

Open Report on behalf of Keith Ireland, Chief Executive

Report to:	Environment and Economy Scrutiny Committee
Date:	27 November 2018
Subject:	Intergovernmental Panel on Climate Change - Report Global Warming Above 1.5°C

Summary:

This paper provides an overview of "**Global Warming above 1.5°C**" (the report), which was released in October, by the Intergovernmental Panel on Climate Change (IPCC). The report was commissioned by the UN to understand the impacts of 1.5°C, in comparison to 2°C, of warming on a global scale and aims to strengthen the global response to climate change, alongside the challenge of sustainable development, and the need to eradicate poverty.

Under the Paris Agreement, adopted in December 2015, 197 countries agreed to hold the rise in global average temperature to "well below 2°C above pre-industrial levels" and to pursue efforts to limit it to 1.5 °C.

The consequences of 1°C of global warming are now visible through more extreme weather, rising sea levels and diminishing Arctic sea ice, among other changes. Global events, such as the fires in California, have focussed the minds of many, as has the headline of a critical 12 year period, up to 2030, to bring about change.

Limiting global warming to 1.5°C will require rapid and far-reaching transitions in land, energy, industry, buildings, transport, and cities. Global net human-caused emissions of carbon dioxide (CO₂) will need to fall by 45 percent from 2010 levels by 2030, reaching 'net zero' by 2050. This means that any remaining emissions would need to be balanced by removing CO₂ from the air.

Limiting warming to 1.5°C is theoretically possible; however, doing so will require unprecedented changes.

Actions Required:

The Environment and Economy Scrutiny Committee is invited to consider and comment on the report and endorse the decision to join the Department for Business, Energy and Industrial Strategy 2020 Commitment.

1. Background

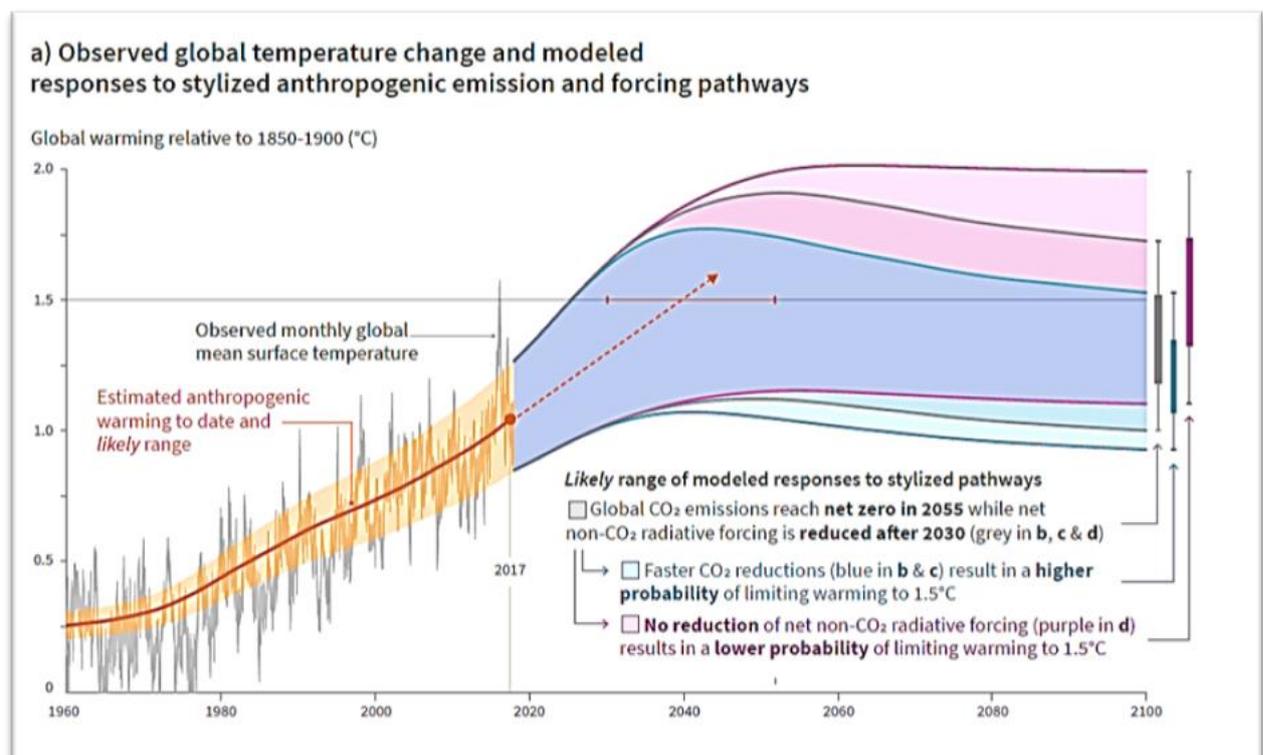
Global Warming of 1.5°C

Human activities to date are estimated to have caused approximately 1.0°C of global warming above pre-industrial levels. Based on the current trends, global warming will reach 1.5°C between 2030 and 2050. Warming resulting from emissions from the pre-industrial period to now, will continue for hundreds of years. The risk to which individuals and communities around the world will be exposed to, will vary dependent on the rate of warming, geographic location, levels of development and vulnerability, and on the choices and implementation of adaptation and mitigation options.

Projected Climate Change,

The graph below shows the expected range of temperatures we could experience under 3 different future scenarios.

The grey area shows what could happen if emissions reach zero by 2055 with drastic cuts in human emissions from 2030. The blue area shows the likely temperature range if emissions are reduced sooner, and the purple area shows what could happen if no reductions are made.



Potential Impacts and Associated Risks at 1.5°C and 2°C

Maximum temperatures on land could increase by 3°C at 1.5°C of global warming, increasing to 4°C at 2°C of global warming. Extreme cold nights in arctic regions could warm by as much as 4.5°C under 1.5°C of global warming, increasing to 6°C at 2°C of global warming. Impacts will include increases in average temperatures, hot extremes, heavy rainfall in several global areas, and a higher probability of drought and less rainfall in other areas.

The Sea

- Models suggest mean sea level rise will be between 0.26 and 0.77m by 2100 for a 1.5°C global warming.
- A reduction of 0.1 m in global sea level rise implies that up to 10 million fewer people would be exposed to related risks, based on population in the year 2010 and assuming no adaptation.
- Sea level rise will continue beyond 2100 even if global warming is limited to 1.5°C in the 21st century. Marine ice sheet instability in Antarctica and/or irreversible loss of the Greenland ice sheet could result in multi-metre rise in sea level over hundreds to thousands of years. These instabilities could be triggered around 1.5°C to 2°C of global warming.
- Arctic sea ice cover will substantially reduce with projections of one sea ice free summer every century with 1.5°C global warming, increasing to one per decade at 2°C.

Wildlife, Flora and Fauna

- Coral reefs will decline by 70-90 percent with global warming of 1.5°C, whereas virtually all (> 99 percent) would be lost with 2°C.
- Projections suggest fewer impacts on plants and animals at 1.5°C compared to 2°C. Of 105,000 species studied, 6% of insects, 8% of plants and 4% of vertebrates are projected to lose over half of their habitat for global warming of 1.5°C, compared with 18% of insects, 16% of plants and 8% of vertebrates for global warming of 2°C.
- Limiting global warming to 1.5°C compared to 2°C is projected to reduce increases in ocean temperature as well as acidity and decreases in ocean oxygen levels.
- Consequently, limiting global warming to 1.5°C is projected to reduce risks to marine biodiversity, fisheries, and ecosystems, and their functions and services to humans.

What level of Greenhouse gas emissions are required to limit warming to 1.5°C?

In order to limit warming to 1.5°C global carbon dioxide emissions must decline by 45% from 2010 levels by 2030, reaching zero emissions by 2050. In order to limit warming to 2°C, global carbon dioxide emissions must decline by 20% by 2030 and reach net zero by 2075. Limiting warming to 1.5°C will require huge changes in energy, land, infrastructure, planning, and changes to industrial systems at a previously unseen scale and investment levels.

Energy

- 1.5°C warming with little or no overshoot would require a reduction in demand for electricity alongside faster electrification of energy end use.
- It is anticipated that renewables will make up between 70-85% of the global energy mix, with 8% from oil and 0 – 2% of coal by 2050. Nuclear and fossil fuel with carbon capture and storage will also increase to meet demand.
- Energy related mitigation measures will require \$900 billion USD per year investment until 2050 to achieve 1.5°C global warming.

Industry, Infrastructure and Land Use

- Industry will be required to reduce carbon dioxide production by 65 - 90%, meeting 2°C will require reductions of 50-80%.
- In the transport sector, the share of low-emission vehicles would rise from less than 5% now to about 35–65% in 2050 compared to 25–45% for 2°C global warming. In the UK the transport system will be largely decarbonised by 2040.
- Around 8 million km² (800million ha) of agricultural land will need to be converted to around 7 million km² of energy crops and the rest being used to increase forest cover to 10 million km² by 2050 to achieve 1.5°C global warming.
- Carbon dioxide removal maybe required on a large scale (100- 1000Gt carbon dioxide by 2100) unless significant emissions reductions are seen in the next decade, and measures are put in place to lower energy and land demand.

Strengthening the Global Response in the Context of Sustainable Development and Efforts to Eradicate Poverty

Commitments made under the Paris Agreement are very challenging but will still expose the planet to the risks associated with 2°C of warming. The report drives from more ambitious change while recognising the need to undertake this change in the context of sustainable development and the UN's ambitions to eradicate of poverty.

Mitigation and Adaptation

Links between: adaptation, mitigation (decarbonising, transport, energy systems, agriculture and industry) and sustainable development principles will all be required to address the challenges outlined. The report suggests that investment of ~2.5% global GDP will be required, alongside legislation, local knowledge and community approaches to behaviour change, with local level partnerships across sectors facilitating actions.

2. Next Steps: Opportunities for Action: Lincolnshire County Council – mitigation, adaptation and leadership

Mitigation

Strong progress has already been made in reducing carbon emissions by LCC as demonstrated by the success of the first two Carbon Management Plans. The soon to be published Third Carbon Management Plan will support the ongoing emissions reduction for the authority.

In addition to the Carbon Management Plan, the Government has challenged the public sector to make a public commitment via the Department for Business, Energy and Industrial Strategy (BEIS). The BEIS **Emissions Reduction Pledge 2020** requires bodies to: develop and implement the business case for measuring and reducing energy use, costs and carbon emissions in their organisation. FOR LCC much of this will be captured within our Carbon Management Plan (III). However, signing up to the pledge will demonstrate leadership and commitment towards helping the UK to achieve the set targets within the Climate Change Act

2008. Lincolnshire County Council will also support other public sector bodies in the County with this work as part of the leadership on this issue.

Adaptation

Lincolnshire County Council has taken a proactive approach to adaptation in some areas, for example: development management and the floods and water agenda. However, adaptation needs to form a strong element of consideration across service areas to ensure good outcomes for our communities and value for money for monies invested.

Leadership & Policy Development

A partnership approach which mainstreams mitigation and adaption to climate change is required if Lincolnshire County Council is to lead, drive and enable change. A number of key areas of current activity will reflect this agenda, including: Local Industrial Strategy, Energy Strategy, the Waste Strategy and the upcoming Flood Risk Strategy.

3. Background Papers

No background papers within Section 100D of the Local Government Act 1972 were used in the preparation of this report.

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