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The Truth about the Human Influence on Climate Change

10 months ago

In April, Alan Stenson, CEO, Neutral Carbon Zone, took to the stage in the Social Enterprise Village at The Workplace Event 2025 in Birmingham.

He joined a panel of experts to discuss *Net Zero: Overcoming Barriers and Unlocking Opportunities for Social Enterprises in the FM Supply Chain.*

The panel included:

- Mark Hand, Sector Director – Mobilityways
- Nolan Wright, Director, Supply Chain Operations – Belu
- Sarah Morrison, Sustainable Travel Lead – Lloyds Banking Group

As a follow up to this insightful session, we thought it would be apt to share a recent article written by Alan which takes a closer look at the impact humans have on climate change.

Despite overwhelming scientific consensus, some still argue that climate change is just a natural

phenomenon, unaffected by human activity.

This perspective overlooks a vast body of evidence demonstrating the significant role humans play in altering our planet's climate. Drawing from two decades of experience in carbon management and sustainability, I delve into the clear, observable evidence of human-induced climate change to try and provide some clarity in a world full of misinformation.

The Science is Clear: Human Activities Drive Climate Change

The Earth's climate system is sensitive to changes in greenhouse gas (GHG) concentrations. GHGs like carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) trap heat in the atmosphere, a completely natural process known as the greenhouse effect. However, since the Industrial Revolution, human activities have significantly increased GHG concentrations, significantly intensifying this effect.

Carbon Dioxide (CO_2): The Primary Culprit

CO_2 accounts for approximately 76% of global GHG emissions. The burning of fossil fuels, i.e. coal, oil, and natural gas for energy and transportation, is the primary source. Atmospheric CO_2 levels have risen from about 280 parts per million (ppm) in pre-industrial times to over 430 ppm today, a level unprecedented in at least 800,000 years.

Methane (CH_4): A Potent Greenhouse Gas

Methane, while less abundant than CO_2, is over 25 times more effective at trapping heat over a 100-year period. Major sources of this include livestock digestion, rice cultivation, and fossil fuel extraction. Since pre-industrial times, atmospheric methane concentrations have more than doubled.

Nitrous Oxide (N_2O) and Industrial Gases

N_2O, primarily released from agricultural activities and industrial processes, has a global warming potential approximately 298 times that of CO_2. Additionally, industrial gases like hydrofluorocarbons (HFCs), though present in smaller quantities, have thousands of times the warming potential of CO_2.

Observable Evidence of Human-Induced Climate Change

Climate change is not a distant threat; its impacts are evident and measurable today.

1. Rising Global Temperatures

Global average temperatures have increased by approximately 1.2°C since pre-industrial times. The past decade has been the warmest on record, with 19 of the 20 warmest years occurring since 2001. This rapid warming correlates closely with the rise in GHG emissions from human activities.

2. Ocean Warming and Acidification

Oceans absorb over 90% of the excess heat from GHGs, leading to rising sea temperatures and widespread coral bleaching. They also absorb about 25% of emitted CO_2, resulting in acidification that threatens marine ecosystems. These changes disrupt marine life and fisheries, impacting food security globally.

3. Melting Ice and Rising Sea Levels

Satellite observations reveal significant ice mass loss from Greenland and Antarctica, contributing to sea-level rise. Since the early 20th century, global sea levels have risen by about 20 cm, with the rate accelerating in recent decades. This poses a threat to coastal communities worldwide.

4. Increased Frequency of Extreme Weather Events

The frequency and intensity of extreme weather events such as heatwaves, hurricanes, floods, and droughts have all increased. For instance, a study by the World Weather Attribution group found that a severe storm in the Mississippi Valley in April 2025 was made significantly more likely and intense due to human-induced climate change. Such events result in loss of life, economic damage, and displacement. World Weather Attribution+3The Guardian+3AP News+3

The Human Fingerprint: How We Know It's Us

Critics often argue that climate change is just part of natural variability. Let me be clear on this, while natural factors like volcanic activity and solar radiation do affect the climate, they cannot explain the current rapid warming.

1. Isotopic Evidence

Carbon from fossil fuels has a distinct isotopic signature. The carbon released from burning fossil fuels contains less of the carbon-14 isotope compared to naturally occurring carbon. Atmospheric measurements clearly show a decline in carbon-14 levels as CO_2 concentrations increase—directly tying fossil fuel combustion to rising CO_2.

2. Tropospheric and Stratospheric Temperature Differences

If global warming were due to solar activity, both the troposphere (lower atmosphere) and stratosphere (upper atmosphere) would warm. However, satellite data shows the opposite: the troposphere is warming while the stratosphere cools—an unmistakable sign of the greenhouse effect, driven by human emissions.

3. Climate Models and Predictions

Climate models, developed and tested over decades, consistently predict the warming patterns we are experiencing when human factors are included. Models that exclude human influences show negligible warming, further confirming our role.

Linking Human Activity to Climate Change

Attribution science allows us to assess the extent to which human-induced climate change influences specific weather events. By comparing observed events with climate models, scientists can determine the likelihood and severity of events in a warming world. This field has provided compelling evidence linking human activities to increased risks of extreme weather. Carbon Brief+7Wires+7State of the Planet+7

Addressing Common Misconceptions

“Climate Has Always Changed”

While Earth’s climate has undergone natural changes over geological timescales, the current rate of warming is unprecedented. Natural factors cannot explain the rapid temperature rise observed since the Industrial Revolution.

“Human Impact is Negligible”

Human activities may seem small compared to Earth’s vast systems, but their cumulative effect is significant. The massive scale of fossil fuel combustion, deforestation, and industrial processes has altered the atmospheric composition, leading to climate change.

“Weather Variability Disproves Climate Change”

Weather refers to short-term atmospheric conditions, while climate is the long-term average of weather patterns. Short-term variability does not negate the long-term trend of global warming.

The Importance of Acknowledging the Human Impact

Recognising human responsibility for climate change is crucial for implementing effective mitigation and adaptation strategies. It enables the development of policies aimed at reducing emissions, transitioning to renewable energy, and enhancing resilience to climate impacts.

Taking Responsibility for Our Future

The evidence is clear: human activities are the primary driver of recent climate change. Acknowledging this fact is the first step toward meaningful action. By reducing emissions, embracing sustainable practices, and investing in climate resilience, we can mitigate the worst impacts and build a sustainable future for generations to come.

Note: This article is based on current scientific understanding and aims to provide a clear, evidence-based overview of human-induced climate change. For further reading, consult reputable sources such as the Intergovernmental Panel on Climate Change (IPCC) and NASA’s climate science resources.