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CLIMATE CHANGE AND ITS TECHNOLOGICAL IMPLICATIONS

Abstract: The paper highlights the structural strengths of the Intergovernmental Panel on Climate Change (IPCC) and the manner in which it functions to create a link between scientific assessment and policy making. Results and findings are presented from the Fifth Assessment Report (AR 5) of the IPCC to highlight the current knowledge on climate change and projections for the future. Technology is shown to be a major driver of changes that are currently taking place, and the potential of future technologies highlighted in the context of solutions that would need to be implemented for reducing the risks from the future impacts of climate change. A transformation is advocated for the development and use of science and technology, so that the survival of species and health of natural ecosystems can be ensured on the basis of knowledge which already exists in the AR 5 of the IPCC.

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Science, robust knowledge and government policy

Sitting at the interface between science and politics, the IPCC assessment process has sustained a working dialog between the world's governments and scientists since its inception in 1988. Representatives of 194 participating governments agree on the scope of the assessment, elect the scientific leaders of the assessment, nominate authors, review the results, and approve the summaries written for policymakers.

Communicating the results of IPCC assessments is challenging because of the range and complexity of climate science and response options and the increasing need to speak to audiences beyond scientists and governments.

The IPCC is unique in the way it combines an intergovernmental form with scientific objectives. Representatives of participating governments (the Panel), in consultation with members of the Bureau, determine the scope of the assessment and review and accept the reports, and thousands of scientists from all over the world devote their professional expertise to carry out the assessment. This combination of responsibilities has yielded a landmark series of global assessments related to climate change and sustained the interest and support of governments on a critical set of policy-relevant climate issues.

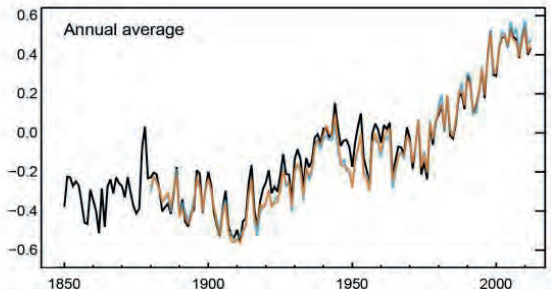
Key Messages

- ➜ **Human influence on the climate system is clear**
- ➜ **The more we disrupt our climate, the more we risk severe, pervasive and irreversible impacts**
- ➜ **We have the means to limit climate change and build a more prosperous, sustainable future**

AR5 WGI SPM, AR5 WGII SPM, AR5 WGIII SPM

Humans are changing the climate

It is extremely likely that we are the dominant cause of warming since the mid-20th century

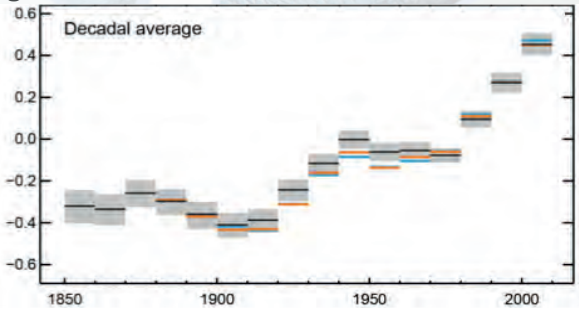


Globally averaged combined land and ocean surface temperatures

AR5 WGI SPM

Temperatures continue to rise

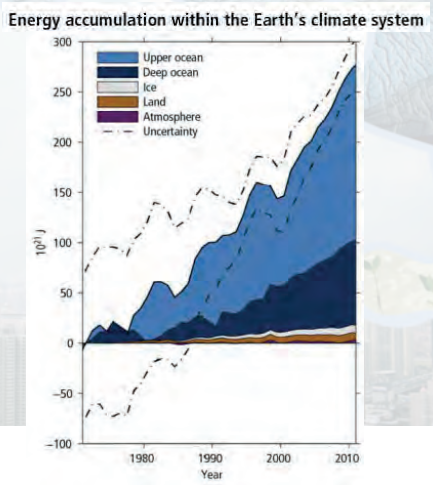
Each of the past 3 decades has been successively warmer than the preceding decades since 1850



Globally averaged combined land and ocean surface temperatures

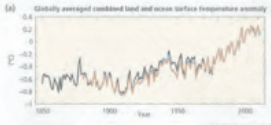
AR5 WGI SPM

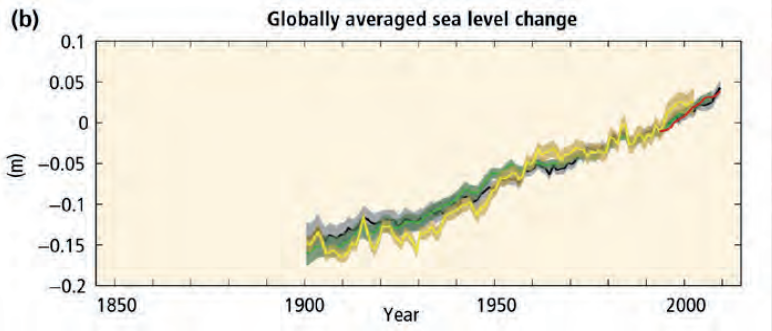
Oceans absorb most of the heat



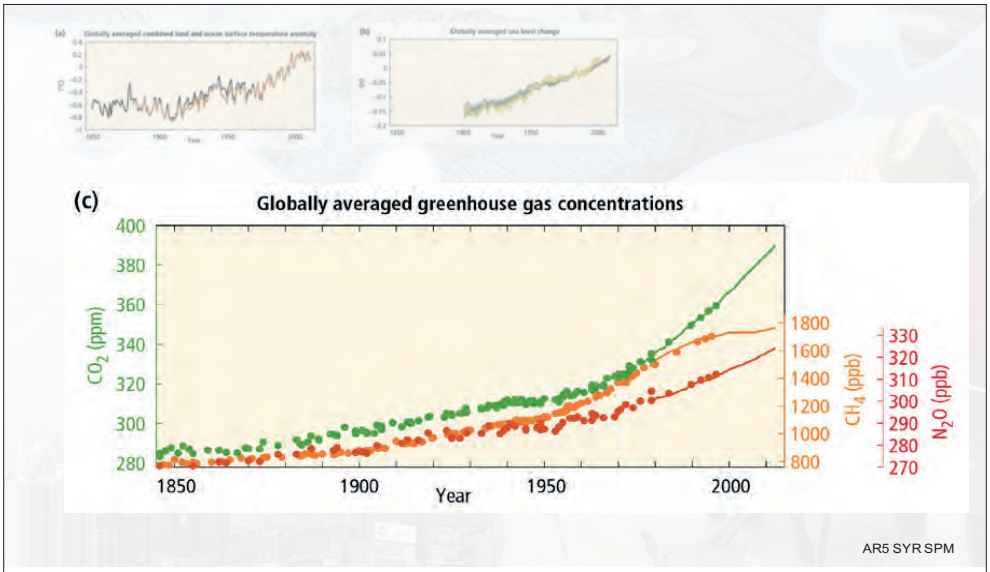
- More than 90% of the energy accumulating in the climate system between 1971 and 2010 has accumulated in the ocean
- Land temperatures remain at historic highs while ocean temperatures continue to climb

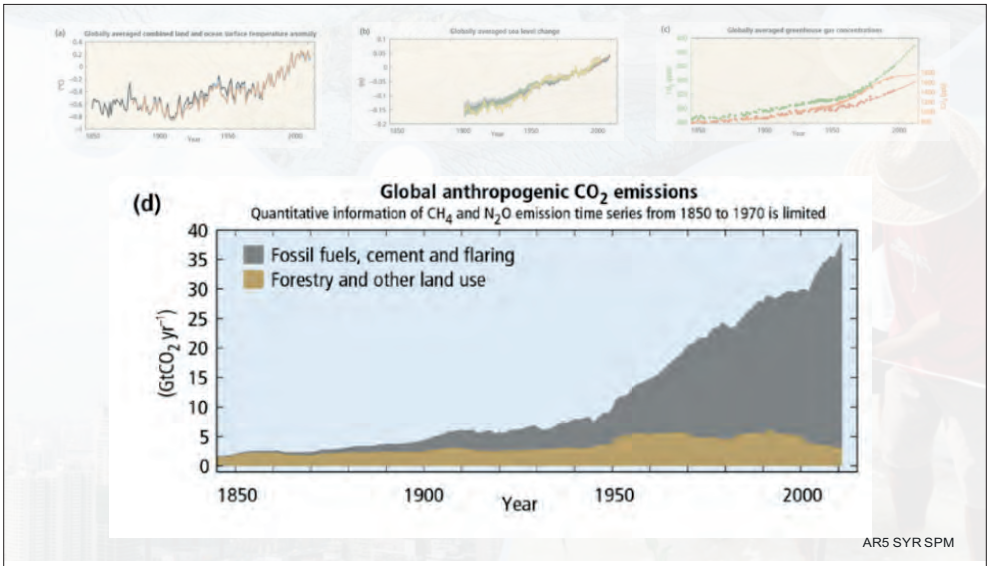
AR5 SYR

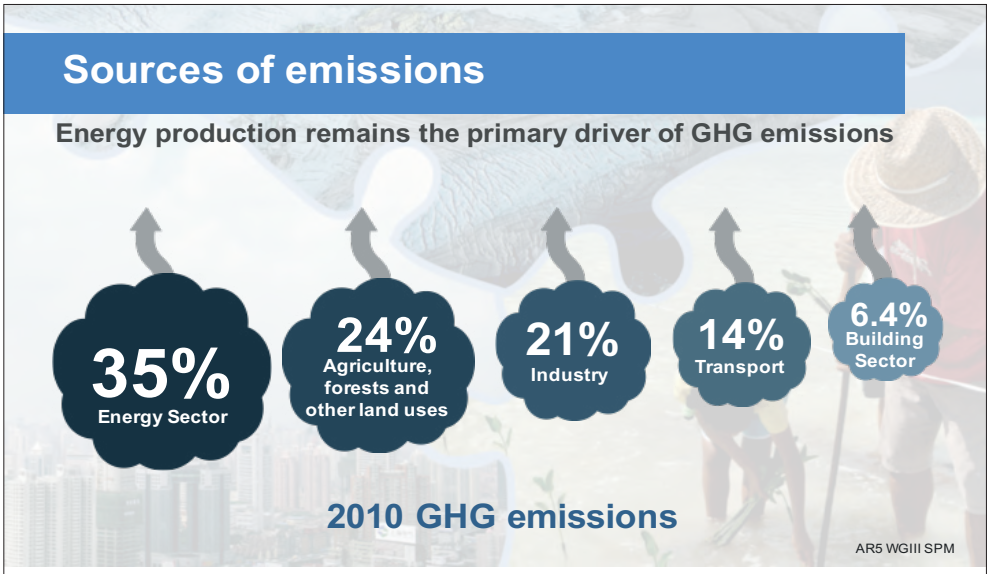




AR5 SYR SPM


(c)
Globally averaged greenhouse gas concentrations
CO_2 (ppm)
400
380
360
340
320
300
280
1800
1600
1400
1200
1000
800
CH_4 (ppb)
330
320
310
300
290
280
270
N_2O (ppb)
1850
1900
1950
2000
Year
AR5 SYR SPM


(d)
Global anthropogenic CO_2 emissions
Quantitative information of CH_4 and N_2O emission time series from 1850 to 1970 is limited
Fossil fuels, cement and flaring
Forestry and other land use
($GtCO_2$ yr^{-1})
40
35
30
25
20
15
10
5
0
1850
1900
1950
2000
Year
AR5 SYR SPM


Sources of emissions
Energy production remains the primary driver of GHG emissions
35%
Energy Sector
24%
Agriculture, forests and other land uses
21%
Industry
14%
Transport
6.4%
Building Sector
2010 GHG emissions
AR5 WGIII SPM


Some of the changes in extreme weather and climate events observed since about 1950 have been linked to human influence
AR5 WGI SPM

Projected climate changes

Continued emissions of greenhouse gases will cause further warming and changes in the climate system

Oceans will continue to warm during the 21st century

Global mean sea level will continue to rise during the 21st century

It is very likely that the Arctic sea ice cover will continue to shrink and thin as global mean surface temperature rises

Global glacier volume will further decrease

AR5 WGI SPM

Potential Impacts of Climate Change

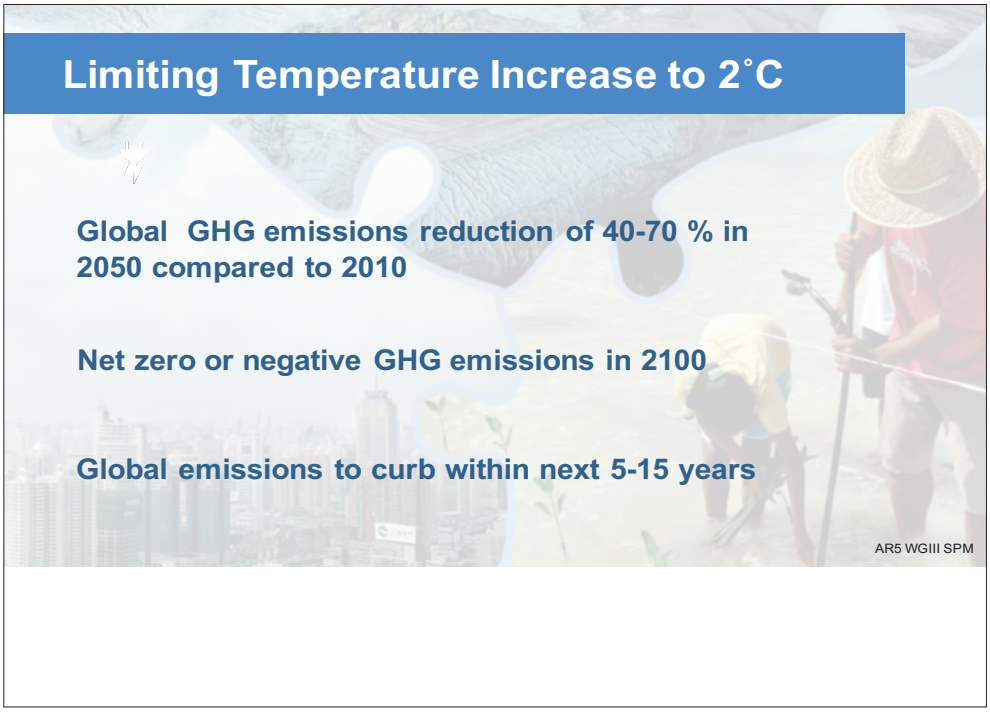
Food and water shortages

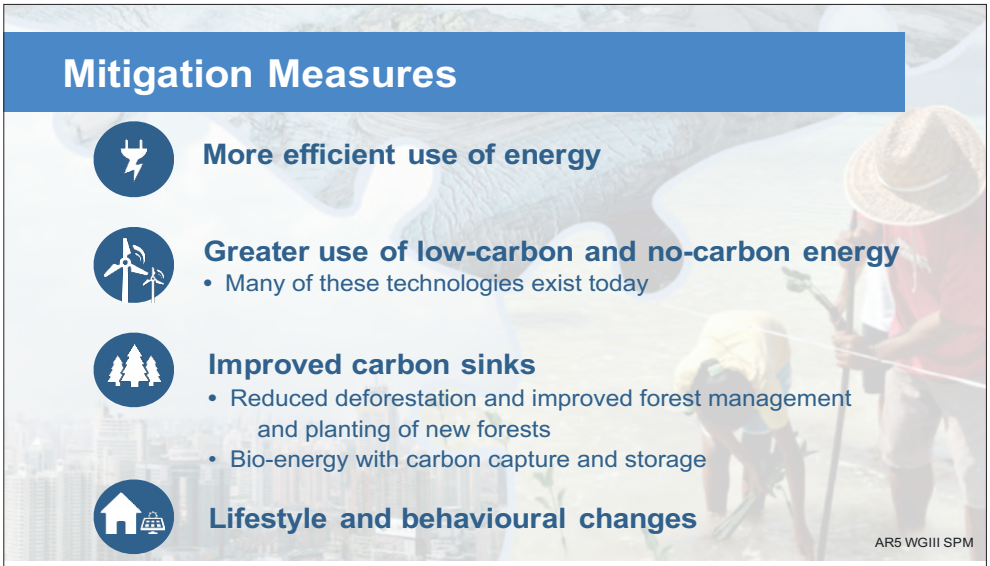
Increased displacement of people

Increased poverty

Coastal flooding

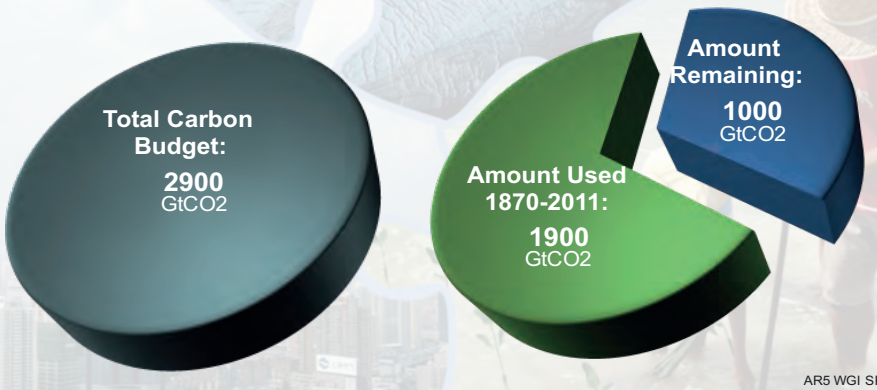
AR5 WGII SPM


Limiting Temperature Increase to 2˚C
Global GHG emissions reduction of 40-70 % in 2050 compared to 2010
Net zero or negative GHG emissions in 2100
Global emissions to curb within next 5-15 years
AR5 WGIII SPM


Mitigation Measures
More efficient use of energy
Greater use of low-carbon and no-carbon energy
• Many of these technologies exist today
Improved carbon sinks
• Reduced deforestation and improved forest management and planting of new forests
• Bio-energy with carbon capture and storage
Lifestyle and behavioural changes
AR5 WGIII SPM

The window for action is rapidly closing

65% of our carbon budget compatible with a 2° C goal already used



AR5 WGI SPM

What will Paris achieve?

- Will exceed the 2°C target
- Does not involve binding commitments
- No provision for penalising failure
- Ignores the message of urgency in IPCC's AR5
- Upgradation of INDCs only in 2018 and then again in 2023

All stakeholders on board

- Essential for governments, businesses and research organisations to evaluate compliance with 2°C limit
- Greatest assurance of 2°C limit lies in RCP 2.6 scenario
- Hence, essential for global society to constantly evaluate commitments against RCP 2.6 as a pathway
- INDCs dependent on level of ambition in different societies
- Hence, crucially important to raise the level of ambition worldwide

What is the POP Movement?

- Addresses the Urgent Need to Share Information and Knowledge Among Youth About Solutions to:
  - ➜ Achieve Sustainable Development Goals
  - ➜ Mitigate Climate Change
  - ➜ Adapt to the Impacts of Climate Change

POP PROTECT OUR PLANET

Why the POP Movement?

- Current Lack of Knowledge, Awareness and Inertia to Implement Climate Change Solutions are a Major Gap in Action
- The POP Movement Will Create and Serve the Massive Demand for Action That Can Be Implemented in Schools, Colleges and Communities Worldwide
- Knowledge About Climate Change Solutions Will Be Provided as Part of the POP Movement

POP PROTECT OUR PLANET

What Does POP Do?

- **The POP Movement:**

❖Mobilizes Young People Globally to Protect Our Planet

❖Promotes Collective Action, Especially Among Youth to Implement Solutions Needed to Mitigate Climate Change

❖Recognizes and Reward Youth-Led Actions, Exemplary Initiatives, and Success Stories

POP PROTECT OUR PLANET

POP Festival in New York, 2016

POP Will Host a Festival in New York

- ➜ Showcase Youth Action to Protect Our Planet
- ➜ Launch US Partnerships
- ➜ Support Networking and Cross-Learning

"A technological society has two choices.

First it can wait until catastrophic failures expose systemic deficiencies, distortion and self deceptions…

Secondly, a culture can provide social checks and balances to correct for systemic distortion prior to catastrophic failures"

- Mahatma Gandhi