they could also be seen as an opportunity, as many of these workers are highly-skilled and could be part of a wave of new sustainable start-ups with the right support. It is important to assess what skills that workers from the airline industry, the oil and gas industry, energy companies, mining companies, steel companies, and cement companies have, and what education that is needed in order to make them relevant in a sustainable 1.5 °C compatible transition.

The table on the next page provides an overview of existing measures and recommendations created for the recovery/stimulus and how they relate to 1.5 °C compatibility.

Categorising recovery/stimulus measures and policy recommendations/initiatives/assessments based on target area, demands and 1.5 °C Low Energy Demand (LED) compatibility.

Most current measures by governments and companies are in Category 1 and 2. The majority of "green" measures that have been discussed belong to Category 3. All of these categories present significant challenges for a 1.5 °C compatible agenda.





Supporting a 1.5 °C Low-Energy-Demand agenda with a system and cluster approach, including business model innovation, digitalisation and new lifestyles

Category 6 Grade AAA





Green stimulus recommendations from many stakeholders only state that green/climate concerns should be integrated without clarifying what they are, making them impossible to assess. Five groups provide concrete suggestions. All of these can provide important contributions in their areas of expertise, but it is important to understand their focus:

Group 1 focuses mainly on centralized large-scale energy systems, with significant emphasis on the supply side and CCS. This group assume lower prices on single technologies as well as a global price of carbon. Usually, this group includes traditional energy organisations.<sup>75</sup>

5

- Group 2 focuses on (electric) mobility and energy efficiency in addition to large-scale renewable energy solutions. Often, this group includes traditional organizations with an overall policy agenda rather than a specific energy or climate focus.
- Group 3 focuses on system solutions and recognises new smart decentralised energy systems that are part of mobility and city planning. The system perspective tends to result in comprehensive policy recommendations for integrated solutions in energy and mobility. Usually, groups with extensive experience in energy/climate still emphasise supply side economics and rely on neoclassical economic models. These studies and recommendations sometimes mention the 2.0 °C or 1.5 °C goal, but the assessments are almost never aligned with a 1.5 °C pathway.

Group 4 focuses on what is needed for a 2.0 °C or 1.5 °C compatible development path. This group emphasises the supply side and is mainly focused on technology based solutions, but with an understanding of the need for new solutions. This group sometimes uses methods that include tipping-points and transformative system change, but still tends to depend on neoclassical arguments for how change can be achieved.<sup>76</sup>

Group 5 is still vacant, as no studies have presented a 1.5 °C Low-Energy Demand strategy for COVID-19 recovery. The stakeholders in this groups would focus on a transformative system change with a broader sustainability agenda that includes opportunities for digitalisation that the fourth industrialization provides. This group would also focus on solutions and what is needed. New lifestyles and values are key parts of the models that frame technological development. This group would likely include cutting-edge thinkers with the capacity to combine technical, economic, political, behavioural, and cultural understandings of change. Two recent articles that provide important insights include the article "Granular technologies to accelerate decarbonization, by Charlie Wilson, Arnulf Grubler, et.al and an article by Daniel Rosenbloom, Frank Geel et.al that outline a "sustainability transition policy". Both provide a number of relevant recommendations.<sup>77</sup> The report "Rethinking Humanity" by Rethink-X also features examples of how more disruptive pathways can be included.78



Based on the studies included in this overview, different characteristics seem to affect if different groups focus on the IPCC's 1.5°C LED pathway, any 2.0°C pathway, or do not focus at all on any long-term target.

Competence

If the competence is focused on the supplyside and large systems, the studies tend to be closer to Group 1. If the competence is focused on system solutions, digitalisation, and behavioural change, the studies are closer to Group 5.

• Models/theories

Studies that use neoclassical equilibrium models that focus on how legacy systems can change tend to be closer to Group 1. Groups that focus on sustainable zero-carbon outcome and best practices tend to be closer to Group 5.

• Participants

Studies dominated by established stakeholders from the fossil fuel industry and single technology experts tend to be closer



to Group 1. Studies by entrepreneurs, system thinkers, and experts in system change tend to be closer to Group 5.

## Political assessment/scientific focus

Studies that focus on what is currently seen as politically possible tend to be closer to Group 1. Studies that focus on what is needed to avoid dangerous climate change (i.e., 1.5 °C compatible development path) and the opportunities in the fourth industrial revolution tend to be closer to Group 5.

## • Lock-in/Zero carbon 2040/50

Studies that ignore the risk with high-carbon lock-in and the need for zero-carbon by 2040/2050 and just focus on any emission reductions tend to be closer to Group 1.79 Studies that focus on what is needed to reach zero carbon by 2040/50 and focus on the need to avoid high-carbon lock-in tend to be closer to Group 5.

All 15 studies assessed and categorized provide important knowledge, but understanding what kind of development path they support, what they include and exclude, is important for policy makers and companies.

In addition to documents addressing the specific link between stimuli and recovery measures and climate change, there are statements where more fundamental links between the current pandemic and our industrial production/consumption

systems are discussed. Many of these statements ask for transformative changes. This includes the call from many of the leading environmental organisations on Medium.com under the heading "And/also', not 'Either/or' - The need to restore nature AND cut emissions"80 and the IPBES Guest Article "COVID-19 Stimulus Measures Must Save Lives, Protect Livelihoods, and Safeguard Nature to Reduce the Risk of Future Pandemics"81 as well as many other experts.82



## Examples of Tracking of International Responses to COVID-19

IMF Policy Tracker	COVID-19 Finance Sector Related Policy Responses	Yale Program on Financial Stability: COVID-19 Financial Response Tracker
Tracks key economic responses governments are taking to limit the human and economic impact of the COVID-19 pandemic. The tracker includes 193 economies.	Tracks policy measures taken by country and type of measure in support of the financial sector amid the COVID-19 pandemic.	Tracks economic policy responses aimed at combating the negative effects of the coronavirus outbreak, from official government websites around the world.
https://www.imf.org/en/Topics/imf-and-covid19/ Policy-Responses-to-COVID-19	https://datacatalog.worldbank.org/dataset/covid-19- finance-sector-related-policy-responses	https://som.yale.edu/faculty-research-centers/ centers-initiatives/program-on-financial-stability/ covid-19-tracker
•••••••	••••••••••	•••••••••••••••••
Oxford COVID-19 Government Response Tracker (OxCGRT)	Institute of International Finance (IIF): Prudential Regulatory Measures in Response to COVID-19	Privacy International: Global Privacy Responses to COVID-19
Tracks publicly available information on 11 indicators of government response, such as school closings, travel bans, fiscal and monetary measures, and emergency investment in healthcare.	Tracks prudential measures including capital and liquidity requirements, default and NPL- related measures in response to COVID-19.	Tracks restrictions on people's freedoms, including to their privacy and other human rights. Unprecedented levels of surveillance, data exploitation, and misinformation are being tested across the world.
https://www.bsg.ox.ac.uk/research/research- projects/coronavirus-government-response-tracker	https://www.iif.com/COVID-19	https://privacyinternational.org/examples/tracking- global-response-covid-19
•••••	•••••	••••••
AFI COVID-19 Policy Response	Mobility Restrictions COVID-19	COVID-19 Global Labor & Employment Tracker
Tracks interventions by AFI member institutions that include central banks, fiscal authorities, and organizations aimed at restoring financial stability.	Tracks how COVID-19 affects global mobility.	Track what responsibilities you have as an employer in relation to COVID-19, across multiple countries.
https://www.afi-global.org/afi-covid-19-policy- response	https://migration.iom.int/	https://www.covid19globalemployer.com/
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"If there is a silver lining to the COVID-19 pandemic, it is that it has injected a sense of togetherness into polarised societies. [...] Radical reforms - reversing the prevailing policy direction of the last four decades - will need to be put on the table. Governments will have to accept a more active role in the economy. They must see public services as investments rather than liabilities, and look for ways to make labour markets less insecure. Redistribution will again be on the agenda; the privileges of the elderly and wealthy in question. Policies until recently considered eccentric, such as basic income and wealth taxes, will have to be in the mix."

FINANCIAL TIMES, 3 APRIL 2020

inance Sector Related onses	Yale Program on Financial Stability: COVID-19 Financial Response Tracker
measures taken by country and ire in support of the financial ne COVID-19 pandemic.	Tracks economic policy responses aimed at combating the negative effects of the coronavirus outbreak, from official government websites around the world.
og.worldbank.org/dataset/covid-19- elated-policy-responses	https://som.yale.edu/faculty-research-centers/ centers-initiatives/program-on-financial-stability/ covid-19-tracker
• • • • • • • • • • • • • • • • • • • •	•••••••••••••
International Finance (IIF): Regulatory Measures in COVID-19	Privacy International: Global Privacy Responses to COVID-19
itial measures including capital equirements, default and NPL- ires in response to COVID-19.	Tracks restrictions on people's freedoms, including to their privacy and other human rights. Unprecedented levels of surveillance, data exploitation, and misinformation are being tested across the world.
om/COVID-19	https://privacyinternational.org/examples/tracking- global-response-covid-19
•••••	•••••
strictions COVID-19	COVID-19 Global Labor & Employment Tracker
OVID-19 affects y.	Track what responsibilities you have as an employer in relation to COVID-19, across multiple countries.
n.iom.int/	https://www.covid19globalemployer.com/



## Changes in perspectives: Value shifts and new priorities

In addition to new habits and structural changes the COVID-19 responses have also resulted in deeper changes in perspectives and priorities. Ideas seen as unthinkable just a few weeks ago are now discussed, and assumptions viewed as axiomatic for decades are now questioned by leading policy makers and intellectuals.

The changes that are taking place are examples of a transformative shift of what is called the Overton Window, the range of policies politically acceptable to the mainstream population at a given time.

Society's priorities – e.g., who we should trust, what goods and services we should prioritise, how we should acknowledge professions for their contributions, what services we should consider acceptable to pay for – will fundamentally influence the future.





As priorities change, the tools available and acceptable in society will also change:

- What low-probability high-impact scenar are included in different strategies and reporting, such as is the probability of >8 °C warming included due to high clima sensitivity and tipping points, and what are the breakthrough innovations that fundamentally could change lifestyles to lower excessive consumption?<sup>83</sup>
- How are assessments of impacts on future generations conducted – e.g., how are irreversible changes included and what models are used to measure impacts on people 100 years from now?
- How is nature valued e.g., through intrinvalues, through its economic value as ecosystem services, or not at all?

In addition, underlying trends in society will also be important, such as what power and influence are taken for granted and what are seen as unacceptable and immoral actions that will have a profound effect on how society evolves.<sup>84</sup>

rios te	During the current COVID-19 crisis, society should recall the lessons learned, or not learned, from historic events, including the great depression, World War II, the 1973 oil crisis, the terrorist attacks in 2001 (9/11), the anthrax attacks in the US in 2001 (Amerithrax), the financial crisis of 2007–08, and the 2010 volcano eruption in Eyjafjallajökulland.
e	Each of these historic references highlights specific parallels that differ based on ideological bias and interest. Although history can provide examples that can be used as references, the defining factor of a transformative event is that it is unique. Established stakeholders tend to act as if they are follower of the famous maxim
nsic	"generals always fight the last war" (i.e., generals fight the previous war rather than the war they are presently fighting): the result is that much of the public discussion tends to focus on the issues that were important during the last crisis rather than the present crisis. <sup>85</sup>
lso	
ice	

During the COVID-19 crisis, traditional media outlets have published articles asking profound ethical questions about our society and the world we want to live in, such as the editorial "Virus lays bare the frailty of the social contract?" in the Financial Times<sup>86</sup> and the article by Mark Carney "On how the economy must yield to human value" in the Economist.87

Value will change in the post-covid world. On one level, that's obvious: valuations in global financial markets have imploded, with many suffering their sharpest declines in decades. More fundamentally, the traditional drivers of value have been shaken, new ones will gain prominence, and there's a possibility that the gulf between what markets value and what people value will close.

THE ECONOMIST, 16 APRIL 2020

Three changes in values and priorities are of particular interest with regards to tipping points. These changes are the foundation for many of the tools and theories that guide the underlying ideologies for decision making in politics and business; as well as ethical frameworks for individuals. It is to be determined whether these changes will be integrated into the COVID-19 responses and strategies and support fundamentally different futures:

- 1. Temporal and scope changes of the ethical sphere: empathy and long-termism;
- 2. Justice and fairness: how we live together; and
- 3. Low-probability high-impact events: the long tail.

## 1. Temporal and scope changes of the ethica sphere: Empathy and long-termism

The need to expand our ethical sphere has been illustrated by many reports, including one by the World Bank from 2019 about pandemics: "Evidence suggests that the likelihood of pandemics has increased over the past century because of increased global trave and integration, urbanization, changes in land use, and greater exploitation of the natural environment".88 Each of these five trends have been accelerated by groups with a short-time perspective who care primarily about those cl to them in income, culture, time, and space.

With regards to temporal changes, the COVID crisis has highlighted the problem with shorttermism. For decades, consultants and policy makers have ignored long-term implications of decisions in ways that make society more likely to generate pandemics through the loss of biodiversity, human infiltration into pristine ecosystems, and rapid movement of goods and people without appropriate monitoring and precaution.



al .	The current economic system does not assess, or at least discounts, long-term consequences that make us more vulnerable to global threats and in particular global existential threats. Moreover, a long-term perspective, once measured in centuries and then decades, is now measured in years.
е	
el	Some have described the COVID-19 as a black swan, a metaphor that describes an event that
	comes as a surprise. This is totally wrong and a
	way for those who have ignored low-probability
	nigh-impact events and the warnings from
ose	for a constant situation. Even Nicholas
	To be who nonularized the term has called
<b>`</b>	COVID 10 "wheth up and interface and a state of the second state o
J	COVID-19 wholly predictable." Experts
	nave been loud and clear about the dangers
	with a dangerous pandemic for decades and
	In September 2019 the Global Preparedness
	Monitoring Board issued its annual report on
	global preparedness for health emergencies.
5	

"While disease has always been part of the human experience, a combination of global trends, including insecurity and extreme weather, has heightened the risk. Disease thrives in disorder and has taken advantageoutbreaks have been on the rise for the past several decades and the spectre of a global health emergency looms large. If it is true to say "what's past is prologue", then there is a very real threat of a rapidly moving, highly lethal pandemic of a respiratory pathogen killing 50 to 80 million people and wiping out nearly 5% of the world's economy. A global pandemic on that scale would be catastrophic, creating widespread havoc, instability and insecurity. The world is not prepared."90

Few current responses to COVID-19 include long-term assessments or strategies as these responses have relied on traditional shortterm theories and strategies to create jobs and encourage consumption in general.<sup>91</sup> Increasingly, stakeholders are asking for the use of long-term strategies, but most of these strategies are still traditional as they prioritise labour-intensive job creation in support of climate relevant actions rather than a long-term sustainability agenda that addresses inequity, rapidly evolving technologies, and the need to ensure a flourishing future for all life, human and non-human, on the planet.<sup>92</sup>



Short-termism's failure to adequately address Beside pandemic experts a few organisations societal needs includes its focus on creating have responded to the short-termism in society. jobs in existing structures, an approach that including the Long-Now Foundation, which ignores the systemic changes needed. For was created to 'foster long-term thinking and renewables and energy efficiency in particular, responsibility in the framework of the next 10,000 years'.93 Similarly, EIT Climate KIC has this approach is a significant problem for longterm sustainability. The short-term focus on projects with a focus on long-termism.<sup>94</sup> Most existing sectors results in jobs created by making groups, however, have adopted tools that make unsustainable companies and infrastructure future impacts less relevant or even irrelevant. slightly more energy efficient at the expense of Tools such as discounting<sup>95</sup> and scenario planning new smart digital and lifestyle solutions, that are with limited time horizons and off-setting fossil magnitudes more resource efficient and globally fuel emissions with forests<sup>96</sup> are widespread sustainable. These new smart solutions do not measures that tend to ignore long-term impacts. create many new jobs directly, but they free up significant resources for art, science, education, healthcare, and other parts of society where humans cannot be replaced by robots and AI.

## Job creation in the 20th Century

If short-term job creation in existing sectors would have been the priority during the 20th century, the women doing the washing by hand would have been given more efficient washing bats, instead of investments in high-tech washing machines that resulted in "unemployment", but in a way that allowed for more equitable society. Technologies like the washing machine resulted in a situation where people, especially women, could provide much more valuable contributions. In order to encourage long-term positive outcomes job creating strategies should conduct a "washing bat/washing machine-assessment". Such assessments would encourage resource efficiency and strategic innovations rather than short-term support to existing stakeholders in order for them to keep jobs.

FOR MORE INFORMATION: FRIDGES AND WASHING MACHINES LIBERATED WOMEN HTTPS://WWW.SCIENCEDAILY.COM/RELEASES/2009/03/090312150735.HTM



Although experts have warned of a pandemic for years, policy makers and consultants have ignored these warnings in an effort to increase profits and short-term cost savings.<sup>97</sup> This short-termism, which has now resulted in unprecedented physical suffering and economic losses, is likely to result in the re-evaluation of short-term measures at the expense of long-term catastrophic impacts.

Intragenerational equity is another of the temporal ethical questions that have been highlighted by COVID-19. The capacity to act when current elites are affected by COVID-19 has been contrasted with the lack of capacity to act when future generations are at risk due to dangerous climate change.<sup>98</sup> Who from the affluent older generation will act differently with regards to climate action after they have seen that the younger generations have acted in solidarity with them during the COVID-19 crisis? That is, if the older generations can see that the COVID-19 crisis foreshadows the climate change crisis that will affect the younger generations, they might be more willing to support long-term solutions that will circumvent the worse of climate change's effects.

With regards to the scope of the ethical sphere, so far the COVID-19 responses have focused on human well-being and have ignored the rest of nature. Over time, it appears that societies have expanded their ethical sphere to include people outside their immediate cultural, racial, and

ethnic circle, a view expressed in Steven Pinker's The Better Angels of Our Nature: Why Violence Has Declined and Peter Singer's The Expanding Circle: Ethics, Evolution, and Moral Progress.<sup>99</sup> The next step in this evolution of ethics will be to include non-humans and ecosystems in the ethical sphere.

However, the current economic system treats nature as a commodity - i.e., a resource that only has economic value. Many environmental groups have adopted such a perspective and employed neoclassical economists to argue for ecosystem protection based on nature's capacity to deliver 'ecological services',<sup>100</sup> a view that depends on price and ownership as the solution to threats against nature.<sup>101</sup> While such an approach can improve existing unsustainable systems, it also strengthens stakeholder tendency to view nature only as a commodity.

A growing momentum has pushed for an expansion of the ethical sphere, i.e. an approach where nature has intrinsic value.<sup>102</sup> E.O. Wilson, for example, introduced the biophilia hypothesis<sup>103</sup> as a way to account for people's innate tendency to seek connections with nature and other forms of life. In China, Pan Jiahua has explored the idea of Ecological Civilization as a way to account for nature's intrinsic value.<sup>104</sup> In addition, many groups in the west have highlighted the negative consequences of approaching nature from a narrow economic perspective.<sup>105</sup>

What kind of a species are we that we treat the rest of life so cheaply? There are those who think that's the destiny of Earth: we arrived, we're humanizing the Earth, and it will be the destiny of Earth for us to wipe humans out and most of the rest of biodiversity. But I think the great majority of thoughtful people consider that a morally wrong position to take, and a very dangerous one.

E.O WILSON, NATIONAL GEOGRAPHIC, 2014



This expansion of the ethical sphere to include nature has, so far, been resisted by nationalistic and anthropocentric agendas that instead want to shrink the ethical sphere and promote the idea that people of other cultures or countries have less value.<sup>106</sup> Two trends that support this narrow view of the ethical sphere are reduced international cooperation and international solidarity through the reduction of international aid.107

How threats, from zoonosis to overconsumption, will be addressed in the future depends on how market context.<sup>109</sup> we define the ethical sphere. We can either grow the ethical sphere or shrink the ethical sphere. In a 2012 article in The Atlantic, Michael Sandel For example, the ethical sphere could grow to examines how the market society works using cases to provoke as well as highlight questions include future generations and nature in ways that drive innovation and changes in institutional about justice and fairness, including the 'free structures or the ethical sphere could shrink to movement of goods, service, people and a point that it focuses on current generations capital'.<sup>110</sup> When discussing this 'free movement', the COVID-19 crisis has made it clear that we where each country acts to maximise resources need to ask who receives the benefits of this 'free and nature's only value is related to its economic value. The first scenario would support a resource movement' and what are the implications of this efficient innovation agenda where globally 'free movement'. For Sandel, a market society is sustainable lifestyles can exist. The second designed to reflect society's overarching value scenario would focus on short-term job creation system, which not only informs a country's and accelerate consumption using strategies such economic functions but also the relations among as labour-intensive bioenergy based on national a country's citizenship. availability to biomass and support for existing companies with unsustainable business models. Clearly, the expansion of the ethical sphere to include future generations and nature is an ethical imperative.

## 2. Justice and fairness: How we live together

The pandemic has made it clear that a society is no stronger than its weakest members.<sup>108</sup> Many have welcomed the focus on society's needs rather than the focus on efficient economic tools. Until recently, the development of efficient economic tools as an answer to society's problems has been the focus. Moreover, a shift from a market economy to a market society has placed many areas, including natural resources, pollution, healthcare, and education, in a pure



## What you can pay for

- Access to the carpool lane while driving solo: \$8. Minneapolis, San Diego, Houston, Seattle, and other cities have sought to ease traffic congestion by letting solo drivers pay to drive in carpool lanes, at rates that vary according to traffic.
- The right to shoot an endangered black rhino: \$250,000. South Africa has begun letting some ranchers sell hunters the right to kill a limited number of rhinos, to give the ranchers an incentive to raise and protect the endangered species.
- The right to emit a metric ton of carbon dioxide into the atmosphere: \$10.50. The European Union runs a carbon-dioxideemissions market that enables companies to buy and sell the right to pollute.
- Your doctor's cellphone number: \$1,500 and up per year. A growing number of "concierge" doctors offer cellphone access and same-day appointments for patients willing to pay annual fees ranging from \$1,500 to \$25,000.

## New ways to make money

- Sell space on your forehead to display commercial advertising: \$10,000. A single mother in Utah who needed money for her son's education was paid \$10,000 by an online casino to install a permanent tattoo of the casino's Web address on her forehead. Temporary tattoo ads earn less.
- Serve as a human guinea pig in a drug-safety trial for a pharmaceutical company: \$7,500. The pay can be higher or lower, depending on the invasiveness of the procedure used to test the drug's effect and the discomfort involved.
- Fight in Somalia or Afghanistan for a private military contractor: up to \$1,000 a day. The pay varies according to qualifications, experience, and nationality.

MICHAEL SANDEL, WHAT ISN'T FOR SALE?, THE ATLANTIC, APRIL 2012

Similar arguments, albeit more sophisticated, were also put forward in an April 2020 article in *Foreign Affairs* by Paul Romer, a former Vice President of the World Bank and Nobel Laure Romer's article, subtitled "Do Economists Haw Too Much Power?", problematizes the role of economists:

Asking economists to set a value for human li obscured the fundamental distinction betwee the two questions that feed into every policy decision. One is empirical: What will happen the government adopts this policy? The other is normative: Should the government adopt it? Economists can use evidence and logic to answer the first question. But there is no factual or logical argument that can answer t second one.<sup>111</sup>

## The COVID-19 crisis has also highlighted

more structural challenges for justice such as tax evasion and if these actions are seen as acceptable. When poor countries obviously ne resources to protect the lives and livelihoods of already vulnerable people, rich people and companies who avoid paying taxes, whether through legal or illegal means, challenge notion of justice and fairness, a condition that policy makers and mainstream media seem to ignore

Even more fundamental questions about the r of companies have been called into question.



	Should companies care primarily about society
	and employees or should the business of
	business be business? <sup>112</sup> The rationale to protect
ate.	employment rather than shareholder profits and
/e	executive bonus payments is based on the fact
	that taxes should benefit workers rather than
	companies, especially during times of a crisis
	such as COVID-19. Even mainstream media
ife	have questioned why money specified for the
en	COVID-19 response went to companies rather
,	than individuals, a situation also evident during
if	the most recent financial crisis. <sup>113</sup> Nonetheless,
r	companies in most countries exist based on
	the rules and regulations already in place, so in
	a market society the way companies conduct
	their business should benefit society as a whole,
he	including during crises such as COVID-19. <sup>114</sup>
	The discussion about justice in society and how
	governments should support a sustainable
	outcome comes at a time when more and more
	companies realize that they need to report and
eed	clarify how they contribute to society – i.e., how
	they make the world a better place. <sup>113</sup> Post-
	COVID-19, we could see a new standard where
	companies must move beyond snowing that their
115	operations do not negatively affect society (ESG
	reporting of Busiliess sustainability 1.0-2.0) to
	supports a just and sustainable future (Pusiness
olo	supports a just and sustainable ruture (DUSINESS sustainability $3 \text{ O}$ ) <sup>116</sup>
UIE	sustainability 3.0/.

## 3. Low-probability/high-impact: The long tail<sup>117</sup>

COVID-19 has many negative consequences, although the situation is still relatively benign as a longer incubation combined with higher mortality could have resulted in a pandemic with order of magnitudes higher suffering and death. Growing antibiotic resistance is also making society more vulnerable to superbugs - i.e., bacteria, viruses, parasites, and fungi that are resistant to most antibiotics and other medications commonly used to treat infections.<sup>118</sup> Expert organisations working on antibiotic resistance, such as ReAct, have highlighted that one of the consequences of the COVID-19 pandemic is that vaccination efforts that help control other diseases may be put on hold. This delay may lead to increased strain on health systems, further increasing morbidities and mortality.<sup>119</sup>

Looking forward, a catastrophic pandemic is still just one of a small group of existential threats to humanity and more resources are needed to reduce the probability of such threats.

Using all relevant risk metrics, we can see climate change is a threat magnitudes more serious than COVID-19.<sup>120</sup> Yet, many stakeholders equate the climate threat with COVID-19 as they want

to use the political willingness to act in the face of a relatively small threat such as COVID-19 to encourage action to mitigate a more substantial threat, climate change. However, the comparison is misleading and potentially dangerous if people come to believe that climate change is similar to or only about COVID-19.121 Nonetheless, the focus on COVID-19 could promote a mainstream conversation that helps frame the need for climate action and a sustainable future. This conversation could address the following questions:

- a. How should the world collaborate to address global existential threats?
- **b.** What is currently included and excluded in policy decisions as well as in business decisions that affect low-probability highimpact events?
- c. What time horizon should be used in different processes and how should we value future generations, which are currently ignored or discounted?
- d. How can global catastrophic risks drive innovation?122



# becoming the value of everything. [...]

After the COVID crisis, it's reasonable to expect people to demand improvements in the quality and coverage of social support and medical care, greater attention to be paid to managing tail risks, and more heed to be given to the advice of scientific experts.

The great test of whether this new hierarchy of values will prevail is climate change. After all, climate change is an issue that (i) involves the entire world, from which no one will be able to self-isolate; (ii) is predicted by science to be the central risk tomorrow; and (iii) we can only address if we act in advance and in solidarity."

MARK CARNEY, FORMER GOVERNOR OF THE BANK OF ENGLAND, THE ECONOMIST, APRIL 16 2020



## COVID-19 responses: Three categories of tipping points

"in recent decades, subtly but relentlessly, we have been moving from a market economy to a market society. Increasingly, to be valued, an asset or activity has to be in a market. For example, Amazon is one of the world's most valuable companies, yet the Amazon region appears on no ledger until it is stripped of its foliage, and converted to farmland. The price of everything is

# **TIPPING POINTS** with potentially radically different outcomes

Based on the cases www.covid-19-responses-climate.solutions, several potential tipping points have been identified. These are areas where multiple trends converge to create new tensions. Many tipping points also have the potential to create aggregated tipping points.



Tipping **Could undermine a** points 1.5 °C LED agenda New ways of delivering on needs ..... Lifestyles More fear-driven high-material consumption lifestyles driven by by traditional companies to acce their unsustainable business mo areas from airlines to fast fashio ..... **Digital solutions** Increased cyber balkanization, d among citizens, increased surve decreased freedom of expression surveillance and censorship. Con that view citizens as products to the highest bidder lead the devel of digital tools. \_\_\_\_ Corporate No lessons from the new ways of transformation what is needed. Transformation smaller start-ups. •••••••••••••••• Experiences of Bad experiences with resource e smart solutions solutions such as teleworking ar meetings, resulting in accelerate of unsustainable solutions, from car ownership and private jet use less sharing and circular consum Sensational media and companie solutions are likely to push this a ..... Frustration over the limits of cor Consumption/ Preference shifts results in accelerated overconsu and demand for even faster deliv goods with the result of an even resource intensive and inefficien .....

## Could support a 1.5 °C LED agenda



/ an urge elerate dels in n.	New smarter and less resource intensive lifestyles established as the norm for the future and driven by an urge to move beyond a focus on material consumption among the rich and a focus on innovations that benefit the less affluent on the planet.
listrust illance and n through npanies be sold to lopment	Smart resource efficient solutions supporting new business models and global collaboration. For profit and not-for-profit organisations collaborate to deliver solutions for the greatest challenges of our time.
f providing limited to	Accelerating shifts with purpose driven companies that review their business models based on needs in society and lead the discussion about what is needed. New business models and digitalisation for a better world is at the core.
efficient nd virtual ed use private e to option. es with old agenda.	Low-impact regenerative lifestyles become the new norm with a shift from physical ways of delivering a service to digital ways, and an overall shift to a lifestyle based on experience rather than material consumption.
nsumption Imption very of more nt society.	The experience of less consumption results in a situation where many people realise they can get by with fewer material goods and develop a focus on the most essential elements of their lives as well as a new drive to save financial resources for future crises.

Could undermine	а
1.5 °C LED agenda	a

Tipping

points

## Could support a 1.5 ℃ LED agenda



Structural/Macro- economic changes		
Global risks	Less focus on global sustainability/climate change and more on returning to the old unsustainable trajectory.	More focus on global sustainability and other major threats to humanity as well as global equity and a flourishing society.
Data	Increased surveillance and privatised data driven by governments wanting to control their population and companies viewing citizens as products.	Open and free data that is owned by citizens, with empowerment of citizens and advancements in science.
Economic priorities (stimulus)	Based on old economic models and ideas, stimulus initiatives focus on existing large companies with unsustainable business models resulting in increased emissions, ecological destruction, increased inequality, and disempowered citizens.	Focus on improved welfare in harmony with nature resulting in support for companies with sustainable solutions for tomorrow operating in a responsible manner. Particular focus on a new generation of SMEs with new innovative and smart solutions.
Necessity	Back to focus on creating needs for more of everything, with sectors such as fast fashion, fast food, building, and private car ownership continuing to grow.	Ensuring that basic needs and essential goods are provided and that empowered people can find areas where they want to flourish in collaboration with others. Something that might be possible to deliver with much less resources than currently is assumed. <sup>123</sup>
Spatial focus	Focus on local/national in opposition to the international/global.	Focus on the global with inclusion of the local and national.
Temporal focus	Discounting and disregard for future generations.	Intergenerational equity.
Resilience	Increased isolationism, increased protectionism, and reduced international collaboration with focus on nationalism.	Decentralised solutions and a society in balance with nature.
Leader ideas	Strong leaders with disregard for an open and transparent society.	A fair and ecologically sustainable society with support for an open and transparent society.
Advising companies and governments	Same consultants and experts with a neoclassic economic outlook that focuses on short-term economic gains and ignores long-tail low probability high impact outcomes and disregards global sustainability.	A focus on what companies and governments provide to society where long-tail low probability high impact outcomes and global sustainability are accounted for.

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Tipping points

## Could undermine a 1.5 °C LED agenda





Value shifts and new perspectives	
Temporal focus	Focus on getting back to how thing to be and on current generations.
Relation to risk	Focus on direct simple economic r affect large companies in the shor
Ethical values	More hierarchy, simplicity, and traditional values.
Sacrifice	Traditional sacrifice for dominance focus on the nation, or smaller gro conflict with the rest of the world.
Economic priority	Improve efficiency in existing syste with more redundancy and more r based structures.
Baseline	Continued use of business as usua "normal" and "baseline".

## Could support a 1.5 °C LED agenda



new perspectives		
Temporal focus	Focus on getting back to how things used to be and on current generations.	Focus on a sustainable future and future generations.
Relation to risk	Focus on direct simple economic risks that affect large companies in the short-term.	Focus on low-probability risks for human welfare and use of these risks to drive innovation.
Ethical values	More hierarchy, simplicity, and traditional values.	More inclusiveness and equity as well as new areas such as the right to own your own data and genetic information.
Sacrifice	Traditional sacrifice for dominance with focus on the nation, or smaller groups, in conflict with the rest of the world.	A view on sacrifice where future generations and nature are seen as ethically obvious and welcomed acceptable constraints on action.
Economic priority	Improve efficiency in existing systems with more redundancy and more nation- based structures.	Prioritisation of teachers, healthcare workers, future generations, and nature.
Baseline	Continued use of business as usual as "normal" and "baseline".	Shift so that a sustainable path is called the baseline, and current business as usual is referred to as "dangerous climate climate scenarios".



Most groups in government or in business focus on improving the existing systems, often on the margins. This focus dominates the theories we have, the tools we use, and the leaders we celebrate. The transparency we ask for tends to get cloudy when the needs move beyond management and improvement of existing systems.

Collaboration is needed when no specific parts of government or the corporate sector are capable of guiding us through a transformative system change. Although traditional groups with different focuses and skills are needed, transformative system requires individuals and groups who can take on the roles of catalysts and platforms. Organisations and individuals ready to play a part as catalysts and be part of the platforms needed to create positive change do not wait for a crisis to be over or wait for 'things to get back to normal'. These stakeholders present concrete ideas and actions for how to move towards a sustainable future. On the following pages are five possible ways forward based on the early reactions to COVID-19, as well as reactions to earlier events that have resulted in tipping points.



Possible ways forward

## Establish catalysts and platforms for transformative system change

Currently, most stakeholders work as reactive, marginal, or research agents of change. The reactive stakeholders can be of very different kinds, from investigative reporters to activist groups. These people and groups identify trajectories that need to be stopped. These problems can be anything from a test of a weapon to a tax increase. These groups want to make their voices heard and convince others that something needs to stop. Much of the climate work was born out of groups with this "stop" agenda. The marginal stakeholders are civil servants and most employees in large companies. They work within a system with certain rules and

their job is to improve an existing system. Many of these actors are innovative, but it is innovation within a very narrow set of conditions. Finally, the research stakeholders, often academics and researchers in corporate R&D labs, try to understand the world with most of their effort spent on better understanding existing systems. Together, these three groups form the backbone of an open and dynamic industrial society. Most of the time, innovations target pre-existing technologies or systems, such as cars, buildings, airplanes, and food production, that are improved based on well-established values codified in laws, tools, and habits.

During a crisis and when multiple trends converge, the process and logic of improvement of existing systems collapses. Instead of incremental improvements of existing systems, new systems emerge that provide new solutions and result in new challenges. These new solutions are more than substitutions of one technology for another; they are transformative shifts that result in new ways of providing solutions based on new knowledge, values, regulations, business models, and underlying infrastructures. After the establishment of these new systems, a new circle of incremental improvement in existing systems re-emerges based on new values, principles, and stakeholders. For years, or even decades, the two systems can exist in parallel, but

To support a 1.5 °C compatible paradigm shift, catalysts and platforms for transformative system change need to be supported. For example, it will be important to develop platforms that allow stakeholders from different spheres to come together. Equally important, stakeholders need room to discuss issues without the pressure of economic concerns as many of the most important transformative changes that should be explored might not have obvious revenue streams attached to them. Certain areas might also be better as public goods, provided by



eventually the old system fades away, replaced by a new paradigm. In the transition between paradigms, many previous assumptions are no longer valid, including the tools and models used to perpetuate and rationalise the old paradigm. For example, COVID-19 will probably result in significant changes in values, habits, and macroeconomic structures, but to what degree the COVID-19 experience will be transformative is to be determined.





## Support need-based structures for innovation and solutions

Most of the existing structures in today's society are based on old ways to satisfy needs. To support a new generation of solutions and providers capable of delivering these solutions, a focus on the actual needs in society is needed rather than a focus on current companies and their solutions. For more than 100 years, many institutions have been organised to bring humanity out of poverty, but currently these institutions contribute to the problems we see, from climate change and biodiversity loss to overconsumption and inequity. Since Eisenhower, the world has been aware of the military industrial complex, and now it is time to also acknowledge the growth industrial complex based on 19th century technologies. These industries provide much of what we need and employment for many, but now

we need to explore how to transition to a smarter, more resource efficient, and more equitable society. Addressing this issue requires placing the needs of people first; and creating the structures that can deliver these needs is one of the priority areas for the early 21st century.

## Open data and scientific cooperation.

In response to COVID-19, the international research community has shown the importance of global collaboration.<sup>124</sup> Open data and collaboration over borders are key to addressing global challenges. The ownership and right to data must be better regulated and the focus must be on benefit of citizens rather than the benefit of a few corporations.



## Explore and support ethical shifts for global sustainability

As the result of COVID-19, several significant value changes and shifts in perspectives are emerging that could have profound effects on society. The following areas are of particular interest:

- 1. Value in society What do we want to prioritise in society and how can these priorities be rewarded?
- 2. Long-termism What time horizons are



The next revolution – World War III – will be waged inside your head. It will be, as Marshall McLuhan predicted, a guerrilla information war fought not in the sky or on the streets, not in the forests or around international fishing boundaries on the high seas, but in newspapers and magazines, on the radio, on TV, and in cyberspace.

It will be a dirty, no-holds-barred propaganda war of competing worldviews and alternative visions of the future.



- relevant and what tools can be developed to capture long-term irreversible impacts?
  - 3. Nature How do we need to change our relation to nature to capture its complexity, address extinction, and reconnect with its value beyond the monetary?
  - 4. Existential risks How can the exploration of low-probability high-impact events drive innovation and support global collaboration?



## **Real-time research**

Many of the assumptions for a sustainable energy transition that have been taken for granted are no longer valid, from the kind of solutions possible via carbon market pricing to understanding of low-probability high-impact events. Suddenly, a large part of the world has become a transition lab. Several key areas could benefit from research over the next 12-18 months, including the strategic responses and long-term sustainable developments. These research sprints could also help move R&D spending from a sector perspective to a solution or need perspective.

Below are five areas where global collaborative research sprints could deliver important guidance as outlined in the preliminary results before summer and in the first "Corona Climate Report" ready for COP26 (virtual or physical):

1. What available solutions can reduce the need for mobility – both for people and goods - and how can we embed these in the longer term to reduce energy demand? Are there innovation gaps that need to be filled, particularly digital or new business model innovation gaps?

- 2. How are businesses and people responding to a rapid shock to demand and supply (e.g., car manufacturers and fashion businesses switching production)? What are the impacts on the energy system? How are businesses innovating and how can we apply the lessons learned to the rapid transition to clean energy?
- 3. How might the coronavirus impact clean energy innovation investments and priorities? What kind of stimuli could help support sustainable innovation as well as help kickstart the economy?
- 4. What links exist between different existential threats such as climate change and pandemics and new technologies such as synthetic biology, nanotechnologies, and AI. What synergies exist and what innovation could help deliver on multiple challenges?
- 5. What are the impacts on international cooperation and what tools could strengthen intergovernmental and public-private collaboration with reduced mobility?

The need for recovery and stimuli packages also provides an opportunity for an international research, development, and deployment initiative that accelerates the uptake of smart solutions in three areas that support economic recovery, netzero emissions, and reduced risk of pandemics due to zoonosis:

- 1. Global circular green hydrogen infrastructure. Including resource efficient recycling of relevant materials and renewable energy production based on the most efficient access to energy;
- 2. Digital smart systems with system transformation; and
- 3. Energy storage systems for decentralised systems.

## **Explore future priorities in society**

COVID-19 has placed society in a situation where what is important and what we want in society has been discussed. These concerns are reflected in the following areas:

## 1. What do we need in society?

With the need to prioritise, societies have established lists of "non-essential/essential goods".<sup>125</sup> What is really important has also been discussed in the context of when people change habits and are faced with many new choices. As we move forward, there is an opportunity for society to focus more on what is needed and how to ensure all people have access to these goods.

## 2. Who is providing valuable services in society?

Since COVID-19, society has acknowledged the importance of healthcare workers in unprecedented ways.<sup>126</sup> In addition, teachers and farmers have been praised for their important contributions to society.<sup>127</sup> These groups are fundamental for a working society, yet the resources spent on these groups and how often their voices are heard do not represent their importance. Clearly, these oversights need to change.

At the other end of the spectrum, the central role of influencers has been discussed.<sup>128</sup> Many in these groups drive overconsumption and are marketing tools for companies trying to sell unnecessary products. Fast fashion companies have been celebrated when they shift their production towards something society really needs.<sup>129</sup> However, these companies have also been criticised for using the crisis to accelerate their online sales and keep people focused on unnecessary consumption.130

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# **APPENDIX 1**

An overview of the three traditional stakeholder groups and the transformative/system change platforms needed in times of disruptions.



# **ENDNOTES**

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