



Key findings from the IPCC Fourth Assessment Report

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**US Senate Committee on
Environment and Public Works**

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**PLENARY
approves outline**

**PLENARY
Accepts/approves
report**

**Authors
selection**

**Government
distribution**

**1st
DRAFT**

**2nd
DRAFT**

**FINAL
DRAFT**

**Expert
review**

**Expert +
government
review**

Peer reviewed scientific technical literature

Review process of the IPCC assessment reports

1. **Experts** review the first draft of the report
 2. **Governments** and **experts** review the second draft of the report and the draft Summary for Policymakers
 3. **Governments** review word-by-word the revised draft Summary for Policymakers
- **Review process ensures scientific integrity, objectivity, openness and transparency**

Endorsement within the scientific community

Over recent years the IPCC has effectively become the **voice of the mainstream scientific community**

In the US, the IPCC has been repeatedly vetted and endorsed by:

- the National Academy of Science
- the American Meteorological Society
- the American Geophysical Union
- the American Association for the Advancement of Science

Evolution of climate science

Deeper understanding and quantification of the processes governing the climate system have progressed rapidly since the IPCC First Assessment Report (1990)

- These advances have arisen from new data, more sophisticated analyses of data, improvements in understanding and simulation of physical processes and more extensive exploration of uncertainty ranges

The increased confidence in climate science is evident in the **IPCC's Fourth Assessment Report**

The IPCC Fourth Assessment Report (AR4)

Process

- +2500 scientific expert reviewers
- 800 contributing authors
- 450 lead authors from
- +130 countries

Authors, Contributors, Reviewers and other Experts

They are selected by the Working Group Bureaus from **nominations received from governments** and participating organizations or identified directly, because of their special expertise reflected in their publications and works

The composition of lead author teams for chapters of IPCC reports shall reflect a range of views, expertise and geographical representation

They work on a **voluntary** basis

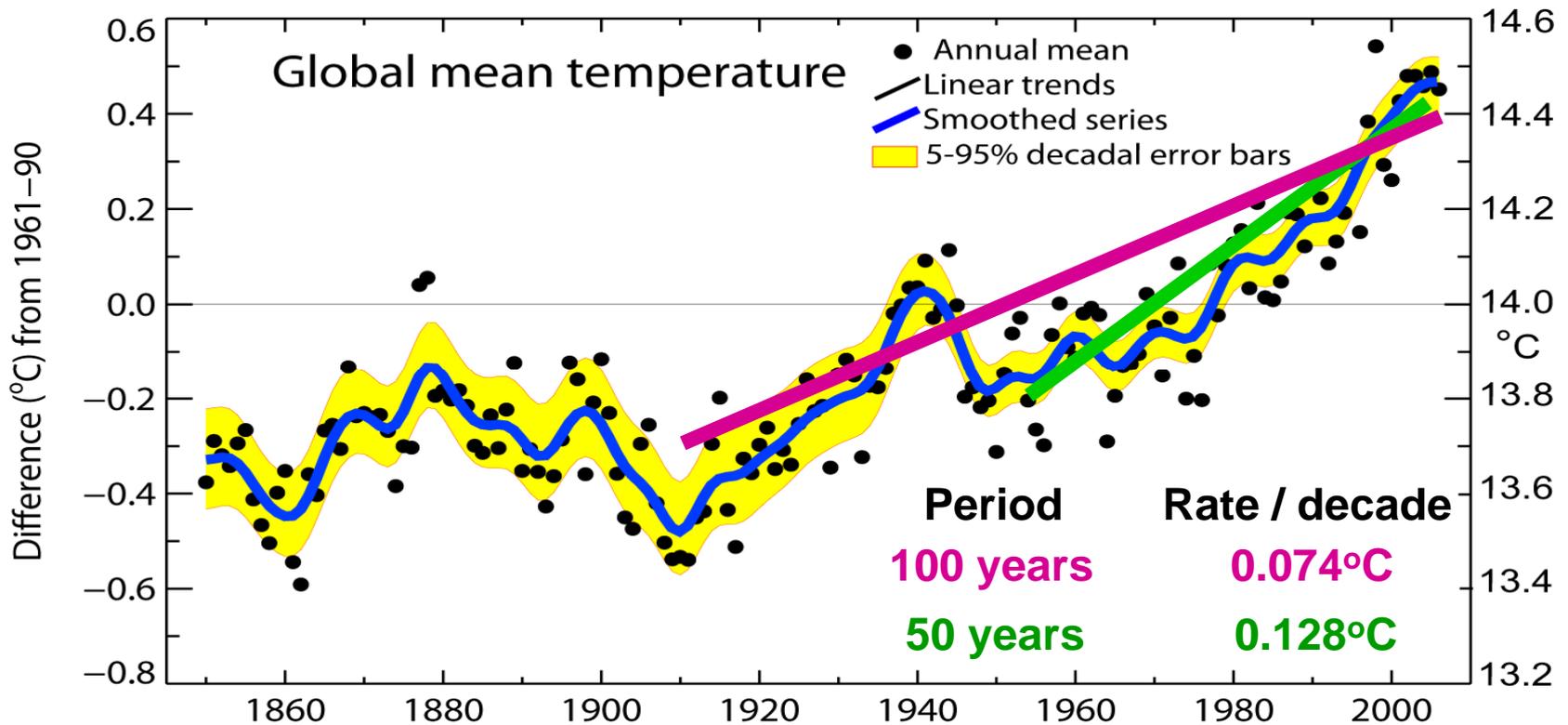
Scientists from the US who worked on the IPCC Fourth Assessment Report

	CLA	LA	RE	CA	Reviewers	Grand Total
WGI	10	32	6	181	188	
WGII	7	15	7	43	209	
WGIII	5	21	3	30	68	
TOTAL	22	68	16	254	465	825

Key findings of the IPCC Fourth Assessment Report:

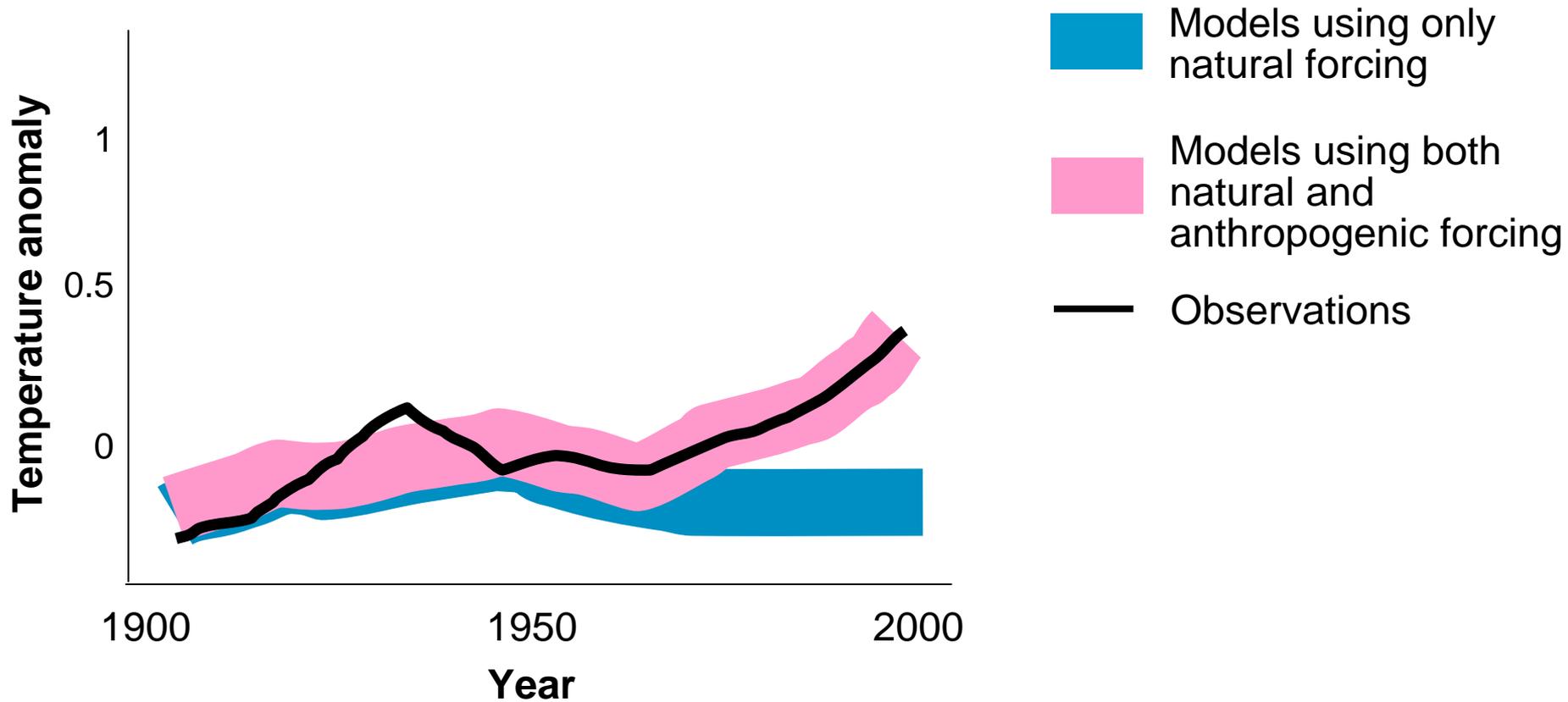
“Warming of the climate system is unequivocal”

Changes in global average surface temperature



Eleven of the last twelve years rank among the twelve warmest years in the instrumental record of global surface temperature

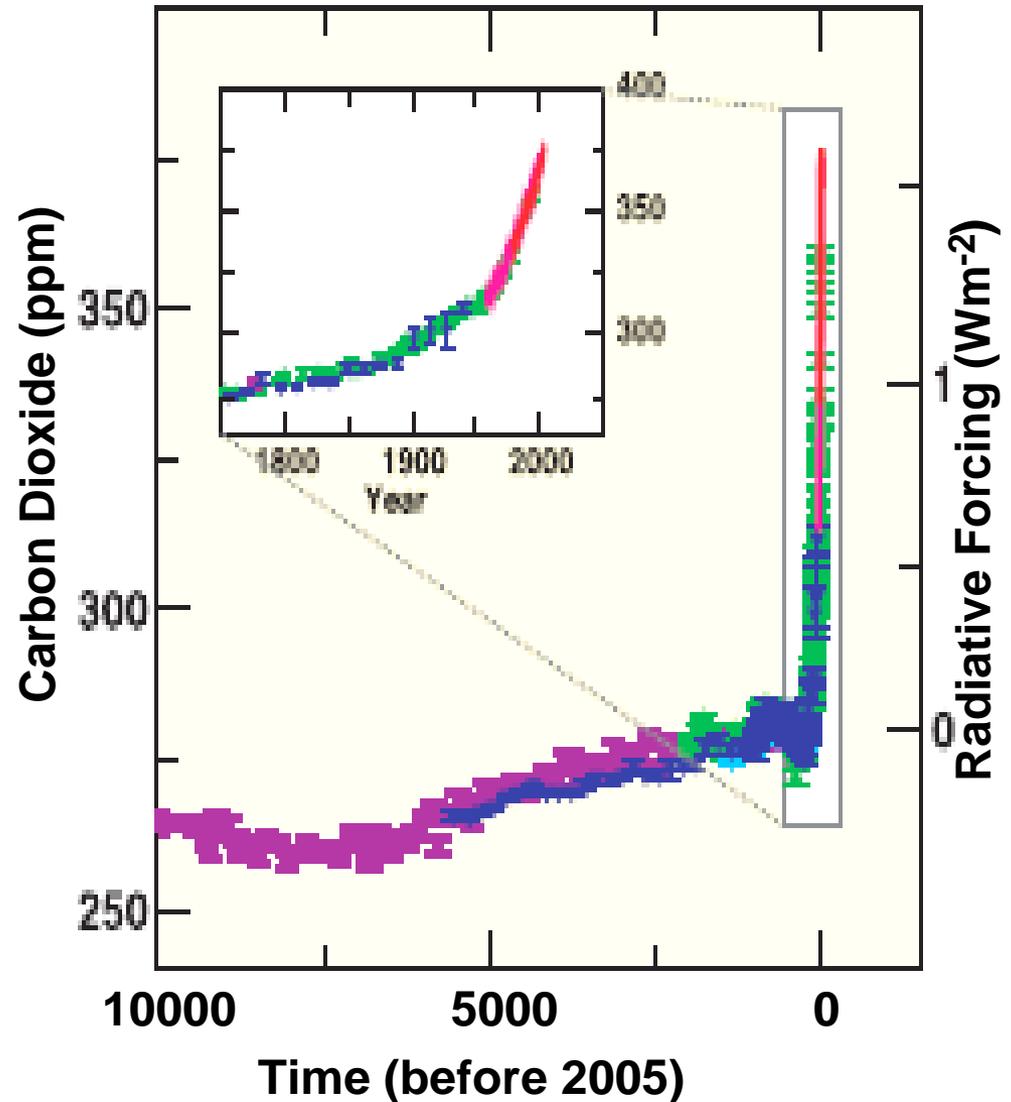
Global temperature change



Carbon dioxide emissions

Global atmospheric concentrations of greenhouse gases (GHG) increased markedly as a result of human activities, with an increase of **70% in 1970-2004**

U.S. emissions have risen by **14.7% in 1990-2006***



Expected impacts on poor regions

People exposed to increased **water stress** by 2020:



- 120 million to 1.2 billion in Asia
- 12 to 81 million in Latin America
- 75 to 250 million in Africa

Possible **yield reduction** in agriculture:



- 30% by 2050 in Central and South Asia
- 30% by 2080 in Latin America
- 50% by 2020 in some African countries

Crop revenues could fall by 90% by 2100 in Africa

Key findings of the IPCC Fourth Assessment Report:

“Delayed emission reductions significantly constrain the opportunities to achieve lower stabilisation levels and increase the risk of more severe climate change impacts”

Stabilisation scenarios

Global mean temp. increase (°C)	Stabilization level (ppm CO ₂ -eq)	Year CO ₂ needs to peak
2.0 – 2.4	445 – 490	2000 – 2015
2.4 – 2.8	490 – 535	2000 – 2020
2.8 – 3.2	535 – 590	2010 – 2030
3.2 – 4.0	590 – 710	2020 – 2060

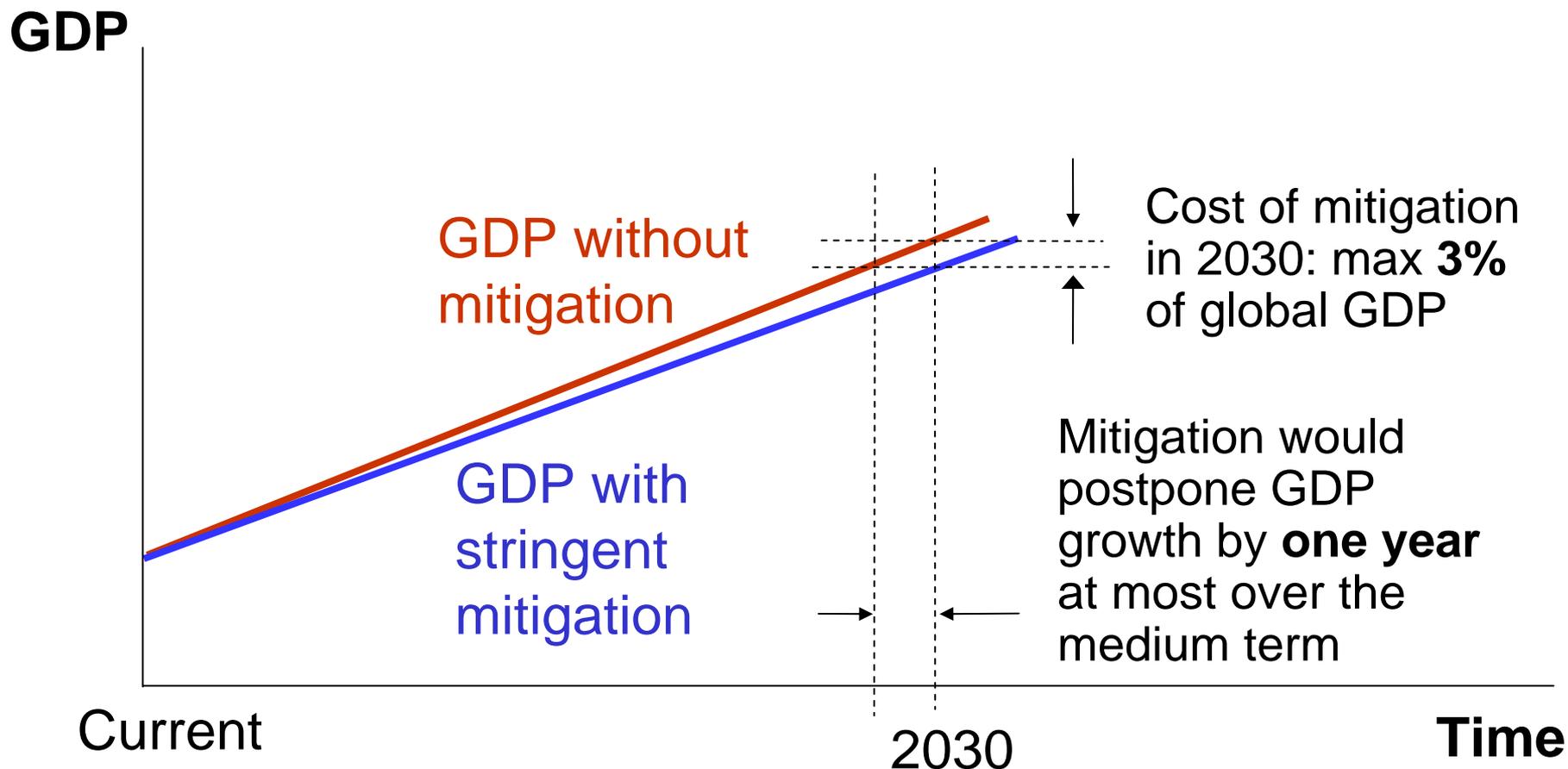
Costs of mitigation in 2030

Stabilisation levels (ppm CO ₂ -eq)	Range of GDP reduction (%)	Reduction of average annual GDP growth rates (percentage pts)
445 - 535	< 3	< 0.12
535 - 590	0.2 – 2.5	< 0.1
590 - 710	-0.6 – 1.2	< 0.06

Mitigation measures would induce 0.6% gain to 3% decrease of GDP in 2030

Impacts of mitigation on GDP growth

(for stabilisation scenario of 445-535 ppm CO₂-eq)



Main co-benefits of mitigation

- ✓ **Health** co-benefits from reduced air pollution
 - Benefits range from 30-50% of estimated mitigation costs up to a factor of 3 to 4
- ✓ More **employment**
 - Solar PV and wind-energy generate 5.7 person-years of employment per 1 million US\$ investment (over ten years); while coal industry generates only 4
- ✓ Increased **energy security**
- **Mitigation actions can result in near-term co-benefits that may offset a substantial fraction of mitigation costs**



All stabilisation levels assessed can be achieved by deployment of a portfolio of **technologies that are currently available or expected to be commercialised** in coming decades

This assumes appropriate and effective **incentives** are in place for their development, acquisition, deployment and diffusion



“Today, the time for doubt has passed. The IPCC has unequivocally affirmed the warming of our climate system, and linked it directly to human activity”

Mr Ban Ki-moon
Secretary General, United Nations

“Now is the time to confront this challenge once and for all. Delay is no longer an option. Denial is no longer an acceptable response.”

“Climate change is real. It is something we have to deal with now, not 10 years from now, not 20 years from now.”

- **Barrack Obama**