Climate Change Report 2024

Executive Summary

Climate change continues to be one of the most pressing challenges facing our planet. Global temperatures have risen by approximately 1.2 degrees Celsius since pre-industrial times. This report examines the key findings from recent climate research and provides recommendations for mitigation and adaptation strategies.

Key Findings:

1. Global Surface Temperature: The global mean surface temperature in 2024 was approximately 1.45°C above the 1850-1900 average, making it one of the warmest years on record.

2. Sea Level Rise: Global mean sea level has risen by about 3.4 mm per year since 1993, with acceleration observed in recent decades due to thermal expansion and ice sheet melting.

3. Arctic Ice: Arctic sea ice extent continues to decline, with summer minimums reaching record lows. The Arctic is warming nearly four times faster than the global average.

4. Extreme Weather: The frequency and intensity of extreme weather events, including heatwaves, droughts, and heavy precipitation, have increased significantly in recent decades.

Recommendations

Based on our analysis, we recommend the following actions:

1. Renewable Energy Transition
- Accelerate the shift from fossil fuels to renewable energy sources
- Target: 80% renewable electricity by 2035
- Investment needed: $4 trillion globally per year

2. Energy Efficiency
- Implement stricter building codes for energy efficiency
- Promote electric vehicles and public transportation
- Reduce industrial energy consumption by 30%

3. Carbon Capture
- Deploy carbon capture and storage technologies at scale
- Invest in direct air capture research and development
- Target: Remove 10 gigatons of CO2 annually by 2050

4. Adaptation Measures
- Strengthen infrastructure resilience to extreme weather
- Develop drought-resistant crop varieties
- Implement early warning systems for climate disasters

5. International Cooperation
- Strengthen commitments under the Paris Agreement
- Increase climate finance for developing nations
- Share technology and best practices globally

Conclusion:
Addressing climate change requires immediate and sustained action across all sectors. The cost of inaction far exceeds the investment needed for mitigation and adaptation.