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6. Indicators Of Global Climate Change (IGCC) 2025 – Humanity's Highest Ever Heat Contribution – Reports

An independent team of global climate scientists has published the latest edition of the Indicators of Global Climate Change (IGCC) annual study, delivering a stark and unambiguous warning – the heat added to Earth's atmosphere by human activities reached its highest recorded level in 2025. The report provides fresh empirical evidence that the climate crisis is deepening even as international negotiations struggle to produce commensurate action.

1. About the IGCC Study

The Indicators of Global Climate Change (IGCC) is an independent scientific project initiated in 2023 and published in the peer-reviewed journal Earth System Science Data. It is managed by a global consortium of climate scientists, many of whom serve as lead authors in the United Nations' Intergovernmental Panel on Climate Change (IPCC). The IGCC fills a critical institutional gap in global climate governance – while the official IPCC Assessment Reports are published only once every five to seven years, the IGCC delivers a rigorous annual diagnostic using the same methodological standards as the IPCC. This enables policymakers, negotiators, and civil society to work with current, empirically grounded data rather than assessments that may be several years old in a rapidly shifting climate landscape.

2. Key Findings of the IGCC 2025 Report

The 2025 report presents a deeply concerning picture across multiple indicators.

1. **Temperature Spike** – The Earth's average surface temperature in 2025 was 1.39°C above the pre-industrial baseline, defined as the average temperature recorded between 1850 and 1900 – the reference period used in climate science to measure human-caused warming.
2. **Human Footprint** – Of the total 1.39°C rise, human activities accounted for 1.37°C – an overwhelming 98.6% of the total observed warming. Natural climate variability contributed only 0.02°C. This near-total dominance of anthropogenic factors in observed warming is among the most definitive empirical refutations of climate change scepticism.
3. **Historical Trend** – The human share of warming has grown steadily over successive years, demonstrating that warming is not cyclical or random – it is a directional, human-driven process with accelerating momentum.

3. Why 2025 Was Not the Hottest Year on Record

A surface-level paradox emerges from the IGCC data – despite human heat contribution reaching an all-time high, 2025 ranked only as the third warmest year on record, behind 2024 and 2023. The explanation lies in a natural ocean-atmosphere cycle – La Niña.

During La Niña conditions, surface waters in the central and eastern equatorial Pacific Ocean become significantly cooler than normal. This extensive pool of cold ocean water acts as a massive planetary heat absorber, drawing warmth from the atmosphere and temporarily suppressing global average surface air temperatures. La Niña essentially masked the underlying force of human-caused warming in 2025. The IGCC scientists are clear – without La Niña's cooling influence, 2025 would have comfortably broken all previous global temperature records.

This finding is scientifically significant because it illustrates how natural variability can temporarily obscure — but never reverse — the long-term warming trend driven by greenhouse gas accumulation in the atmosphere.

4.About La Niña and the ENSO Cycle

La Niña is the cool phase of the El Niño–Southern Oscillation (ENSO) — the dominant mode of inter-annual climate variability on Earth.

1. La Niña occurs when stronger-than-normal trade winds push warm surface water westward across the equatorial Pacific, allowing cold deep-ocean water to rise through a process called upwelling in the eastern Pacific.
2. This cooling of Pacific surface waters influences global atmospheric circulation patterns, affecting precipitation, temperature, and extreme weather events across every continent.
3. La Niña is generally associated with a temporary cooling influence on global average temperatures by diverting heat into ocean depths, though it does not arrest the long-term trend of human-induced warming.
4. For India specifically, La Niña conditions are typically associated with a stronger monsoon, above-normal rainfall, and elevated flood risk in certain regions.
5. El Niño — the opposite warm phase — produces the reverse effects - warmer Pacific waters intensify global temperature anomalies and are historically linked with weak, deficient Indian monsoons, drought conditions, and elevated heat extremes.

5.Three Major Concerns Raised by Scientists

The IGCC 2025 report identifies three interconnected warning signals that demand urgent policy attention.

1. **Record Greenhouse Gas Emissions** - Global greenhouse gas emissions reached an all-time high of 56.8 billion tonnes of carbon dioxide equivalent in 2025. Despite decades of international climate commitments, global emissions continue to rise in absolute terms, indicating a fundamental disconnect between policy ambition and energy system transformation on the ground.
2. **Rapidly Exhausting Carbon Budget** - The concept of a carbon budget — the total cumulative amount of CO₂ that can be emitted while keeping warming below a given threshold — is central to climate policy. To maintain a reasonable probability of limiting warming to 1.5°C above pre-industrial levels (the more ambitious Paris Agreement threshold), only approximately 130 billion tonnes of additional CO₂ can be emitted globally starting from 2026. At the current record-breaking emission pace of 56.8 billion tonnes per year, this entire remaining budget will be consumed in under three years. This is not a distant, hypothetical risk — it is an immediate, arithmetic reality.
3. **Accelerating Rate of Warming** - The Earth is currently heating at a rate of 0.27°C per decade — a pace that, if sustained, implies profound consequences for sea level rise, extreme weather frequency and intensity, ecosystem collapse, and human displacement well within the lifetimes of people alive today.

6.The Threat of El Niño

Compounding these concerns, scientists warn that a powerful El Niño cycle is building in the Pacific. El Niño releases vast quantities of stored ocean heat into the atmosphere, producing a temporary but dramatic spike in global temperatures on top of the existing human-caused baseline warming. Climate scientists estimate a 91% probability that at least one year before 2030 will breach the 1.5°C warming threshold when the forthcoming El Niño combines with the existing trajectory of human emissions. Crossing this threshold — even temporarily — carries serious implications for climate tipping

points, including Arctic permafrost destabilisation, Amazon dieback, and disruption of major ocean circulation systems.

7.Way Forward – Policy Responses

At the mid-year climate negotiations in Bonn, Germany, climate diplomats have proposed a concrete structural target to accelerate the clean energy transition.

1. **The '35% by 2035' Electrification Target** – Countries are advancing a global commitment to ensure that electricity accounts for at least 35% of all final energy consumed by 2035. Currently, electricity constitutes only 20% of global energy use, with the remainder dominated by direct combustion of oil in transport and coal and gas in industry. Significantly expanding the electricity share of the energy system is the most practical available pathway to eliminating fossil fuel dependence at scale.
2. **Green Energy Acceleration** – This electrification strategy only delivers climate benefits if the electricity generated is itself clean. Countries must therefore simultaneously scale solar, wind, and green hydrogen generation at an unprecedented pace to ensure that the expansion of electricity use displaces, rather than supplements, fossil fuels.
3. **Adaptation Imperative for India** – India faces a particularly urgent challenge. As a rapidly developing economy with a large proportion of its urban population already exposed to dangerous heat extremes, the shrinking carbon budget means the window for incremental action has effectively closed. India must aggressively scale local climate adaptation – urban heat island mitigation, green infrastructure, early warning systems, and heat action plans – while simultaneously accelerating its renewable energy transition. Additionally, India must leverage its standing in multilateral climate forums to press developed nations to deliver on overdue commitments for climate finance to developing countries.

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