

# CLIMATE CHANGE: A RISK ASSESSMENT

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## POLICY BRIEF JULY 2015

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The most important political decision to be made about climate change is how much effort to expend on countering it. That decision should be informed by a full assessment of the risks. At the minimum, we have to think about three things:

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1. **what we are doing to the climate;**
  2. **how the climate may change in response, and what that could do to us; and**
  3. **what, in the context of a changing climate, we might do to each other**
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1. **What we are doing to the climate** is emitting greenhouse gases that trap heat and warm it up. Whether those emissions go up or down in future will depend mainly on the policy choices we make, and the technological progress that expands our options. Our best guess at the moment, based on current policies and trends, is that emissions will keep going up for another few decades, and then either level off, or come down slowly. This is for two reasons: governments are not making maximum use of the technologies to reduce emissions that we already have; and technology is not yet progressing fast enough to give governments the policy options they will need in the future. In the worst case, emissions could keep on rising throughout the century.

2. **How the climate may change, and what that could do to us**, are both highly uncertain. The important thing to understand is that uncertainty is not our friend. There is much more scope to be unlucky than there is to be lucky.

For any pathway of emissions through time, there are wide ranges of possible increases in global temperature and sea level. On a high emissions pathway where the most likely temperature increase is estimated to be 5°C by 2100, anything from 3°C to 7°C may be possible. However, while on this pathway the chances of staying below 3°C will become vanishingly small over time, the chances of exceeding 7°C will increase, and this extreme outcome could become more likely than not within the following century. Similarly, there is very little chance that the global sea level rise will slow down from its current rate, and every chance that it will accelerate – the only question is by how much. While an increase of somewhere between 40cm and 1m looks likely this century, the delayed response of huge ice-sheets to warming means we may already be committed to more than 10m over the longer term – we just do not know whether that will take centuries or millennia.

What may appear to be small changes in climate could have very large effects, especially if important thresholds are passed. Crops have

limited tolerance for high temperatures, and as the climate warms, these limits are likely to be exceeded increasingly often. This is one reason why a temperature increase of 4°C or more could pose very large risks to global food security. People have limited tolerance for combinations of high temperature and humidity. Although people do die of heat stress in the current climate, their upper limits of tolerance are rarely if ever exceeded by climatic conditions alone. Somewhere between 5°C and 7°C of temperature increase, it starts to become likely that hot places will experience conditions that are fatal even for people lying down in the shade. Population growth alone is likely to double the number of people living below a threshold of extreme water shortage by mid century. Climate change is likely to cause even more extreme water scarcity in some regions, while increasing the risks of flooding in others. Coastal cities probably have thresholds in terms of the rate and extent of sea level rise that they are able to deal with, but we have very little idea where those thresholds are.

3. **What, in the context of a changing climate, we might do to each other** is deeply uncertain. But we can start from the understanding that the climate hardly changed at all in the first ten thousand years of human civilization, and that even the 0.8°C of climate change we have seen so far is now causing us significant problems. It seems likely that high degrees of climate change would pose enormous risks to national and international security. Extreme water stress, and competition for productive land, could both become sources of conflict. Migration from some regions may become more a necessity than a choice, and could take place on a historically unprecedented scale. The capacity of the international community for humanitarian assistance, already at full stretch, could easily be overwhelmed. The risks of state failure could rise significantly, affecting many countries simultaneously, and even threatening those that are currently considered developed and stable.

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Clearly, there are great risks not only of economic losses, but also of human losses. How to value those losses is as much a question of ethics as one of economics.

## Recommendations for continuing risk assessment

Our climate change risk assessment is far from perfect, but we hope it will provoke thinking about how such assessments are done, who they are done by, and who they are done for. We recommend that:

- 1. The risks of climate change should be assessed in the same way as risks to national security or public health.** When we think about keeping our countries safe, we always consider the worst case scenarios. Climate change gets worse over time, so that means we have to take a long view. We can start by identifying what we want to avoid, and then asking how the likelihood of encountering it will change over time. In all three areas discussed above, our risk assessment would be strengthened if we were to use a consistent set of indicators – so we could track how expert opinion changes over time.
- 2. The risk assessment should involve a wide range of experts.** Policy analysts and energy experts should be asked where they think global emissions are most likely to be going. Political
- leaders should have a role in defining what it is we want to avoid; scientists can then assess its likelihood. Military strategists should be asked what security risks they would expect to arise from a high climate change world, and how manageable those might be.
- 3. The risk assessment should report to the highest level of government;** not only, for example, to the environment minister or to those who are responsible for planning. The most important decision – about the level of priority to give to this problem – is one that only the head of government can take. The risk assessment should be repeated regularly and consistently, so that the direction of any changes in assessment can be clearly seen.

## Risk reduction: elements of a proportionate response

An honest assessment of risk is no reason for fatalism. Just as small changes in climate can have very large effects, the same can be true for changes in government policy, technological capability, and financial regulation. Policy measures can bring down emissions directly, by regulating for cleaner energy, used more efficiently. At the same time, the right incentives can direct more investment towards clean energy technologies, accelerating innovation so that new policies become possible in future. Leadership can make this virtuous circle turn faster, more fully mobilising our ingenuity, resources and commitment. In this way, the goal of preserving a safe climate for the future need not be beyond our reach.

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