



# IPCC Fifth Assessment Report Synthesis Report

**Dr. Leo Meyer**

Bogazici University, 10 September 2015

IPCC Outreach event Istanbul, Turkey

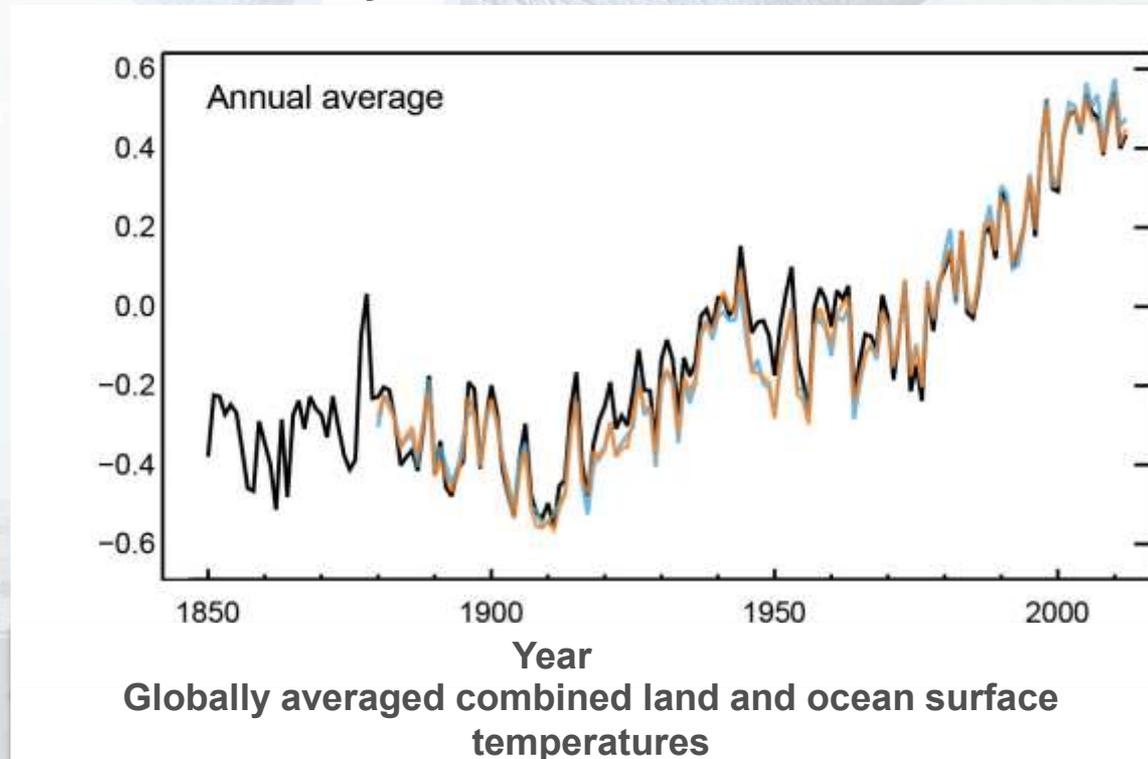
# Key Messages

- **Human influence on the climate system is clear; impacts are already there**
- **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

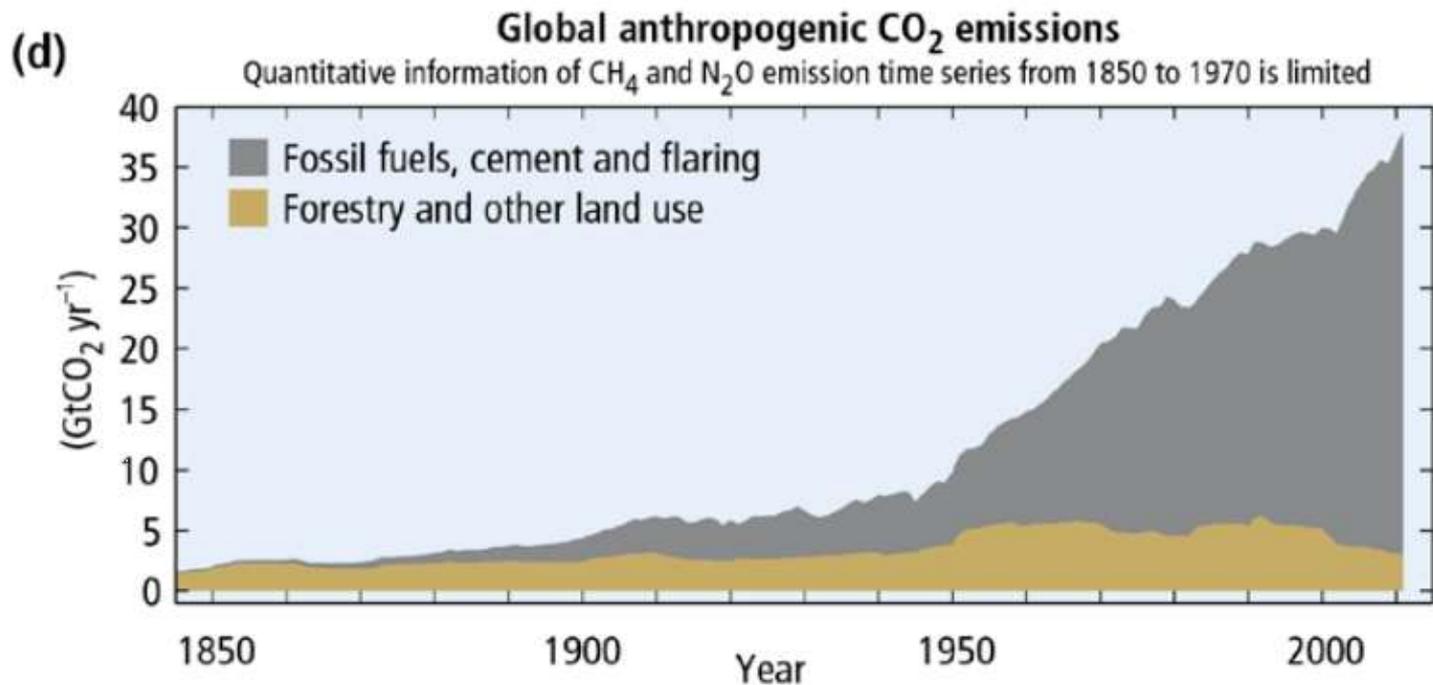
# Humans are changing the climate

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



AR5 WGI SPM

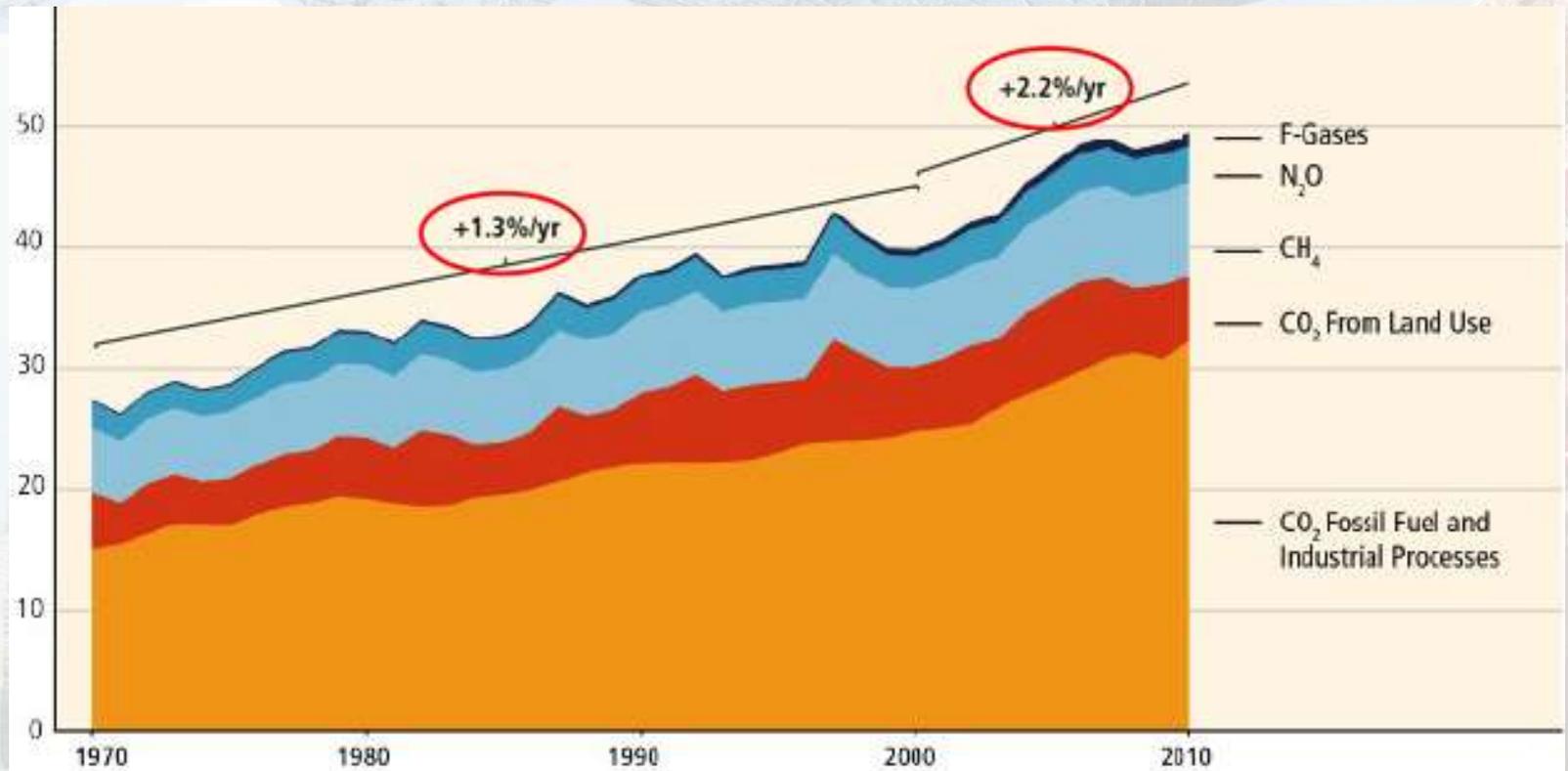
# CO<sub>2</sub> is the main driver of global warming



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# GHG emissions growth between 2000 and 2010 has been larger than in the previous three decades

GHG Emissions [GtCO<sub>2</sub> eq/yr]



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# Impacts are already underway

- **Tropics to the poles**
- **On all continents and in the ocean**
- **Affecting rich and poor countries**



AR5 WGII SPM

# Observations of climate change in Mediterranean Basin



- Wildfires significantly increased after the 1970s
- Including in France, Greece, Italy, Portugal, Spain, and Turkey

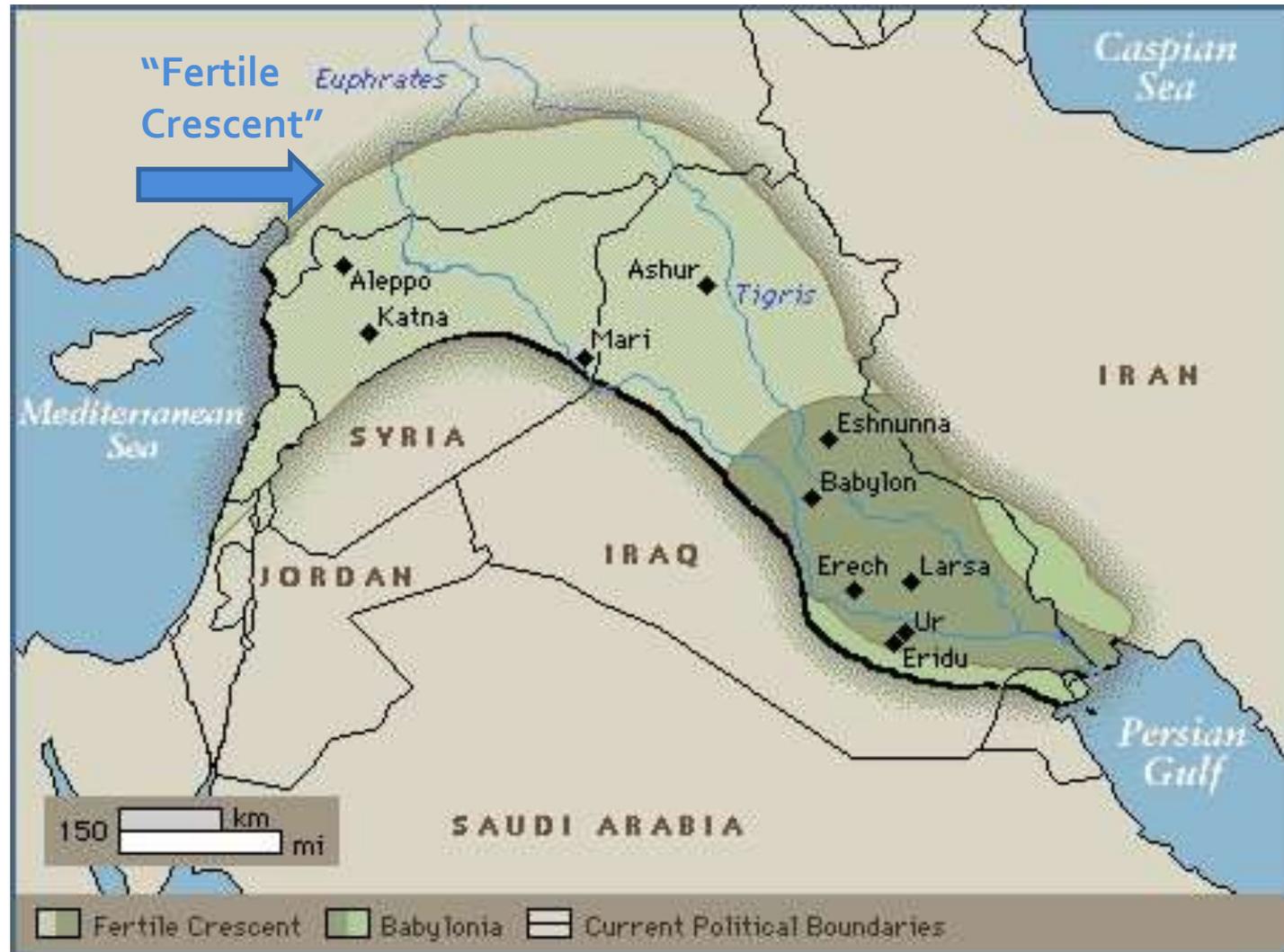


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INTERGOVERNMENTAL PANEL ON climate change



“There is evidence that human influences on the climate system are implicated in the current Syrian conflict “ (PNAS March 2015)



# Projections

**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

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# Sea level rise



Ortakoy mosque, Istanbul

A 1 m sea level rise in Turkey could affect 3 million additional people and put US\$12 billion capital value at risk, with around US\$20 billion adaptation costs

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# Projected Impacts of Climate Change



Food and water shortages



Increased displacement of people



Increased poverty



Coastal flooding

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# Water shortages



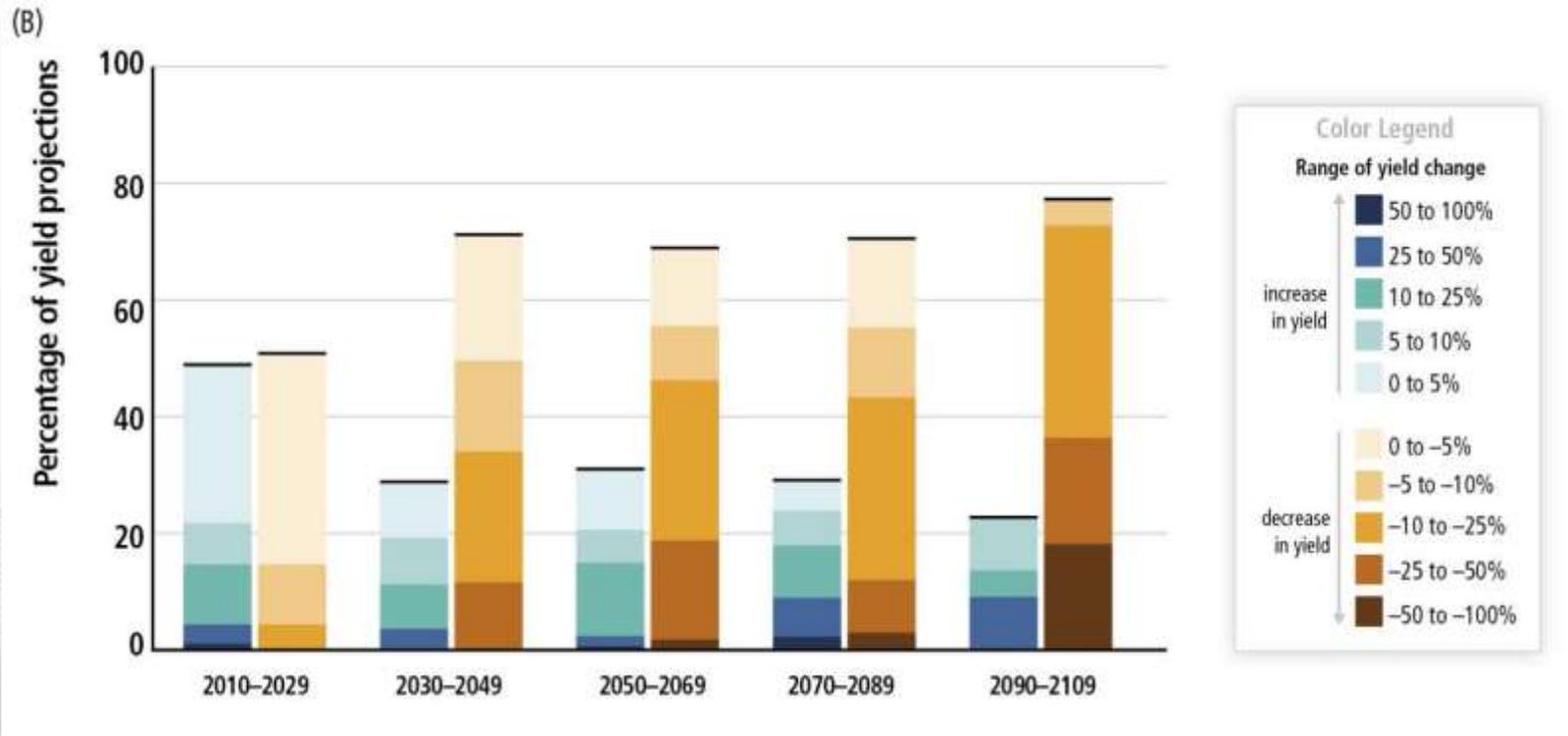
The Mediterranean region will suffer agricultural and forests production losses due to increasing heat waves and droughts exacerbated also by the competition for water

Turkey plans to more than double water abstraction by 2023



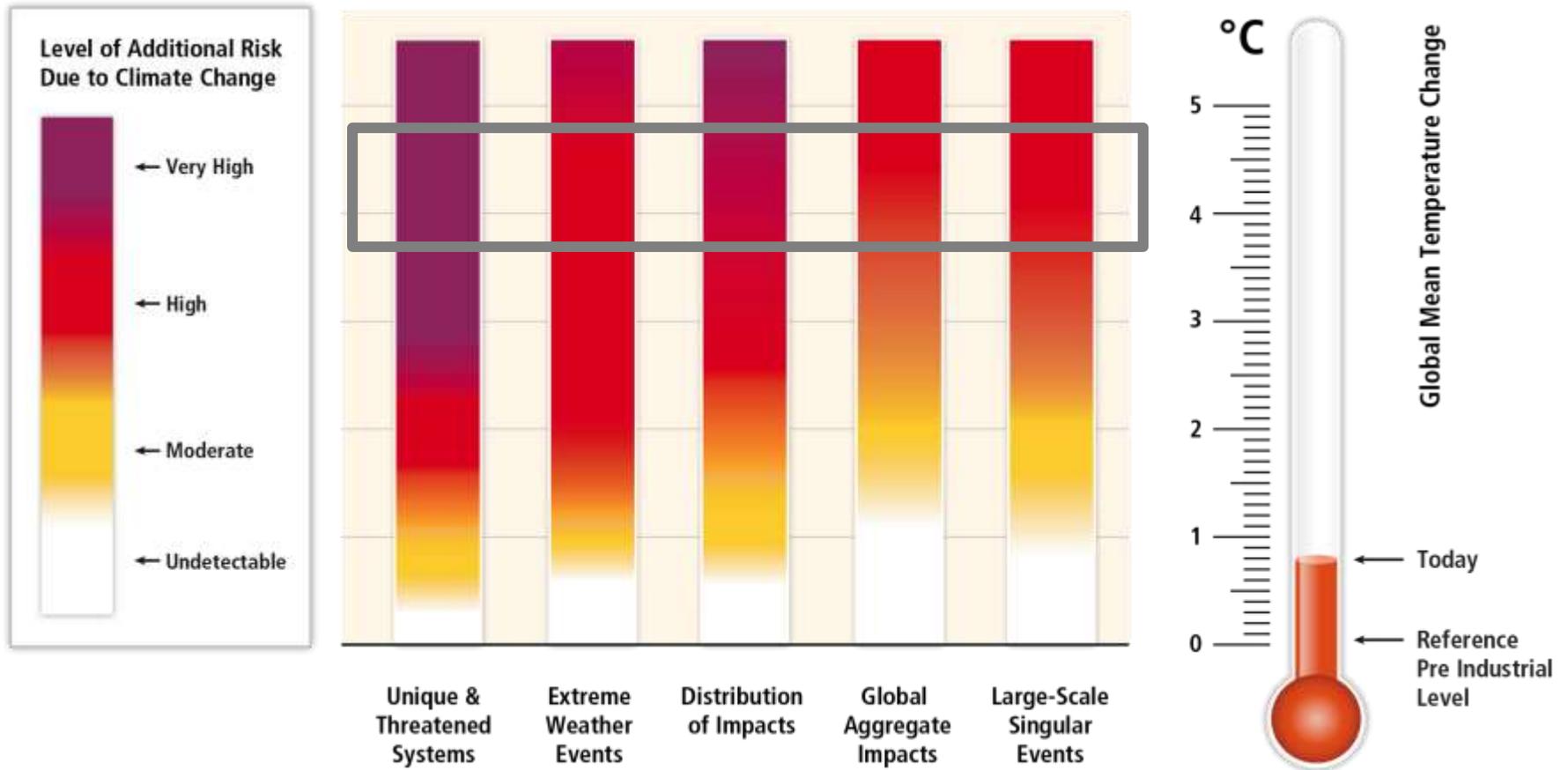
# Climate Change Poses Risk for Food Production

Percentage of yield projections



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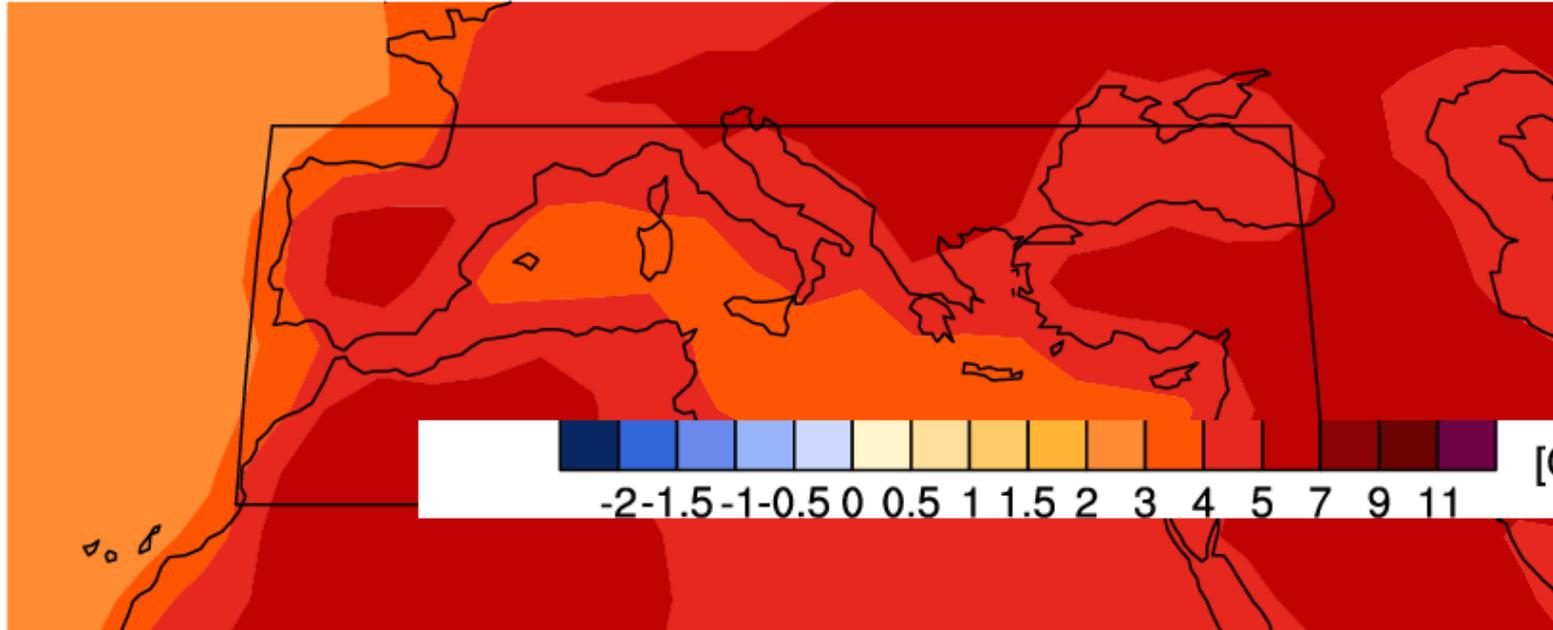
# Without additional mitigation, global mean surface temperature is projected to increase by 3.7 to 4.8 °C over the 21<sup>st</sup> century...



Based on WGII AR5 Figure 19.4

... and in Turkey inland to 7 °C .

mean rcp85 Tmax 2081-2100 minus 1986-2005 Jan-Dec AR5 CMIP5 subset



# 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**

**Ambitious mitigation is affordable**

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# Bio-Energy

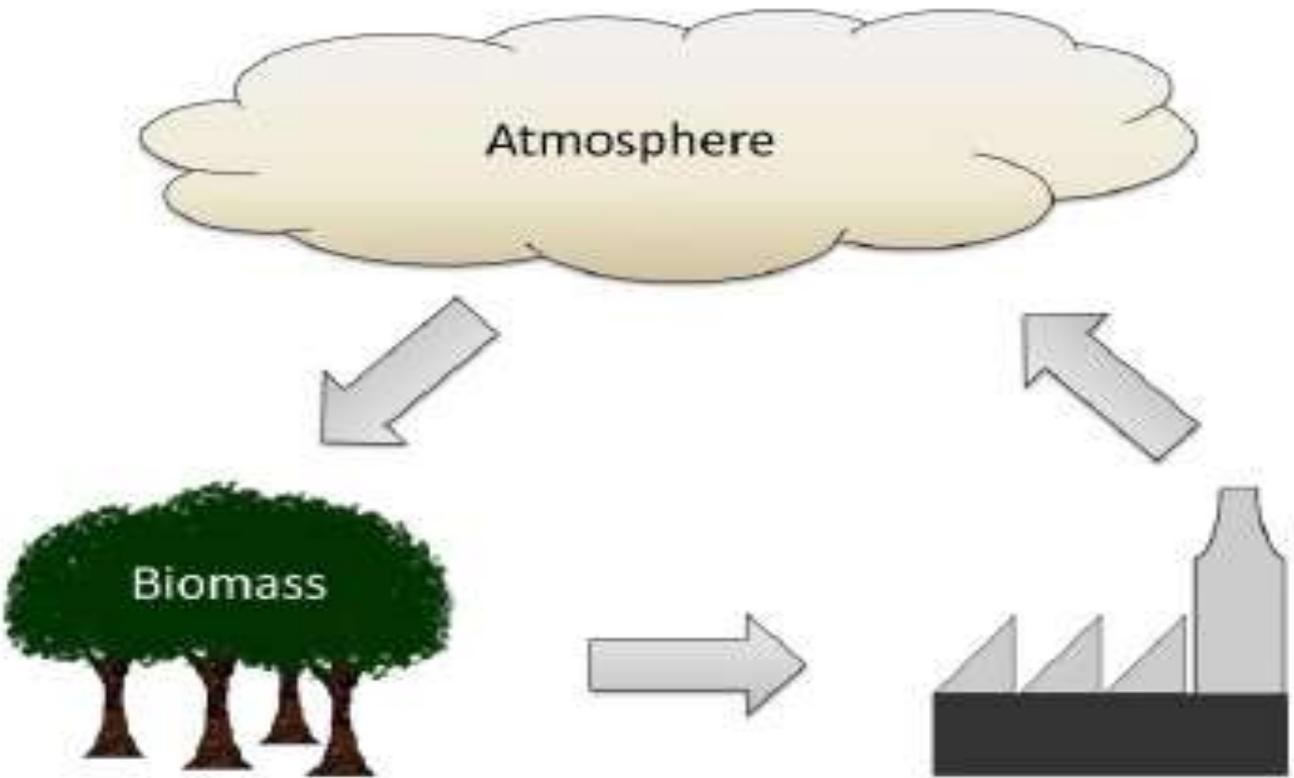


Figure 3 Bio-energy carbon flow

# Bio-Energy with Carbon Capture and Storage

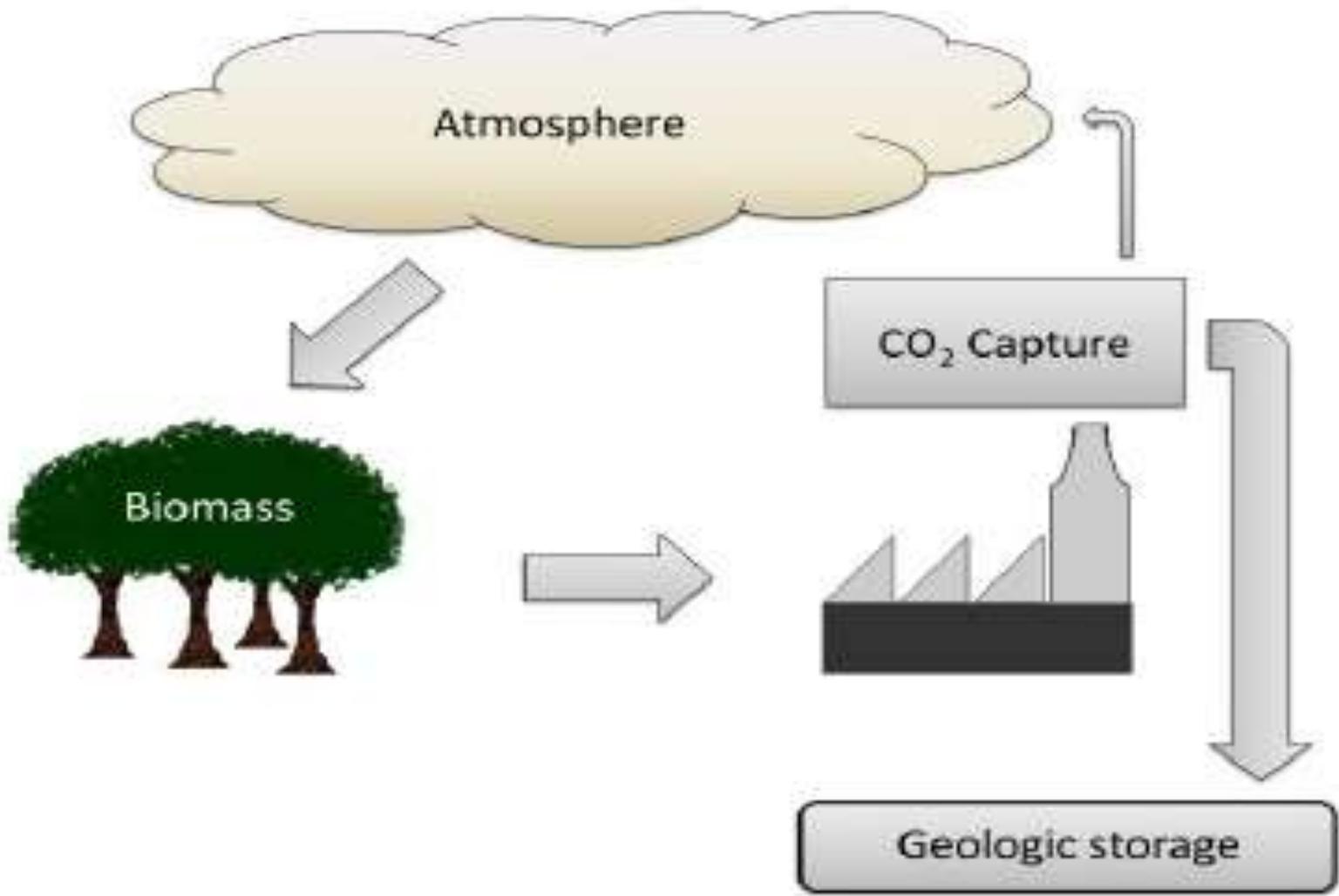


Figure 4 Bio-Energy with CCS (BECCS) carbon flow

# Bio-Energy with Carbon Capture and Storage

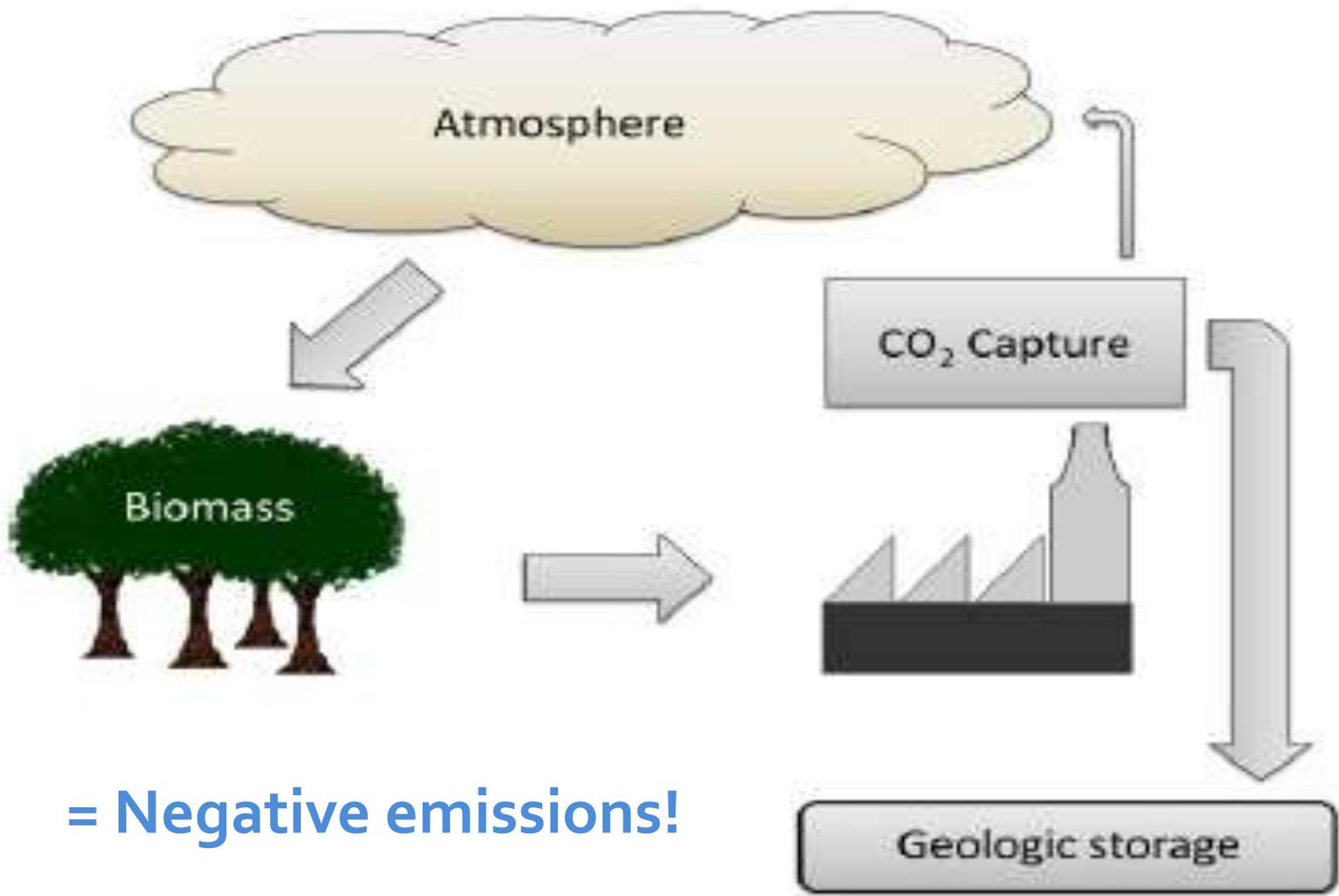
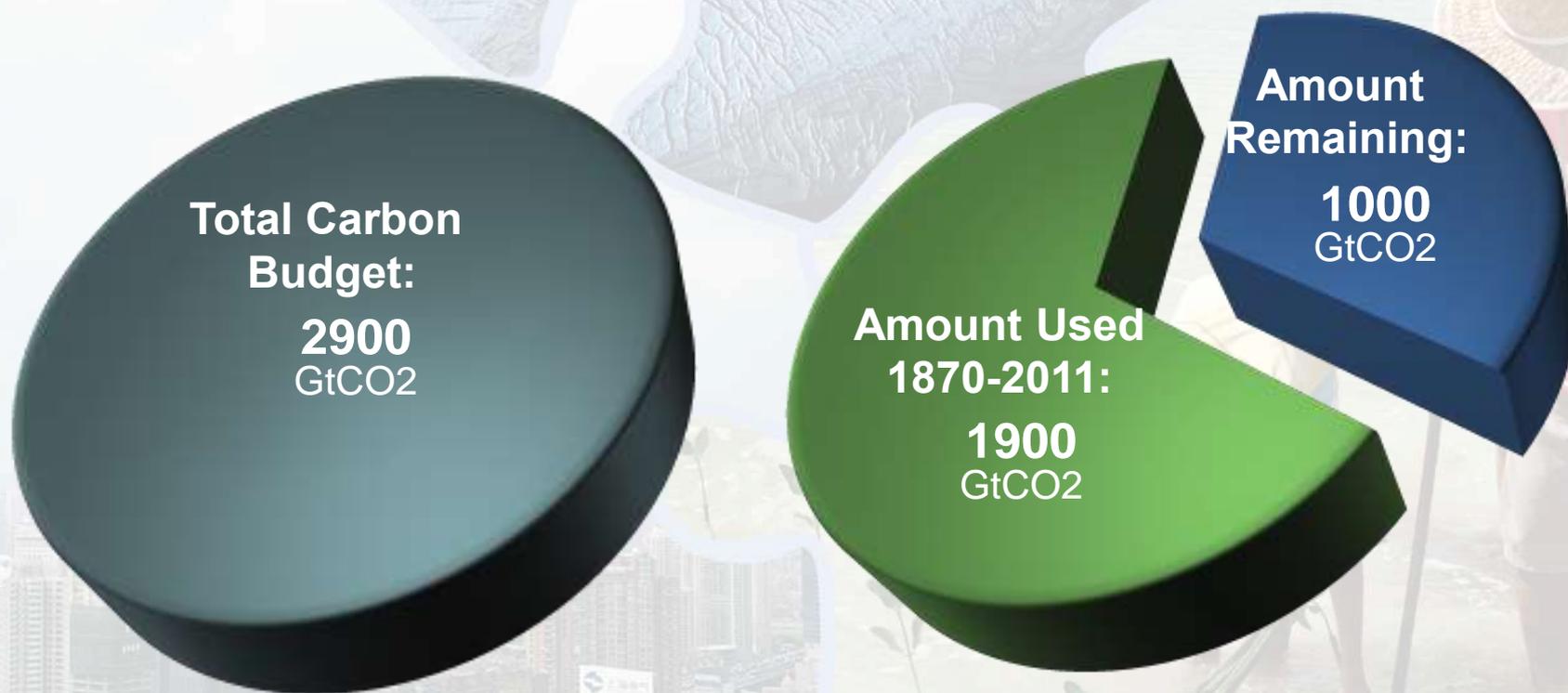


Figure 4 Bio-Energy with CCS (BECCS) carbon flow

# The window for action is rapidly closing

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

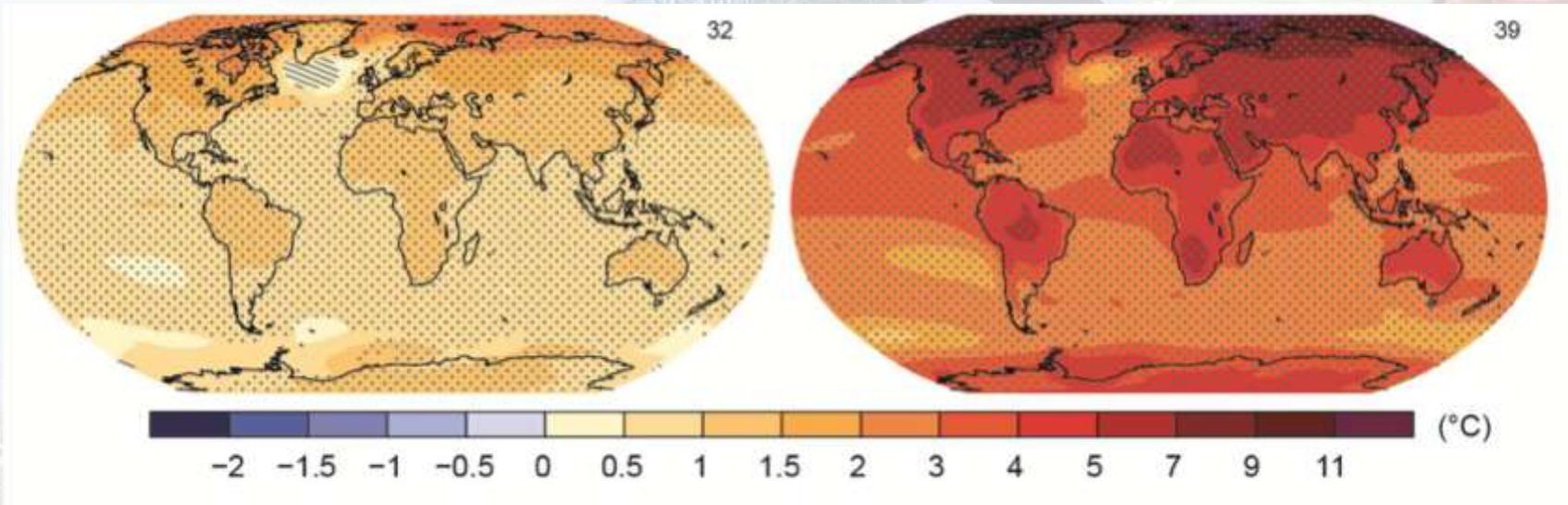


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# The Choices We Make Will Create Different Outcomes

With substantial mitigation

Without additional mitigation



Change in average surface temperature (1986–2005 to 2081–2100)

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