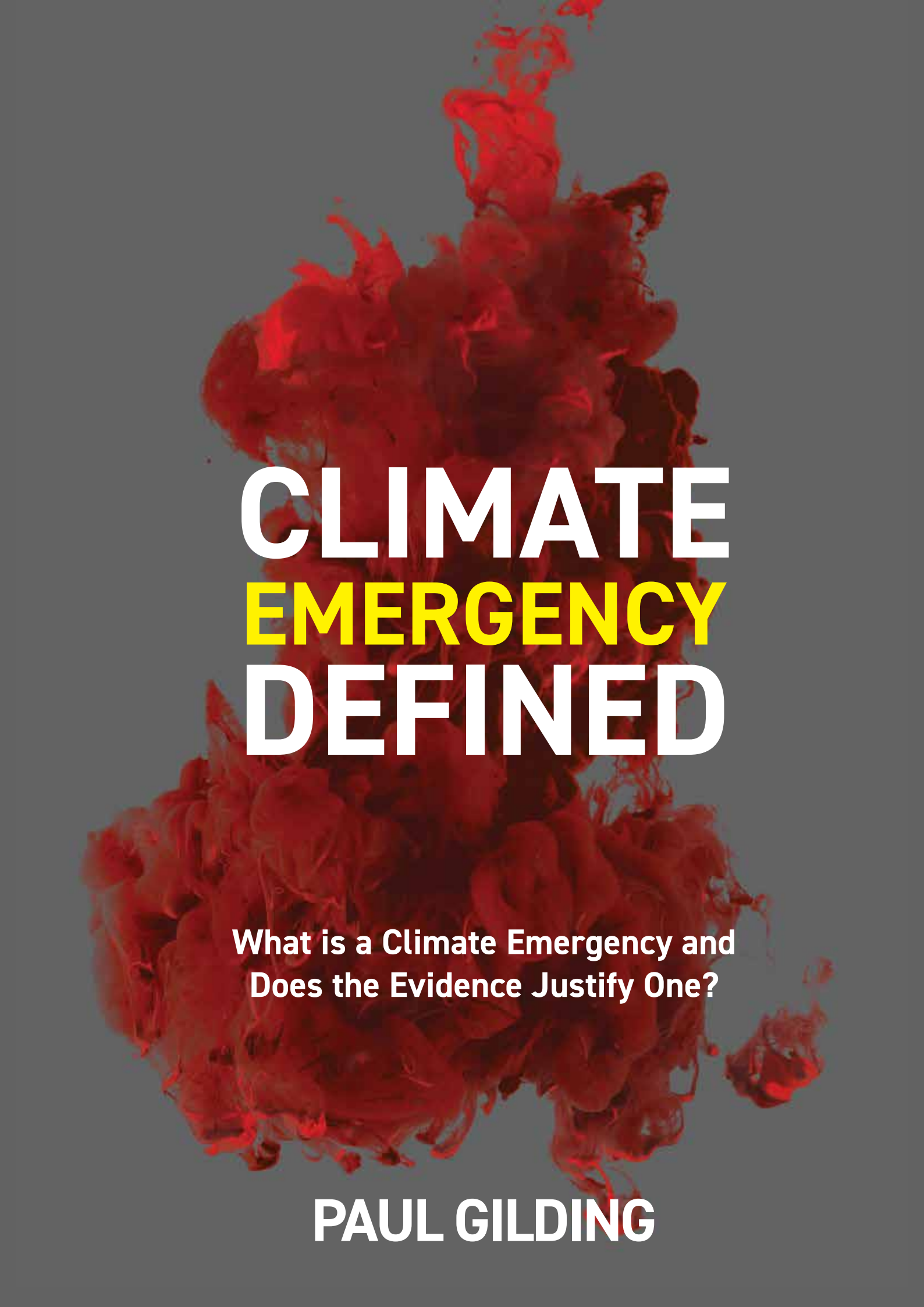


# CLIMATE EMERGENCY DEFINED

What is a Climate Emergency and
Does the Evidence Justify One?

PAUL GILDING

## ABOUT THE AUTHOR

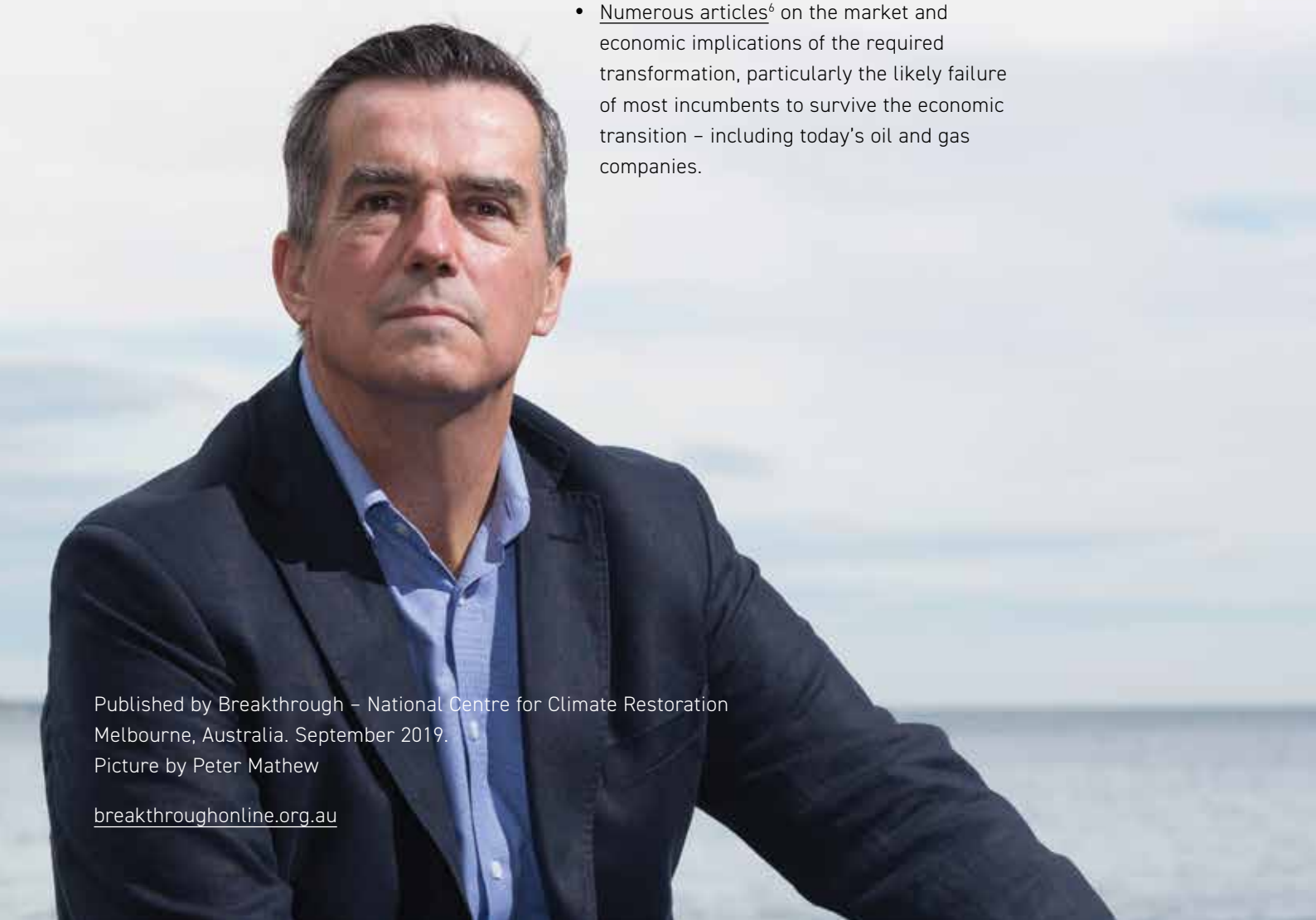
Paul Gilding is a Fellow at the University of Cambridge Institute for Sustainability Leadership. He has 45 years of history in sustainability and thought leadership on market-driven and business-led change, including 30 years on climate change.

He has been focusing on the climate emergency question since 2005 when he wrote a paper 'Scream Crash Boom'[1] arguing that:

- Based on the historical evidence, society would not respond to climate change until it both was — and was seen to be — an emergency; and
- Humanity was quite capable of responding to such an emergency with the extraordinary speed and scale that would then be necessary to address it.

In the 15 years since, he has also published:

- The One Degree War Plan[2] (2009, with Prof Jorgen Randers) which explained what a global emergency response could entail if a 'safe climate', using one degree of warming as a reference point, was to be secured. It suggested a likely start date around 2020;
- The Great Disruption[3] (2011, Bloomsbury) which explored the economic and social context of an emergency response, including the likely process by which society would eventually engage in such an approach;
- The Mother of All Conflicts[4] (2012, Brown Journal of World Affairs) which examined the role of the military and security forces in preparing for the geopolitical implications of climate change;
- War – What is it Good For[5] (2016, Breakthrough) which explored the economic benefits of an emergency mobilisation and why it could be the best way for economic policymakers to address a number of key global challenges; and
- Numerous articles[6] on the market and economic implications of the required transformation, particularly the likely failure of most incumbents to survive the economic transition – including today's oil and gas companies.



Published by Breakthrough – National Centre for Climate Restoration
Melbourne, Australia. September 2019.
Picture by Peter Mathew

breakthroughonline.org.au

# INTRODUCTION

**IN THE CONTEXT OF AN INCREASING NUMBER OF 'CLIMATE EMERGENCY DECLARATIONS', AND THE ACCELERATING ADOPTION OF THE TERM 'CLIMATE EMERGENCY', THIS PAPER EXPLORES THE CONCEPT.**

Firstly, it examines what treating a threat or risk as 'an emergency' means in practical terms, referenced to other examples of emergency responses, ranging from local emergencies like flooding, to major historical events like World War II (WWII).

It then considers the scientific evidence, the risk-assessment basis and other criteria for considering whether climate change actually qualifies as a 'global emergency'.

To do so, it considers two criteria, arguing they must ***both*** be satisfied to justify an emergency response:

## IS THE RISK MATERIAL?

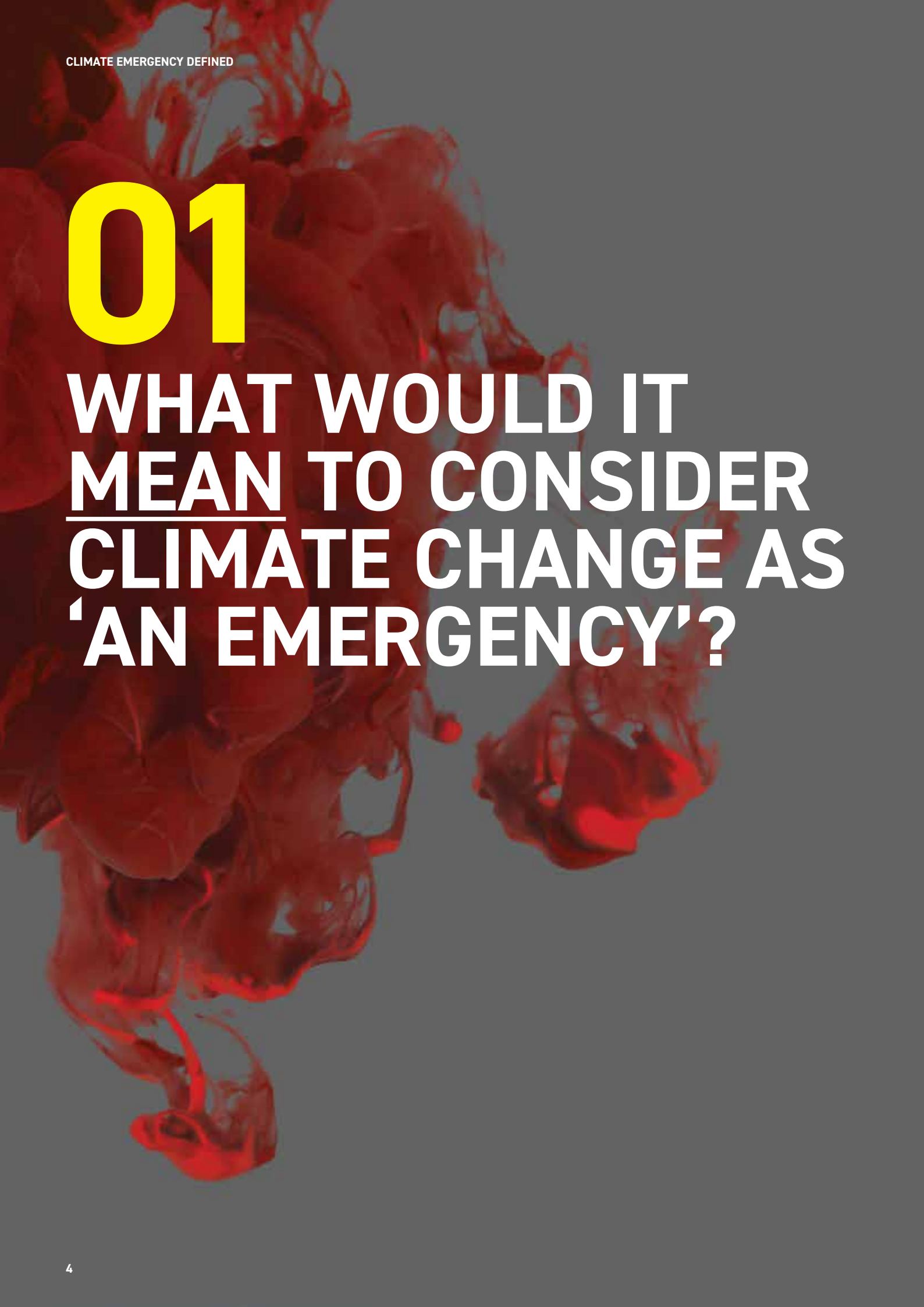
- Is the threat established and well understood?
- Relative to the scale of threat, is the likelihood of it occurring high enough to justify an emergency response?

## IS THE TIMING URGENT?

- Does the response require an emergency mobilisation – that is, an abnormal level of intensity and resources?
- Or, can the risk be dealt with through the normal reform processes of policy and the market?

These questions are then considered in reference to our current economic and political response to climate change, comparing this to what would be required if society shifted to an emergency mode of action.

We need to understand if such a shift is justified by the evidence because, if it is, then it challenges those in authority whose core responsibility is to protect their citizens from threat.



# 01

# WHAT WOULD IT MEAN TO CONSIDER CLIMATE CHANGE AS 'AN EMERGENCY'?

## WE WILL LATER ADDRESS WHETHER CLIMATE CHANGE IS NOW AN EMERGENCY, BUT FIRST, WHAT DOES IT MEAN TO TREAT A THREAT AS 'AN EMERGENCY'?

An emergency is a situation where the normal ways we manage society and the economy cannot adequately deal with the risk we face. It implies, therefore, a change to what we do, commensurate with both the scale and urgency of the risk.

Declaring an emergency should result in the development of a plan, underpinned by strong leadership, that communicates, coordinates and deploys the practical capacity and financing to protect communities from the threat, including the most vulnerable. In most emergencies, only the state has the authority and capacity to act in this way. The community relies on the state to do so.

This is well understood from other emergency responses, where the practical processes of managing an emergency are widely known. In these cases, we have various mechanisms and legal frameworks in place within which to act. Important examples include:

- Localised emergencies, like bushfires, earthquakes, floods and terrorist attacks;
- Regional emergencies, like famine and conflict; and
- Global emergencies like WWII and the 2008 Global Financial Crisis.

From these, we know the basic characteristics of an emergency response. As the Breakthrough Climate Centre[7] describes it: *"In emergency mode we stop 'business-as-usual' because nothing else matters as much as the crisis. We don't rush thoughtlessly in, but focus on a plan of action, which we implement with thought, and all possible care and speed, to protect others and get to safety."*

The Breakthrough Climate Centre continues, using the comparison to WWII: *"A 'whatever it takes' attitude means that government plans and directs the nation's resources and capacity towards building up the war effort. This can be done at amazing speed."*

For example, in WWII, military outlays, as a proportion of the national economy, grew from less than 2% pre-war to around 37% of GDP by 1945 in the USA[8] (the GDP increased itself by 75%[9] in that time, making the observed increase even more dramatic) and from 2.5% to 52% of GDP in the UK.[10] These enormous economic shifts happened in less than a decade.

An emergency response only implements a 'whatever it takes' approach commensurate in scale and resources to the level of threat and urgency. For example, the response to local flooding is naturally of a different scale to that in a war.

This then leads us to compare the level of risk posed by climate change with the current response to that risk, and to ask the question: 'Should climate change now be considered as the climate emergency'?

In doing so, we need to clearly differentiate that question from either the political/rhetorical process of 'declaring' an emergency, or actually having a practical 'emergency response' in place. Both of those are also important, but first we need to consider whether the evidence confirms climate change is 'an emergency'. Does the evidence really support such an approach?

This should be considered as a rational, analytical question, not one of advocacy, belief or ideology. It is a judgement, to be made ultimately by those in authority, on:

- The scale, timing and magnitude of the threat or risk; and
- The speed of response required to address it effectively.

Both of these criteria need to be considered, because an emergency response can, by definition and indeed by intent, be very disruptive to the status quo. So, even if the risk is very high, an emergency response would not be justified if there were time to address that risk through the normal reform processes of policy and markets. Likewise, if the risks are manageable and can be adapted to effectively, then the disruption of an emergency response may again not be justified.

This means an emergency approach is justified ***only*** if:

- The risk is high; ***and***
- The consequences of failure are unmanageable or unacceptable; ***and***
- There is a time constraint governing whether a response will be effective.

In the context of knowing how disruptive treating something as an emergency can be, we can now ask the questions outlined above, in respect to climate change.

Is the threat large enough ***and*** the required response urgent enough, to justify a genuine emergency response?

Hurricane Katrina
New Orleans Floods, 2005

# 02

# THE SCALE, TIMING AND LEVEL OF THE THREAT

## HOW DO WE MAKE DECISIONS ON RISK, AND HOW DOES THIS RELATE TO OUR CURRENT CONTEXT?

First, we should consider how society normally manages risks and threats.

To make a decision on a risk, and what the response should be, is always a judgement. It is usually a decision made by those in authority based on the evidence of experts.

In the climate debate, we are often distracted, generally by those resisting action, by arguments over the level of certainty. The argument is: "We can't be sure – so we should not act, or at least we should act cautiously, because action is expensive and disruptive".

History tells us, however, that leaders almost never make decisions based on certainty, even if it appears so in hindsight.

For example, there was enormous controversy in the United Kingdom before WWII about how serious the threat was, and what the response should be. Many people, including highly informed experts and leaders, argued about:

- The level of threat – was it really that significant?
- The cost and consequences of acting on the risk – can we afford the required response? and
- The possibility of adapting to the impacts – instead of confronting the cause.

We see much the same debates today on climate.

This is normal human behaviour. As it was before WWII, there is natural resistance to facing an unpleasant reality. War is not something to enter lightly. However, nobody argued in hindsight that the response to the threat was overblown.

So we need to acknowledge the natural tendency to understate the risk, especially when addressing it is going to be disruptive to the status quo or the advocates' self-interest.

This means that, in making a decision on the risk of climate change, we should carefully and impartially examine the evidence, while remaining cognisant of the natural human resistance to unpleasant reality.

## WHAT DOES THE SCIENCE TELL US ABOUT THE LEVEL OF THREAT?

Firstly, it should be noted that it is not the purpose of this paper to present the science in comprehensive detail, as this has been done elsewhere. It will be summarised here with extensive references for those who wish to examine it further.

In considering the level of risk, we can draw from an enormous body of strong, peer-reviewed science, and the analysis of its conclusions by countless, credible global bodies and experts in science, economics and politics.[11]

In summary, this large body of work shows that the world's most qualified people on the topic conclude that:

- The threat is here now — climate change is already dangerous today;
- The threat is rapidly accelerating — and ahead of earlier predictions; and
- The system on which our economy and population relies is at risk of major global instability.

In terms of outcomes and likelihood, they conclude that we face:

- Widespread negative and potentially catastrophic economic, social and environmental impacts that could last for hundreds of years, affecting all countries and many billions of people. This is close to certain.
- A further level of existential risk of global economic and social collapse and the descent into chaos and conflict, lasting for centuries. This could result in the collapse of organised global society.

The question on the latter, and more serious risk, is not whether this outcome is ***certain*** on our current path. It is not. The question is whether there is a reasonable likelihood[a] of such an outcome, which there is.

a For example, a massive meteor strike is an existential risk to civilisation, but it is very unlikely in the next few thousand years.

## WHAT DOES THE SCIENCE TELL US ABOUT THE PATH WE ARE ON TODAY?

It is difficult to comprehend a threat at the scale of the climate crisis, let alone a civilisation-wide collapse. And it is very hard to model the consequences or accurately predict the likelihood. But those who have tried to do so provide a credible and useful reference point for the type and scale of risks involved on the path we are currently on. This work is directionally very important to judging how large the risk is, and how much disruptive action we are prepared to take to reduce the risk.

For context, today, carbon dioxide ($CO_2$)[12] and methane[13] levels have reached historic highs for the human era. This represents our current state of response to the risk. There has been no reduction in the total emissions, which are creating the risk, some 30 years after it was known that climate change was a threat, despite widespread global acceptance of the urgency. We should not confuse high awareness, global treaties and debate with any effective action to alleviate the threat.

Scientists warn that even if all of the Paris emissions commitments were met, temperatures would surpass 1.5°C warming (the target agreed to in Paris[b]), and then increase by 3 to 5°C by 2100 — with additional warming beyond[14, 15].

The last time the world was that hot (4°C warmer[16]) was 15 million years ago in the Miocene. At this temperature, all of nature will be affected — all coral reefs would have disappeared decades earlier, and MIT's Lorenz Centre predicts that 2100 will "herald the beginning of the Earth's sixth mass extinction event".

Seas could rise by more than 2 metres[17] this century (and greater beyond 2100). Between two-thirds and ***all*** of the glaciers that feed Asia and South America's most important rivers will likely disappear.[18] A combination of high temperature and humidity levels along the equatorial belt could see tropical regions in Asia, Africa, Australia and the Americas become "largely uninhabitable for much of the year". A large proportion of humanity, including an estimated 2 billion refugees[19], would need to relocate — many to areas of higher latitude or the lower southern hemisphere, where agriculture will still be possible and temperatures tolerable. The global population is over seven billion today and, by 2100, it is likely to grow to 9-11 billion, all of whom will need food, water and somewhere to live[16]. It seems highly unlikely that billions of people relocating would be a smooth or orderly process.

The Intergovernmental Panel on Climate Change (IPCC) reports the cost of just a 1.5°C increase in temperature by 2100 at $54 trillion[20]. This is the cost of ***controlled*** climate change — something we are not yet achieving.

b The agreement states to hold average global temperature increases to "well below 2°C above preindustrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels".

The cost of the lower end of *uncontrolled* climate change — the path we are on today — for 3.7°C warming is estimated at $550 trillion[21]. This is more than all the wealth currently existing in the world.

Of course, such analyses are inherently complex and can only give us a directional indication, not accurate forecasts. After all, how do you value the costs of global collapse? Furthermore, there are countless unknowns in the climate system, as well as the economic and biophysical responses to it. Therefore, the question is not whether these scenarios are ***certain*** on our current path. They are not. The question is whether there is a reasonable ***likelihood*** of such an outcome.

In considering that, we should remember our natural human tendency to err on assuming the more positive outcomes we hope for.

Critically, we should also note that the unknowns go in both directions — it may not be as bad as such scenarios suggest. Or it could be much, much worse.

What matters in all of the above is that any calm and measured review of the evidence of the work of the world's very best experts in science, economics, risk and all other fields lead us to a simple conclusion.

The threat we are facing on our current path presents a high likelihood — close to certainty — of catastrophic impacts lasting centuries and making life on earth very difficult. There is, on top of that, a reasonable risk of the collapse of civilisation.

Sir David Attenborough summarised the situation, in his 2018 address to the UN Climate Summit[22], Katowice, Poland:

*"Right now we are facing a manmade disaster of global scale, our greatest threat in thousands of years: climate change…"*

*"If we don't take action, the collapse of our civilisations and the extinction of much of the natural world is on the horizon."*

## HOW SHOULD WE THINK ABOUT SUCH A THREAT?

Factors that are of particular significance to the question of whether this threat justifies an emergency response include:

- The scale of the threat — which is global and negative to all countries and all people;[c]
- The length of time over which the threat will impact society — certainly many hundreds of years, possibly thousands; and
- The potential for rapid and unpredictable acceleration of the threat through system feedbacks, which could eliminate our ability to influence or control outcomes.

c Some countries and analysts argue some regions will benefit from very marginal economic issues like increased crop yields. Some argue the rich will not suffer and can protect themselves. Both of these ignore the macro-economic global impacts, which will most likely cause loss to all countries and people, and the likelihood of high levels of conflict, which will cause social and military instability and further economic loss.

As discussed, this is not a question of certainty. The system is far too complex for that. The question is whether there is a material risk of global chaos and a further risk of collapse. On that, the science and the world's best experts are strongly and clearly aligned that there ***is*** such a material risk[23].

The scale, duration and unpredictable nature of the threat does not, however, by itself, justify a conclusion that this is an emergency.

An emergency response requires two things to ***both*** be true:

1. That the threat is real, there is a reasonable likelihood of it occurring, and it will have a large and unacceptable impact; and
2. That the response necessary to address and reduce the risk requires an ***abnormal*** level of urgency, mobilisation and action. In other words, a solution cannot be delivered through normal reform processes of policy and market economics.

## CONCLUSIONS ON THE LEVEL OF THREAT OR RISK

Given what is at stake is global civilisation's capacity to develop, and possibly to survive, this is quite simply the most serious risk humankind has ever faced — certainly for many thousands of years and possibly ever.

Therefore, the likelihood dose not need to be high to justify an emergency scale of response, no matter how disruptive that response would be. But analysis of the science by world-leading experts on risk suggests the likelihood of climate change having at least very serious impacts is, in fact, very high.

While the IPCC and other experts cover the likelihood of risk in some detail from a scientific view, the World Economic Forum's annual risk report give us a perspective from experts in the world of economics and risk. The WEF 2019 Global Risk Report[24], draws on various experts including the Institute of Risk Management, to describe changes in the global risk landscape.

In the 2019 report, 'Extreme weather events' and 'Failure of climate change mitigation and adaptation' were identified as the two most ***likely*** global risks from a total of 30 risks. In addition, 'Failure of climate mitigation and adaptation' and 'Extreme weather events', were included in the top three risks that have the highest global ***impact,*** while climate-related risks were recognised as having the strongest influence (highest number and strength of connections) on other risks, particularly social and geopolitical.

Thus, we have a very large threat ***and*** high likelihood (together being materiality) supporting a conclusion that an emergency response is the only rational response to the science, but still only if urgency is ***also*** present.

# 03

# HOW LONG DO WE HAVE TO ADDRESS THIS RISK?

## DOES THE LEVEL OF RISK SUGGEST THAT WE NOW REQUIRE A FUNDAMENTALLY DIFFERENT LEVEL OF RESPONSE?

Having concluded the risk is very high — both the size of threat and the likelihood — our next question is whether the response to the risk requires an abnormal level of mobilisation and action (i.e. an emergency response), or whether it could be dealt with through the normal reform processes of policy and markets, as we are currently doing.

This is a question of both:

- Scale: how broad is the change required; and
- Speed: how fast do we need that change to have an impact.

The science, and the analysis of this science by other experts, give us clear information on both of these issues.

For example, the IPCC 1.5°C report in 2018 had a headline conclusion that we need to first cut $CO_2$ emissions by 45% by 2030 (from 2010 levels) then reduce them to zero by 2050. This compares to the globally agreed Paris climate targets which involve not a 45% reduction, but an ***increase*** in emissions by 2030.[d]

To turn this around in just a decade — from an increase to a massive decrease — would require a broad and transformational change in the direction and structure of the economy. This is sufficient by itself to justify an emergency response — an abnormal level of mobilisation — when added to the scale of risk and impacts described above. Only an emergency mobilisation could possibly achieve such a result in such a short time.

However, if we examine the actual science and work of the IPCC, we can conclude it is highly probable that this level of action considerably ***understates*** the scale and speed of change required.

d Considering *current* global policies, emission projections are predicted to be ~ 57-60 $GtCO_2e$ pa by 2030, this is an *increase* of 4-7 $GtCO_2e$ pa on approximate current emissions (2019). According to the IPCC's 1.5°C Report, if Paris pledges and targets are met, emissions are predicted to reach 54-57 $GtCO_2e$ pa by 2030, while this is lower than our current path, it is still an *increase* of 1-4 $GtCO_2e$ pa on today's emissions (~53 $GtCO_2e$). Data provided by Climate Action Tracker.

## JUST HOW URGENT IS THIS? AND HOW SHOULD WE JUDGE THAT?

There are three issues to consider in regard to the urgency of action, remembering that they all involve judgement, based on evidence:

- How conservative are the scientific models' predictions of impacts?
- How conservative is our interpretation of them? and
- What level of risk are we prepared to take, given what is at stake?

## HOW CONSERVATIVE ARE THE SCIENTIFIC MODELS' PREDICTIONS OF IMPACTS?

There is growing evidence that, while the modelled pathways of warming rates have been broadly accurate,[25] the IPCC has consistently underestimated the speed and scale of the climate impacts caused by this warming.[26]

This is understandable, given the incredible complexity of the climate system and its influence on other natural systems, the variability and limitations of models' data and the requirement for consensus among reviewers, which tend to result in understatement of the severity of impacts. This all reinforces the natural tendency of science to be conservative.

However, the consequences of this can be quite serious, as was argued in a recent report from the Breakthrough Climate Centre, **"**What Lies Beneath**"** [27]. In a summary[28] of their report, the authors said:

*"...IPCC reports also tend toward reticence and caution, downplaying the more extreme and damaging outcomes.... This is of particular concern with potential climatic 'tipping points'- passing of critical thresholds which result in step changes in the climate system...Under-reporting on these issues is irresponsible, contributing to the failure of imagination in our understanding of, and response to, climate change"...If climate policymaking is to be soundly based, "a reframing of scientific research within an existential risk-management framework is urgently required, both in the work of the IPCC and in UN climate negotiations. Current processes will not deliver either the speed or the scale of change required".*

## HOW CONSERVATIVE IS OUR INTERPRETATION OF THE SCIENCE?

How we interpret the science is a separate issue from the science itself. In this interpretation we face a further problem, particularly given that facing up to risks and threats at this scale is unprecedented and very difficult to do.

We should be aware of just how challenging it is for people to incorporate a threat of this nature fully into their thinking. As academic experts have concluded: *"even for an honest, truth-seeking, and well-intentioned investigator it is difficult to think and act rationally in regard to... existential risks"* [29]

Prof. Hans Joachim Schellnhuber is one of the world's leading scientists in climate impact research. He is Director Emeritus of the Potsdam Institute for Climate Impact and has acted as senior advisor to Pope Francis, German Chancellor Angela Merkel and the European Union. He understands the scientific process as well as anyone in the world, but is also close to political and other leaders and observes how they interpret the science.

He points out that the current climate is in *"a unique situation with no precise historic analogue"* in which *"the level of greenhouse gases in the atmosphere is now greater, and the Earth warmer, than human beings have ever experienced"*. What is at stake *"is the very survival of our civilisation, **where conventional means of analysis may become useless**"*.[30] (Emphasis added).

With respect to the science, Schellnhuber argues: *"One should not be overly critical of the IPCC, since the scientists involved are doing what scientists are expected to do, to the very best of their ability in difficult circumstances. But climate change is now reaching the end-game, where very soon humanity must choose between taking unprecedented action, or accepting that it has been left too late and bear the consequences."*[31]

Thus, we can conclude the issue is not primarily how the science is done. The problem is how we respond to it. However, even if it is understandable, the consistent pattern of underestimating impacts leaves policymakers, and all who follow the issue, with an incorrect impression of the scale of the problem and the urgency of the required action.

This is because, firstly, the science is naturally conservative on the level of risk. Then, secondly, as discussed in the previous section, we default to further understating the risk because the implications of accepting and, therefore, addressing it are disruptive, frightening or just uncomfortable.

While we cannot have certainty, we can reasonably assume, given the above, that the risk is significantly higher than is generally recognised, while noting that the generally recognised level of risk is already very high.

This reinforces an urgency conclusion because:

- It is already very urgent, using a conservative view of the risk; and
- It is likely to be far more urgent than this conservative view suggests.

## HOW MUCH RISK ARE WE PREPARED TO TAKE, AND HOW MUCH IMPACT WILL BE ACCEPTABLE?

A second key consideration for the level of urgency is the judgement we make on what level of risk we are prepared to take, and what level of impact is acceptable. What is our goal in terms of the likelihood of success of our planned response?

In this regard, and following on from the points made about conservatism on the nature and scale of the threat, it seems the public and policy makers then misinterpret even those conservative conclusions in a quite dangerous way that increases the risk of the serious and uncontrollable catastrophe of runaway climate change.

For example, as discussed above, the IPCC report on **1.5°C** was widely reported as concluding we needed to reduce $CO_2$ emissions by 45% by 2030 (compared to 2010) and then to zero $CO_2$ emissions by 2050 to keep warming below 1.5°C.[e]

However, what the report actually says, in the detail, is that this is what is required if our goal is to have around a 50% likelihood of success[f].

Given the risk is to the future stability of global civilisation, this is clearly an illogical level of action for global leaders and the market to plan for. It means we are effectively choosing to 'flip a coin' on the future of civilisation.

It is also an approach to risk that is quite out of step with any other assessment of major risk that society undertakes. No security or defence strategy, or indeed any strategy dealing with a catastrophic risk in business, would accept a plan of action that the best experts considered had only around a 50% likelihood of success.[g]

We don't need to resolve these numbers in the short term, and precision is not possible anyway in such a complex system with current knowledge and computing capacity. We do need, however, to make an intelligent judgement based on available expert advice.

Based on that, it seems ***likely*** we are seriously underestimating both the level of risk we face, ***and*** the level of urgency required.

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e It is interesting to note that in SR15, the carbon budget for a 66% chance of limiting warming to 1.5°C, is 302 GtCO2 larger than in AR5, as it assumes heavy reliance on achieving negative emissions in the future (e.g.: BECCS and reforestation), despite there being no scale programmes in place today to act on this.

f "This report defines a '1.5°C pathway' as a pathway of emissions and associated possible temperature responses in which the majority of approaches using presently available information assign a probability of approximately one-in-two (50%) to two-in-three (66%) to warming remaining below 1.5°C or, in the case of an overshoot pathway, to warming returning to 1.5°C by around 2100 or earlier". (IPCC 2018. SR15, Ch.1, pp 60). For a 50% likelihood of limiting warming to 1.5°C (based on a carbon budget of 580 GtCO2 from 2018 levels), emissions need to reach carbon neutrality in ~ 30 years (2050 – the target identified in the reports headline statement), to improve this likelihood to 66% however, carbon neutrality would need to be reached a decade earlier – 2040 (based on a carbon budget of 420 GtCO2 from 2018). (IPCC 2018. SR15, Ch.2, pp 96).

g The IPCC 1.5° report's assessment of mitigation pathway scenarios, found no pathways were available that achieved a greater than 66% probability of limiting warming below 1.5°C during the entire 21st century (IPCC 2018. SR15, Ch.2, Table 2.1, pp 100). As indicated in footnote 'f', carbon budgets (albeit with high uncertainty range) were also developed for 1.5°C. For a 50% likelihood of limiting warming (580 GtCO2 from 2018), emissions need to reach carbon neutrality in ~ 30 years (2050), but to achieve a 66% likelihood (420 GtCO2 from 2018), carbon neutrality would need to be reached a decade earlier (2040)(IPCC 2018, SR15, Ch.2, pp96).

The La Tuna Fire was a wildfire September 2017
Photo: Scott L

# 04

# CAN WE AFFORD A CLIMATE EMERGENCY MOBILISATION?

**THIS IS, IN A WAY, A VERY ODD QUESTION. CAN WE AFFORD TO TAKE ACTION TO ADDRESS AN EXISTENTIAL RISK? ONE THAT COULD TRIGGER THE LARGEST ECONOMIC CRISIS IN HUMAN HISTORY, WITH THE POSSIBLE COLLAPSE OF CIVILISATION.**

But that is the question most people ask once they accept the science and recognise its implications. It has been the question at the core of the climate debate for decades and the framing of most arguments against action, based on the assumption that taking action would negatively impact the economy. Therefore, to consider the evidence for a climate emergency, we need to address this question: Can we afford a climate emergency mobilisation?

There are two aspects to consider.

- Can we afford not to? What will happen if we don't act in this way? and
- What would the economic consequences be if we did so?

## CAN WE AFFORD *NOT* TO HAVE A CLIMATE EMERGENCY MOBILISATION?

As discussed earlier, it is clear that the path we are currently on has profound economic implications. The climate crisis presents a serious threat to global economic and social stability, which could trigger widespread geopolitical conflicts and poses a material risk of full-scale global economic collapse. This much is clear from the scientific analysis.

The science of the climate system can be relied upon because it is based on the fundamental laws of physics and chemistry. It still has areas of uncertainty and complexity but the overall conclusions provide a clear and reliable basis on which to make judgements and determine action.

Economics is not a science. It is so heavily influenced by human behaviour that forecasting the outcome from different paths is more challenging. Nevertheless, we do have enough analysis on which to make reasonably well-informed judgements, despite the uncertainty. The IPCC's analysis, for example, suggests that 1.5°C of warming would create estimated economic costs of around $54 trillion.[32] At 3.7°C this cost increases to $551 trillion[33] — equivalent to all the wealth in the world. We are currently on the path to 3°C – 5°C.

Even at this early stage of impacts, market awareness of these risks is rapidly growing.

Feike Sijbesma, CEO of Royal DSM and Chairman of the CEO Climate Leaders of the World Economic Forum, recently argued:

*"The financial world is becoming nervous. The Financial Stability Board, established by the G20, and several central banks, are warning about climate-related financial instability. Investors want companies to disclose more climate related-risks. Insurance companies warn that failure to reduce greenhouse gas emissions could result in a world that is 'pretty much uninsurable'."*

The market evidence to support Sijbesma's view is strong. Losses from the physical impacts of the climate emergency are already being felt with a five-fold increase in insured losses in the last three decades[34]. With one-third of global equity and fixed income assets in carbon exposed sectors[35], there is increasing concern that the inevitable slump in the value of fossil fuels could trigger another global financial crisis[36]. Growing awareness of this risk is, in turn, driving divestment with funds managing over $8 trillion now excluding or restricting fossil fuels[37].

Much harder to measure, but probably even more significant, is the economic cost of the political instability, geopolitical upheaval and military conflict that climate change will almost certainly bring with mass relocations, refugees and the high likelihood of ongoing food crises.

Given this wide range of economic impacts and, particularly given the near certainty of the physical forces driving them, it is hard to justify any rational argument that we can't afford a climate emergency mobilisation. In fact, the overwhelming logical conclusion is that, economically, we can't afford not to embark on such an approach.

## THE ECONOMIC CONSEQUENCES OF A CLIMATE EMERGENCY MOBILISATION

It would certainly be expensive to conduct a full-scale emergency mobilisation. However, 'expensive' is a subjective reference point. It can only be considered relative to the cost of not acting, and to the economic results of the mobilisation, including its benefits.

The whole area of modelling something that has never occurred before is challenging. There are, however, useful reference points that can guide us in regard to the costs. For example, assessments of dramatic emissions reduction programmes concluded they would require in the vicinity of 1-3.5% of GDP[38]. It is reasonable to assume a full-scale emergency mobilisation, which would be much more disruptive, would require in the range of 5-10% of GDP[39] dedicated to the task. This compares to WWII, for example, where the war effort required 30–50% of GDP, though for fewer years than a climate emergency mobilisation would likely last.

Most critically, however, is the framework in which we consider such 'costs'. Unlike war, where a large amount of the money spent is wasted in terms of economic productivity, an emergency mobilisation would:

- Be dominated by investments in productive assets;
- Deliver clearly beneficial social and economic outcomes; and
- In many cases, lower costs for both individuals and society.

Investments in new power generating capacity would bring an economic return for decades. The electrification of transport, and the shift to renewable power generation, would lower consumers' costs and dramatically reduce outdoor air pollution, which kills around 4 million people each year[h]. An emergency mobilisation would unleash innovation in technology at a massive scale that would most likely deliver lower cost and more accessible energy supplies around the world, while also enhancing energy security.

Such potential beneficial outcomes have been widely studied.[40] From this it seems likely we are underestimating the economic and social benefits of an emergency mobilisation. In summary, it could leave our energy costs lower, energy supplies more secure, our cities cleaner, more people employed, and human health improved through better diet and cleaner air.

As in all economically disruptive transformations, such as those driven by technology, there will be winners and losers. Based on the historical evidence[41], it is likely many of today's major companies won't survive the transition but will rather be replaced by new companies. This is the normal market process of creative destruction where incumbents are often replaced by disruptors. While this has social consequences that need to be managed, it is not an argument against policy change. The public good is not negatively impacted by a transition of wealth between sectors, and policy should not be designed to protect incumbents. As has been argued by others, "Policy should protect the future from the past, not the past from the future".[i]

h The World Health Organisation estimates that around 4 million people die each year from exposure to fine particles in outdoor polluted air, leading to stroke, heart disease, lung cancer and numerous other pulmonary and respiratory diseases and infections.

i The phrase "policy must protect the future from the past, not the past from the future", was originally penned by tech futurist Tim O'Reilly, in 2012, describing the challenge for regulators when confronted with the emergence of disruptive and innovative business models. This now popular phrase has proved useful in helping communicate the climate emergency and the disruptive change that comes with it. Alex Steffen's 2016 paper 'Predatory delay and the rights of future generations', used the phrase to emphasise the absurdity of global policies protecting the institutions causing the climate crisis, instead of responding to the crisis with the speed and scale that it demands. The phase was also used in a recent Breakthrough discussion paper by Spratt & Dunlop 'The third degree: Evidence and implications for Australia of existential climate related security risk'. In this instance, the phrase was used to urge governments to model future scenario planning around the climate emergency, rather than relying on historic trends.

# 05

# CONCLUSION: IS A CLIMATE EMERGENCY MOBILISATION JUSTIFIED BY THE EVIDENCE?

## BEFORE WE DRAW THE THREADS OF THIS PAPER TOGETHER, IT'S WORTH MAKING A BRIEF COMMENT ON THE IMPLICATIONS OF THE QUESTION WE ARE ADDRESSING, TO REMIND OURSELVES WHAT'S AT STAKE.

With a situation as dire as the evidence shows, society simply must not get this wrong. Facing such a time sensitive, existential risk, but failing to respond adequately, could commit humanity to widespread misery for hundreds and possibly thousands of years. It could literally change the course of evolution and human history.

This is the real-world context for the question of whether we need an emergency response to climate change. And this context must always frame our response.

So, with that in mind, what have we considered in this paper?

We first described what it means in practice to respond to a threat as an emergency. We considered actual historical responses to localised threats, like flooding or bushfire, through to more global emergencies such as WWII or the 2008 Global Financial Crisis.

What we identified from these comparisons is that shifting to an emergency mode of action ***is not*** business-as-usual, or even reform-as-usual undertaken with a stronger focus or intensity on a threat.

In an emergency, business-as-usual is suspended and an ***abnormal*** level of intensity is focused on managing the threat. This level of intensity is commensurate with the analysed threat and its likelihood and urgency.

We said that to make the decision to act in emergency mode, which is, by definition and intent, disruptive to the status quo, requires two criteria to ***both*** be satisfied:

1. That the risk or threat is clear, there is a reasonable likelihood of it occurring, and it will have a large and unacceptable impact if it does; and
2. That the response necessary to address and reduce the risk to an acceptable level requires an ***abnormal*** level of urgency, mobilisation and action. In other words, a solution cannot be delivered through normal reform processes of policy and market economics.

We examined the expert advice on the first criteria, and established that the threat is global and breath-taking in scale, with near certainty of widespread and severe impacts lasting for centuries, and a further, material level of risk of global collapse.

Short of full-scale nuclear war or a significant meteor strike, it is hard to imagine a greater threat to humanity than climate change.

We then examined the evidence on the second criteria — whether an ***abnormal*** level of urgency, mobilisation and action was required or if it could instead be addressed through the normal reform processes of policy and market economics, as we are currently doing. In other words, did we have time for the latter?

To answer this required us to determine both the scale of the action required, and the speed at which it would have to be delivered to address the level of threat.

The evidence produced by highly qualified people indicates that, at a ***minimum*** (considering the history of underestimated impacts), we will most likely need to:

- Reduce $CO_2$ emissions by ***significantly more*** than 45% in around 10 years; and
- Achieve net zero greenhouse gas (GHG) emissions ***well before*** 2050; and
- Remove warming gases from the atmosphere urgently to curtail system feedbacks; and
- Prove and scale geo-engineering solutions within a decade or two, possibly less, to cool the planet to a safe level.[j, 42]

Precision on whether the level of emissions reduction needs to be 45% or 100% by 2030, or whether the ultimate goal is to cap warming at 1.5°C or much less, does not need to be resolved at this stage. That's because ***any*** target in this range requires such dramatic deviation from 'business-as-usual', and intervention that is so much stronger than any government is planning for,[k] that it doesn't change the answer to our question of whether a climate emergency mobilisation is justified.

We can clearly see, from the evidence of other emergency responses by society, what pursuing targets, even at the bottom of that range, would mean.

It would require a high level of government intervention, backed by effective planning, policy and legislation, to drive action that is swift, resolute and impactful. The state would need to openly communicate the magnitude of the threat and consequences of inaction; and then draw on all its own resources ***and*** the full capacity of its citizens and market participants to drive an effective response.

The economic mobilisation during WWII continues to be the best reference point for the scale and pace of economic and social intervention required. The big difference in the case of the climate emergency, however, is that most of the investment in fixing the problem will come from private, not public, money. It is the market that will ultimately make the investment and divestment decisions that allocate private capital to the task of zero emissions transformation.

However, the market response today is nowhere near fast enough, nor at the scale required, to avoid a full-scale climate crisis. Therefore, if it is 'left to the market', the economy will likely collapse under the weight of climate-driven instability.

Therefore, the state needs to send crystal clear and unambiguous signals to the market to act with both urgency and intensity. These signals need to include both strong regulation and a carbon price, and clear objectives regarding the speed and scale of change required.

j It must be emphasised that none of these technologies is currently viable at scale in terms of technical effectiveness, cost, risk and governance. They also need to be addressed for their net social and environmental benefit.

k Assuming the successful implementation of planned NDC pledges made by governments under the Paris Agreement, the IPCC predicts that emissions will reach 52–58 GtCO2e yr−1 in 2030 (around double the 25-30 GtCO2e yr−1 required limit warming to 1.5°C) (IPCC 2018. SR15, Ch2, pp 95-96). With these emissions, warming will surpass 1.5°C and likely reach 3°C by 2100 with additional warming beyond (IPCC 2018. SR15, Ch1, pp 56).

In summary, the evidence clearly establishes:

- The scale and level of risk — it threatens civilisation;
- The scale of change required — the transformation of the economy; and
- The speed with which it must be delivered — largely within a decade.

Based on the evidence, even using a cautious and conservative analysis, it is clear that *only* shifting to an emergency mode of action could successfully address the existential risk that the climate crisis presents to humanity.

The economic argument for a climate emergency mobilisation is also powerful — as well as avoiding severe economic risks the evidence demonstrates that the economic and social benefits could be considerable.

What this means is we have been warned of an imminent danger. Not just a danger to our prosperity or our level of progress but a danger to the very existence of organised civilisation. We know how to fix this and we can afford to do so.

We have been told. Now we have to choose.

**"Owing to past neglect, in the face of the plainest warnings, we have entered upon a period of danger. The era of procrastination, of half measures, of soothing and baffling expedients of delays, is coming to its close. In its place we are entering a period of consequences... We cannot avoid this period, we are in it now..."**

**WINSTON CHURCHILL,**
**12 NOVEMBER, 1936**

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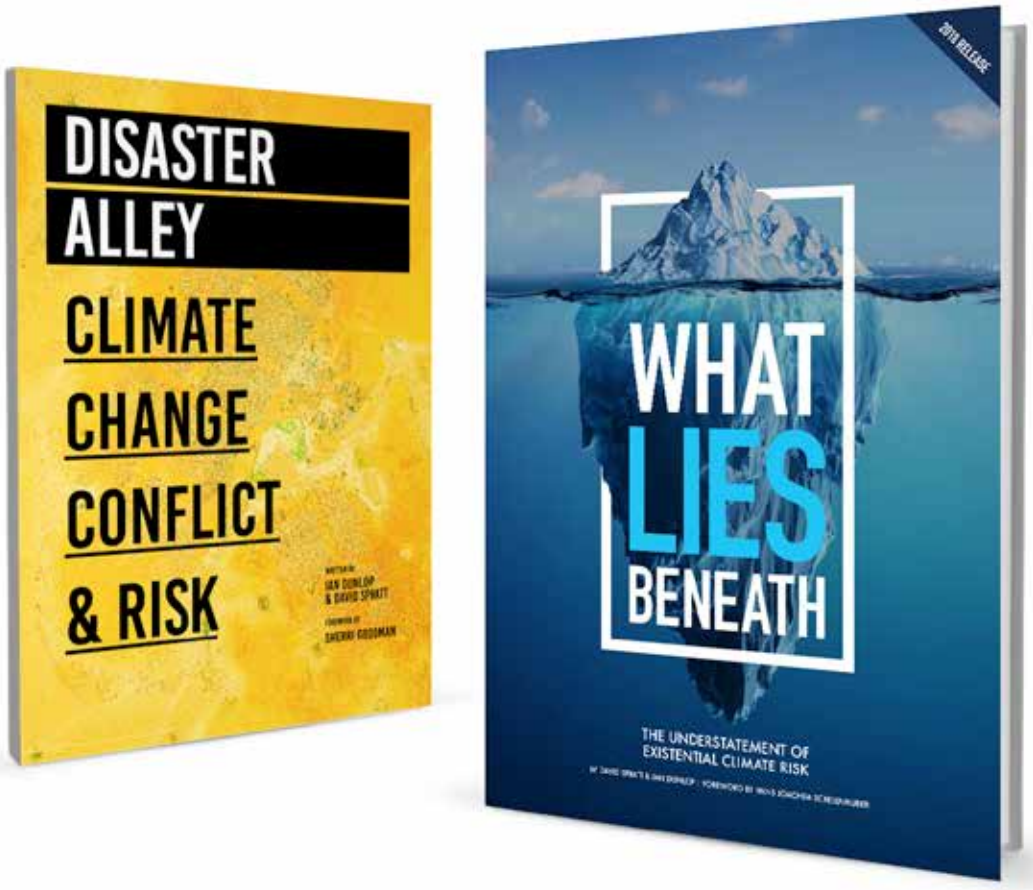


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