Climate Change

Increasing concentrations of greenhouse gases in the atmosphere are driving a rise in average global temperatures and complex changes in the Earth's climate, with major implications for both the natural and built environment.

Global average temperatures are rising at rates unprecedented in human history. This trend is likely to continue and accelerate over the course of this century and beyond.[1]

It is extremely likely that human activity is the dominant cause of this warming. Rapid growth and development since the Industrial Revolution, fuelled by coal, oil and natural gas, has resulted in rising emissions of greenhouse gases such as carbon dioxide, increasing concentrations in the atmosphere and trapping more heat. Land use change has also reduced the extent of forests, peatlands and other features which absorb carbon and regulate climate.[1]

Global impacts are expected to include changes in rainfall patterns, more frequent, extreme weather, reduced ice on land and sea, and rising sea levels. Many of these trends are already being observed.[1] In the UK, average temperatures are likely to be 2-5°C higher by 2080, with hotter and drier summers, warmer and wetter winters, and increased risk of heat waves, floods and water shortages.[2] Around 2,000 people in the UK died as a result of the 2003 heatwave, while flooding cost an average of £1.5 billion per year over the last 20 years.[3] Such extremes could become more common in future.

There are serious implications for water supplies, food production, ecosystem stability, and human health and wellbeing.[4] Not all of the impacts will be negative however; climate change could have beneficial effects and the way we respond will also create opportunities to grow the economy, improve environmental quality and raise living standards.

Radical and urgent action is needed at the international, national and local levels to mitigate our impacts on the climate by reducing emissions and adapt to the changes that are already inevitable. While this will require significant investment, the economic benefits of doing so are expected to substantially outweigh the costs.[5,6]

Challenges

* Will the political will, international cooperation and mitigation measures available be sufficient to avoid dangerous climate change?

* How should we plan for adaptation and prioritise investment in the face of uncertain climate projections?

* How can we maximise the benefits and strengthen the business case for action?

Key Facts:

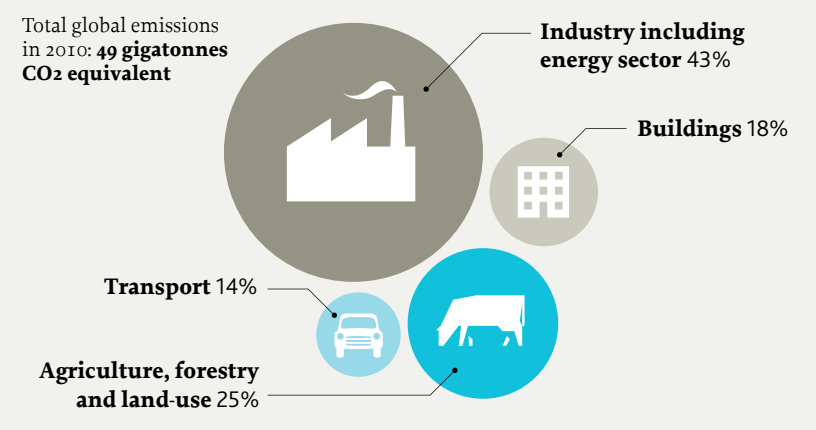
1. Temperatures have already risen by around 1°C compared to pre-industrial levels.[7] This is halfway towards the limit of 2°C warming considered necessary to avoid dangerous climate change.[8]

2. Global annual emissions of greenhouse gases are still rising, at a rate which could cause global average temperatures to rise by 4°C or more by the end of the 21st century[5]

3. 2014 was the warmest year since records began in 1880, with 13 of the warmest 15 years occurring since the year 2000[9]

4. Developed economies have the highest emissions per capita and are responsible for the majority of carbon emissions to date.[10]

5. Developing countries are the most vulnerable to the effects of climate change, and have been estimated to face 75-80% of the global costs of damages caused by climate change.[11]



LDA Design Insights:

★ Efforts to reduce carbon emissions and adapt to climate change will increasingly drive major development and infrastructure investment. Priorities include low carbon power and heat, public transport, walking and cycling networks, efficient and resilient buildings, upgrades to energy and water storage and supply infrastructure, sustainable drainage systems, and enhanced flood defences.[12]

★ There will be rewards for those who take the initiative. For example, the UK low carbon economy employs around half a million people. It contributed around £45 billion GVA to the UK economy in 2013, demonstrating an average growth rate of over 8% year on year.[13] Growth is also strong in international markets. In addition to direct commercial opportunities, taking action will reduce ongoing risk and costs for businesses and their customers.

★ Partnership working between the public and private sectors and genuine community engagement will be essential to catalyse action. To provide the right framework for investment, planners and decision-makers need to consider long-term climate scenarios and take a flexible approach which allows for uncertainty. Short-term priorities include win-win actions that are beneficial whatever the outcome, and building resilience into new projects with a long lifetime from the outset, such as property development and utilities or transport infrastructure.

★ A spatial understanding of where the risks and opportunities for adaptation and mitigation are concentrated will enable action to be targeted where it is most needed and identify opportunities to shape investment, economic and regeneration strategies and local development plans.

★ Working with natural processes and the landscape will lead to more sustainable outcomes. For example, urban green infrastructure, improvements in rural land management, and restoration of natural habitats such as coastal salt marsh can all contribute to adaptation. These measures are relatively low cost, improve the setting for development, and can address other objectives such as economic regeneration, health and wellbeing, and conservation targets.

★ The supply chain also needs to be taken into account. Embodied carbon in construction products and materials should be considered, while timber and other natural resources should be sustainably sourced. Extreme weather could also disrupt overseas manufacturing and international trade.

What is LDA Futures?

The world is changing in response to a set of environmental, economic, social and technological drivers, and these are shaping the types of infrastructure and development we need and the way we use land.

LDA Futures explores these drivers and their implications to enable us to make appropriate responses through our projects and the advice we give to clients.

References

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