

Gauhati, Assam, India

July 16, 2013

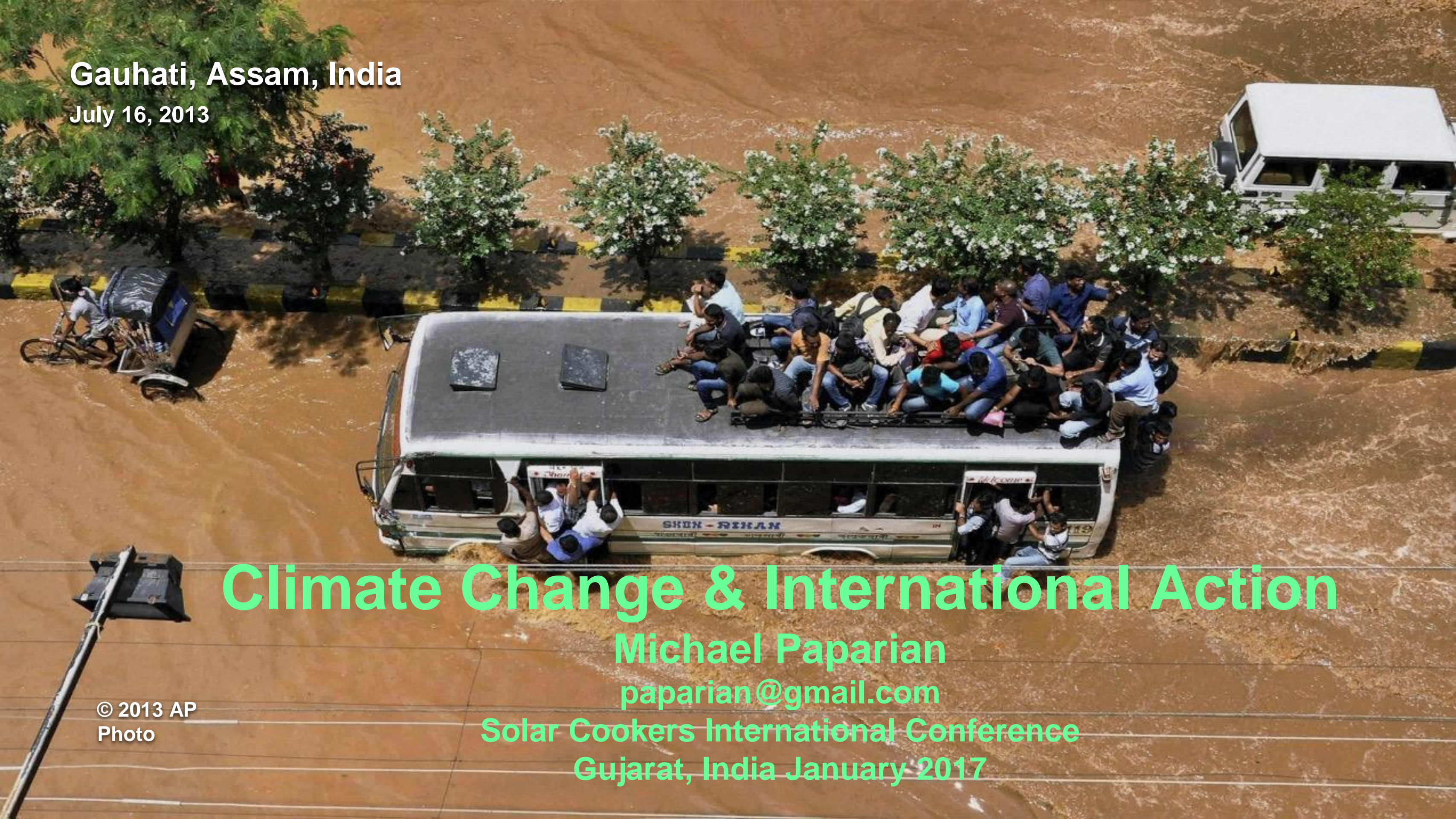
Climate Change & International Action

Michael Paparian

paparian@gmail.com

Solar Cookers International Conference
Gujarat, India January 2017

© 2013 AP
Photo



Where Do Greenhouse Gases Come From?



THAWING PERMAFROST

AIR TRANSPORT

COAL MINING

COAL PLANTS

OIL PRODUCTION

INDUSTRIAL PROCESSES

CROP BURNING

FERTILIZATION

FOREST BURNING

INDUSTRIAL AGRICULTURE

LAND TRANSPORTATION

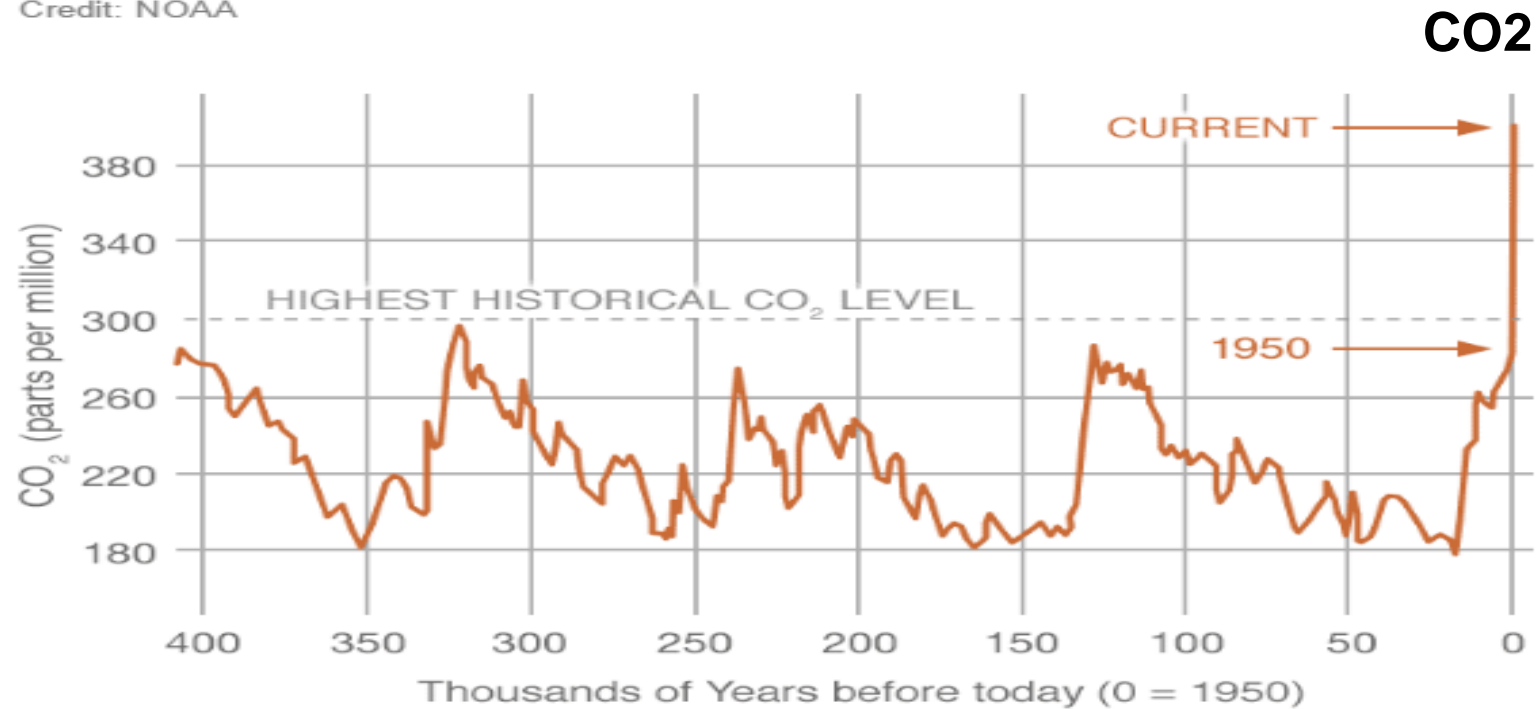
LANDFILLS

NASA Provided Data

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solarcookers.org

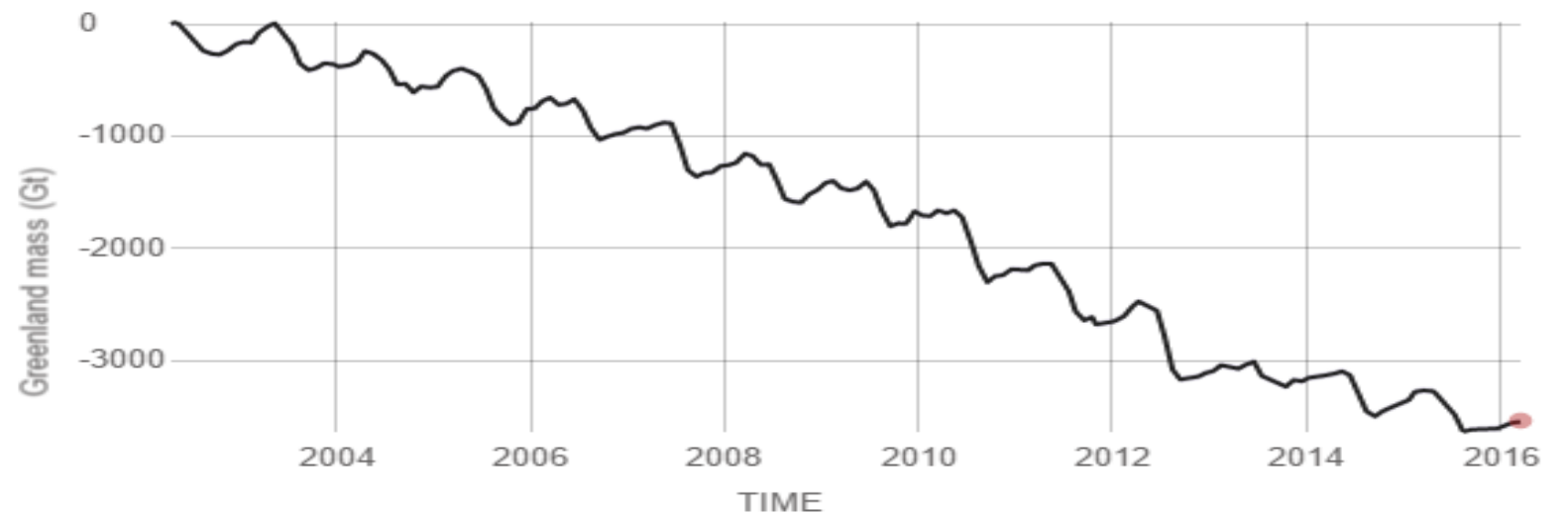
As CO₂ & GHG Rise, Temperatures Increase, Ice Melts, Sea Level Rises

Data source: Reconstruction from ice cores.
Credit: NOAA



GREENLAND MASS VARIATION SINCE 2002

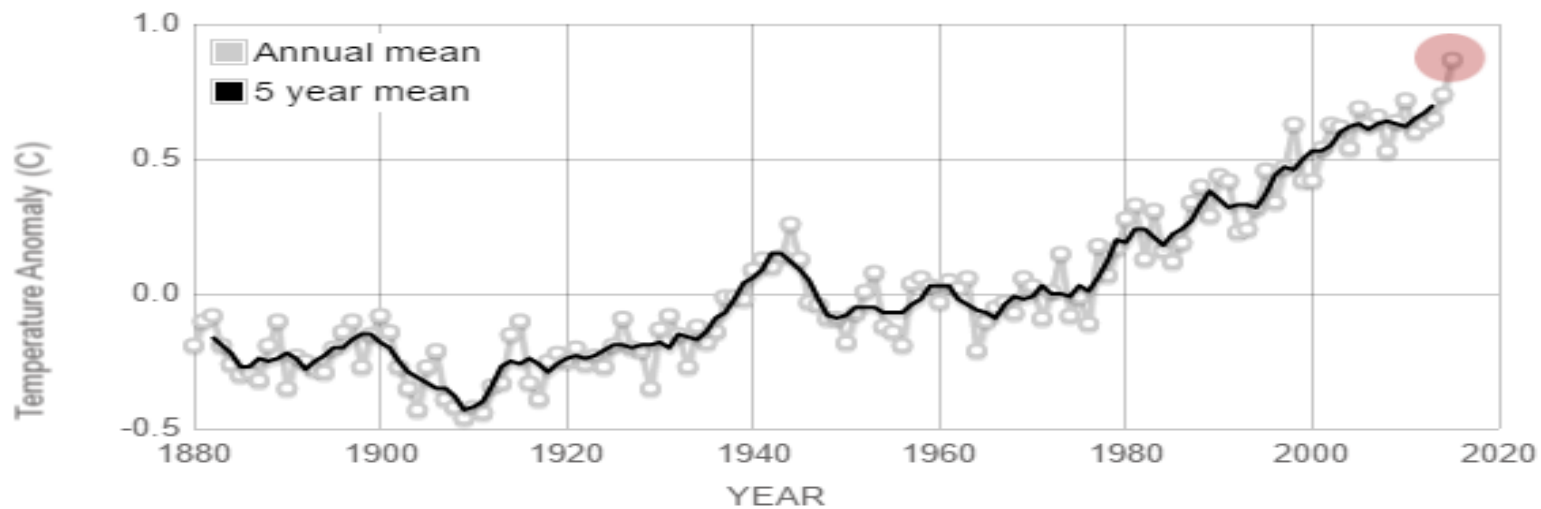
Data source: Ice mass measurement by NASA's GRACE satellites.
Credit: NASA



RATE OF CHANGE
↓ **281.0**
Gigatonnes per year
margin: ±29

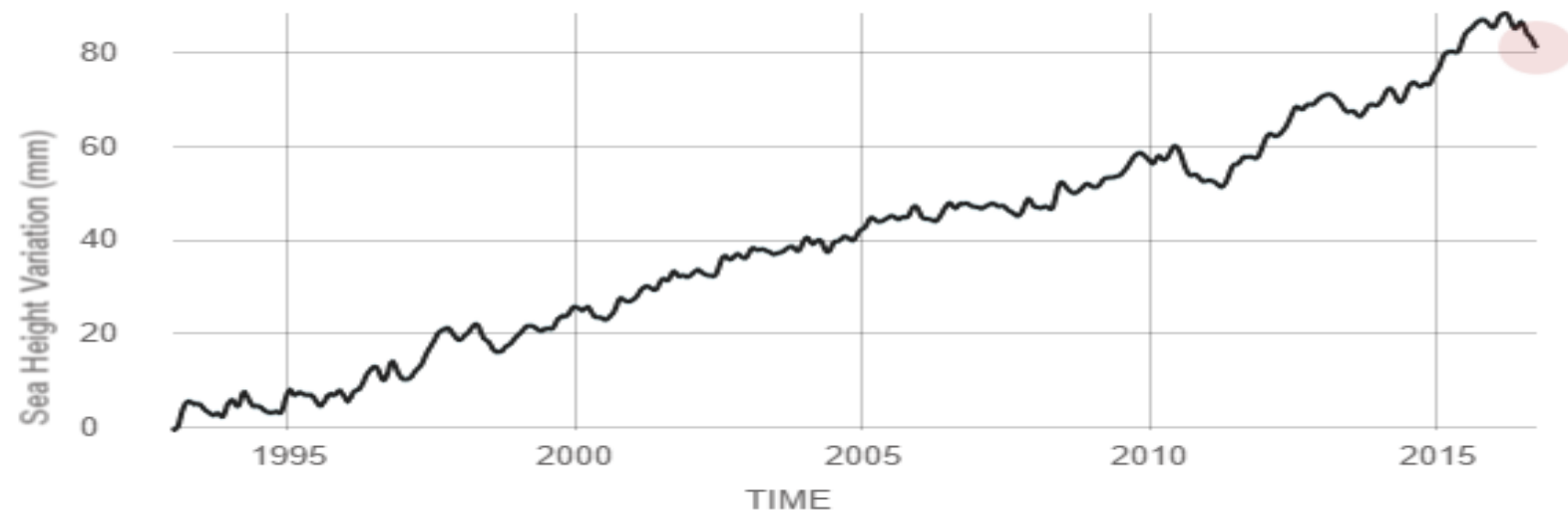
GLOBAL LAND-OCEAN TEMPERATURE INDEX

Data source: NASA's Goddard Institute for Space Studies (GISS).
Credit: NASA/GISS



SATELLITE DATA: 1993-PRESENT

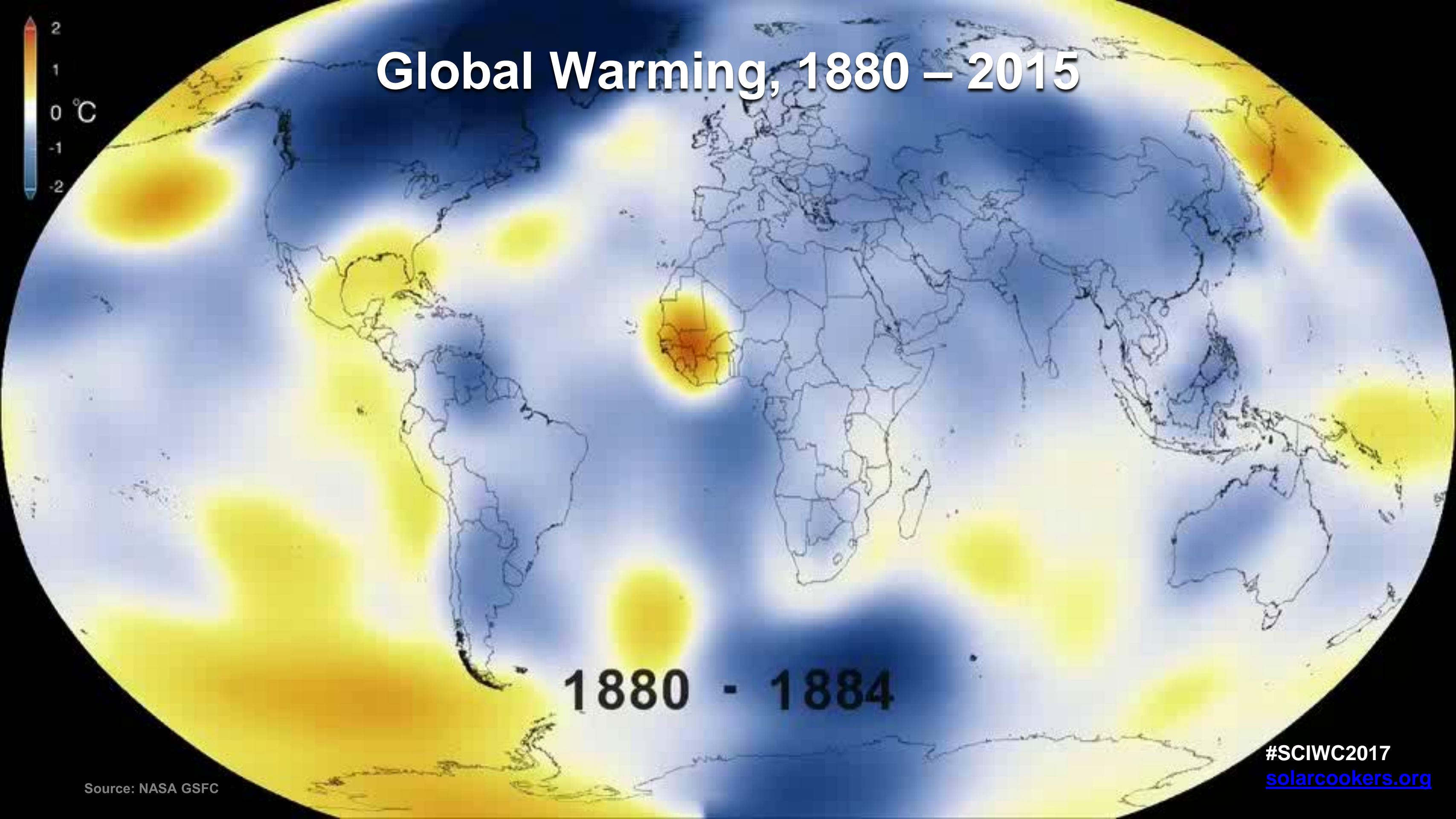
Data source: Satellite sea level observations.
Credit: NASA Goddard Space Flight Center



Sea Level Rise

RATE OF CHANGE
↑ **3.4**
millimeters per year
margin: ±0.4

Global Warming, 1880 – 2015



1880 - 1884

Jammu, India
June 7, 2014



© 2014 AP Photo/Channi Anand

Rishikesh, Uttarakhand State, India
June 18, 2013



© 2013 AP Photo

Ahmedabad, India
May 21, 2015



At least 2,300 people died in the
2015 India heat wave

© 2015 AP Photo/Ajit Solanki

Ahmedabad, India
September 8, 2015



© 2015 Reuters/Amit Dave

The Cost of Carbon

\$ *Political Instability*

\$ *Drought*

\$ *Famine*

\$ *Sea Level Rise*

\$ *Water Scarcity*

\$ *Climate Refugees*

\$ *Storm Damage*

\$ *Floods & Mudslides*

\$ *Infectious Diseases*

\$ *Wildfires*

\$ *Melting Glaciers*

\$ *Dying Coral*

\$ *Ecosystem Loss*

\$ *Species Extinction*

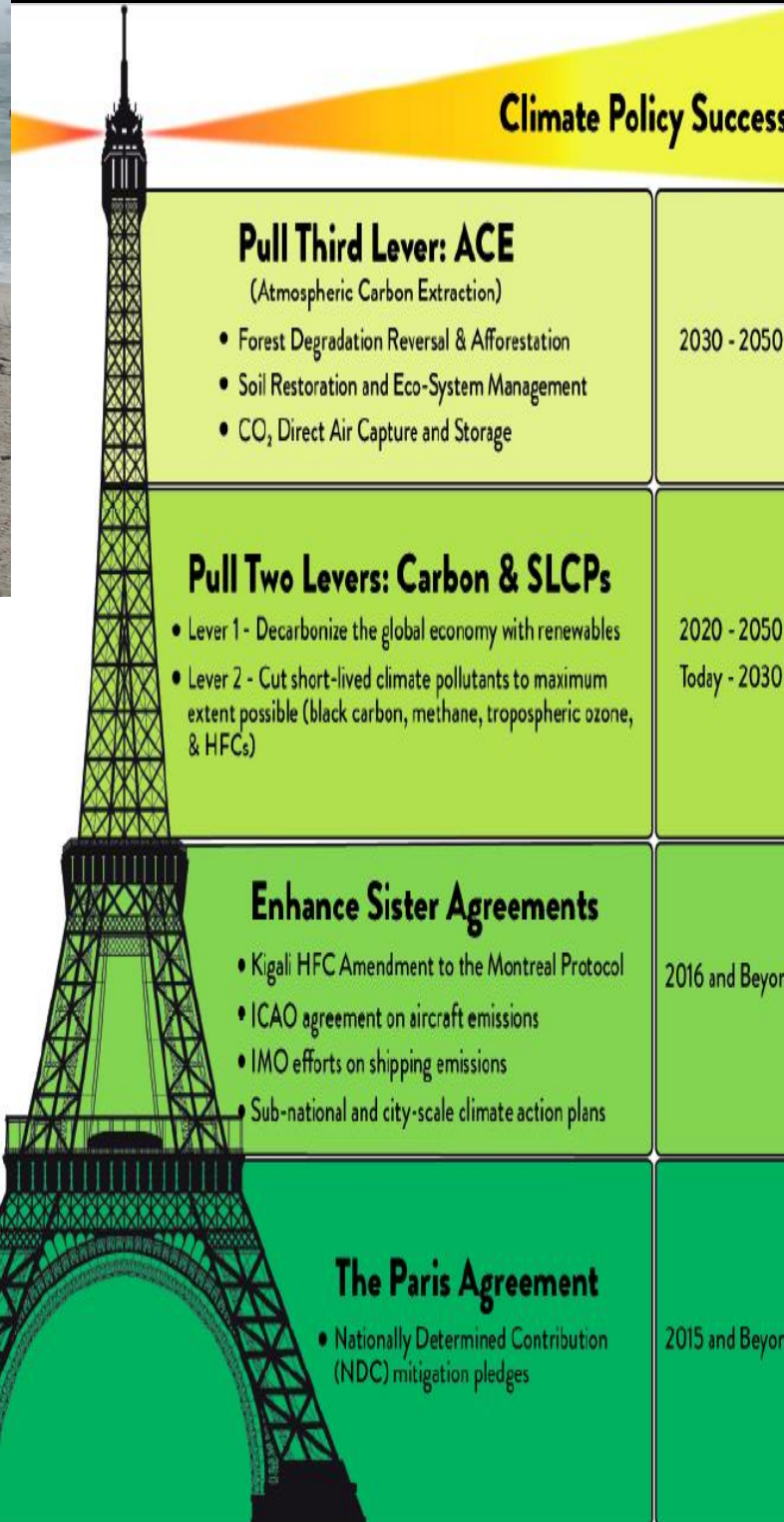
\$ *Infrastructure Loss*

\$ *Our Way of Life*

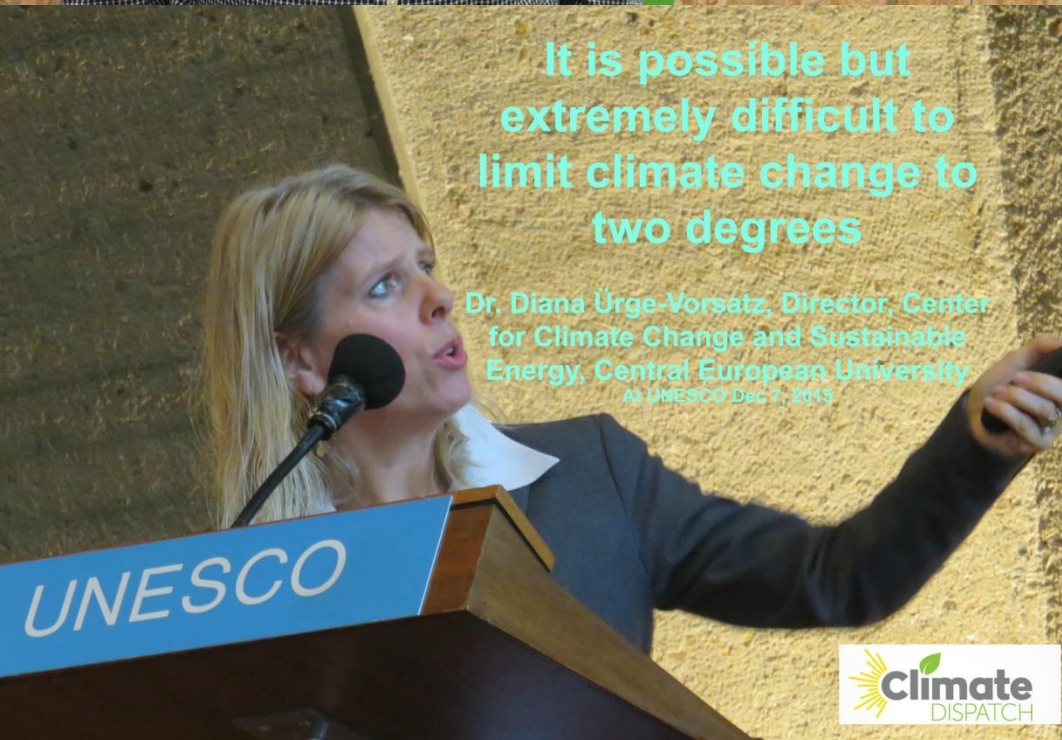


**... And much, much
more**

Options



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Paris COP21

Recognition of Urgency

Country Pledges – INDC/NDC

Future Reviews

Legal Enforcement

Financing & funding for action

Integration with other international schemes: Trade/WTO, aviation, etc.





Marrakech COP22

Implementation – Agreement takes effect earlier than expected

“Momentum is Irreversible”

SubNationals (cities, states) Part of Solution

Mitigation, Adaptation Elaborated

Finance Mechanisms Key

47 Vulnerable Countries Declare 100% Renewable Commitment

More Work: Transparency, Implementation, Enforcement, 2050 Pathways

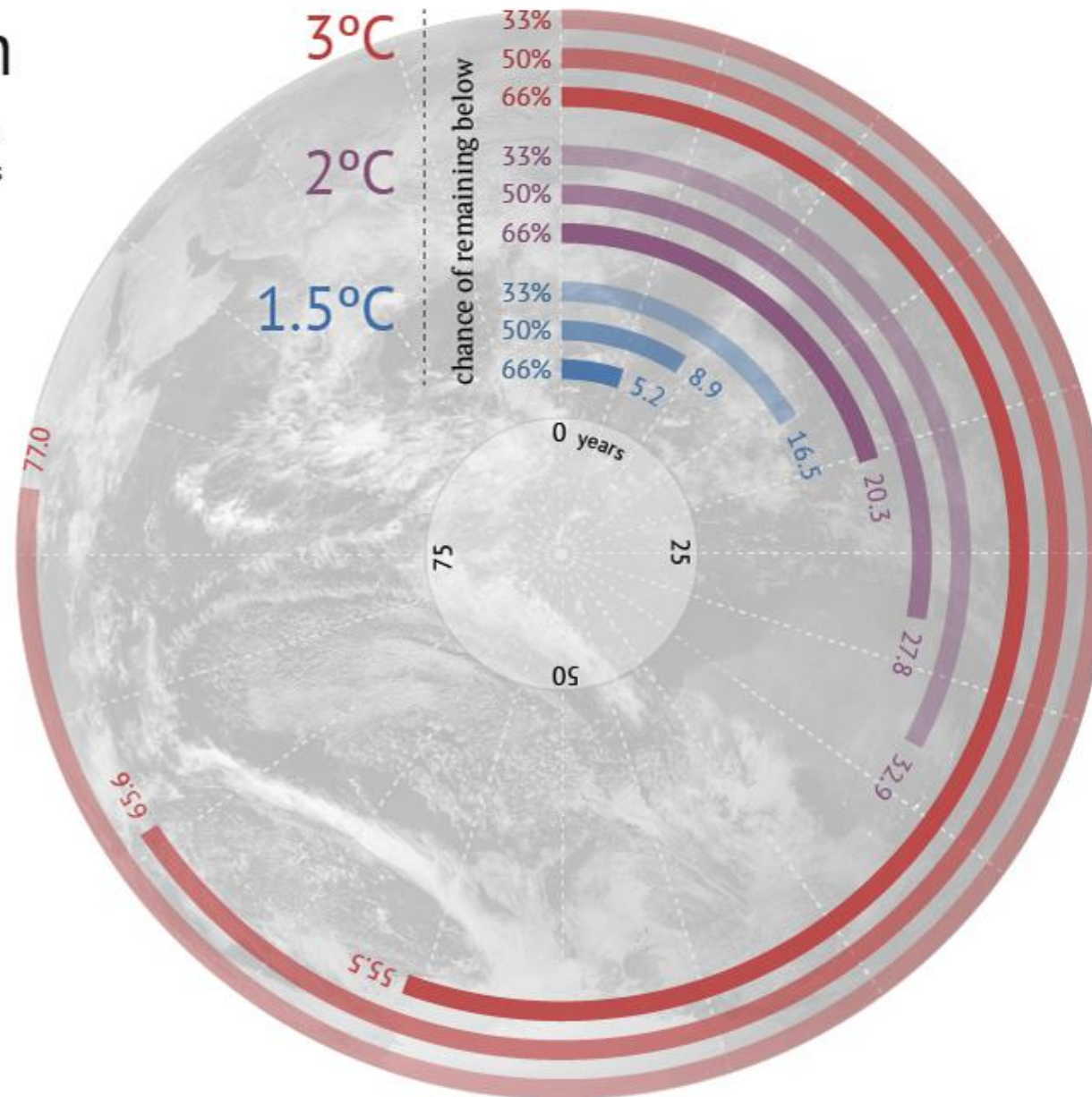


Progress, But Much More Needed



Carbon Countdown

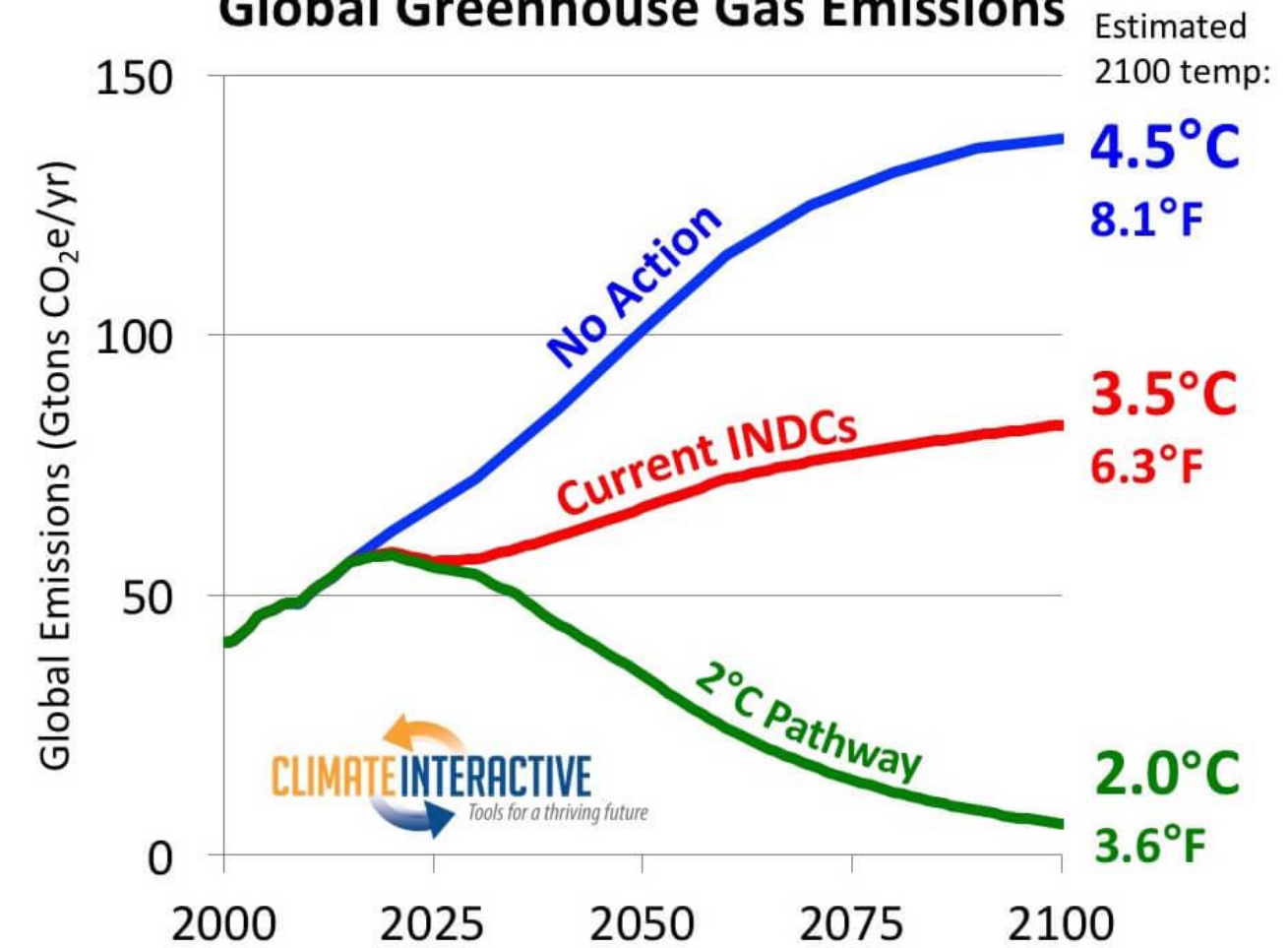
How many years of current emissions would use up the IPCC's carbon budgets for different levels of warming?



CarbonBrief
CLEAR ON CLIMATE

Photo credit: NASA Goddard Space Flight Center
Stopwatch icon: T-Kot/Shutterstock.com

Global Greenhouse Gas Emissions



27 October 2015, www.ClimateScoreboard.org

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SCI
SOLAR COOKERS
INTERNATIONAL

Climate Commitments & Cooking

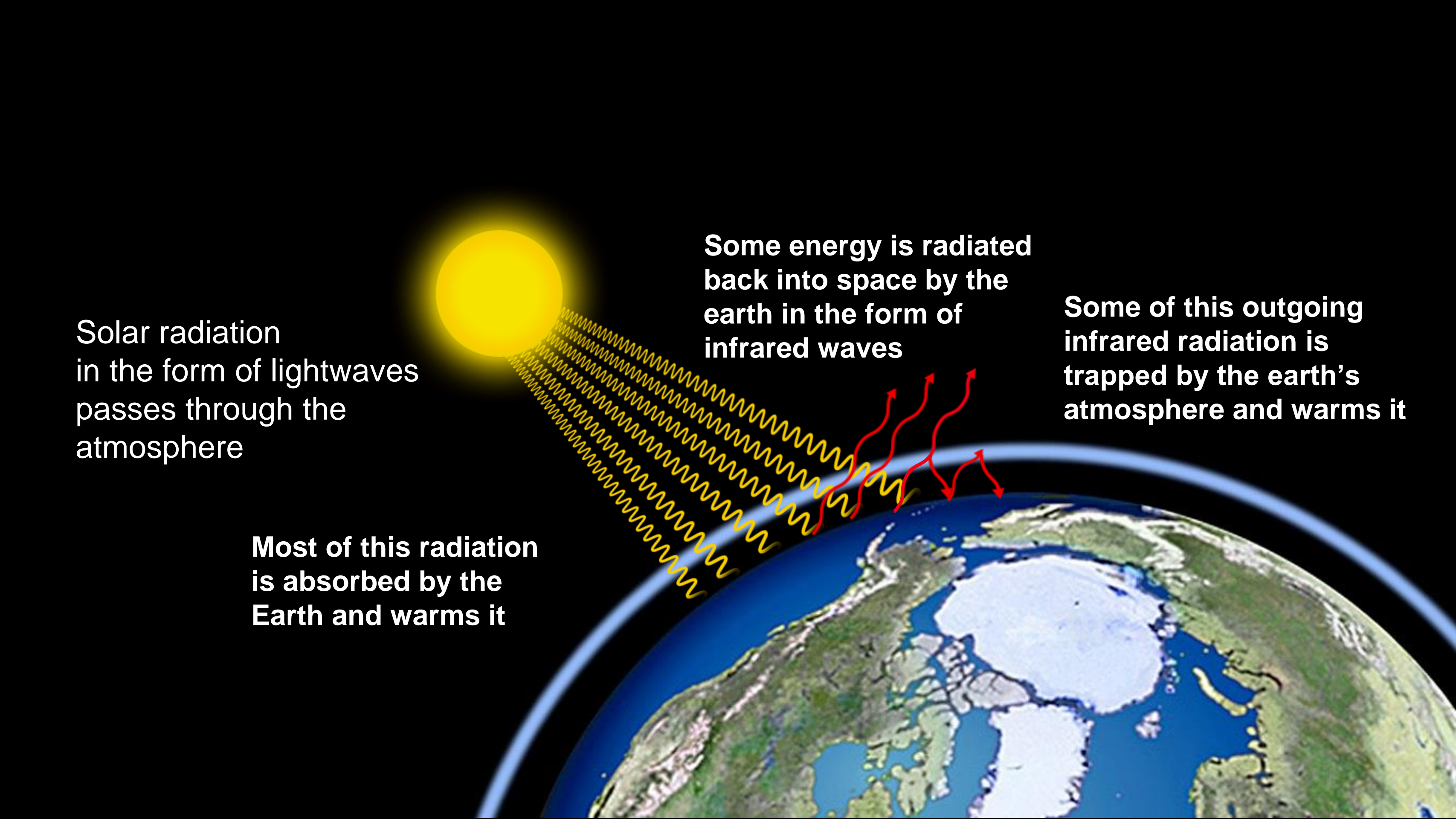
Suchetgarh, India

117 NDCs Submitted to U.N.

- Cooking mentioned: 31
- Cooking goals: 14
- LPG Encouraged: 6
- Solar Cookers mentioned: 3

As of 9 January 2016

Around 3 billion people worldwide cook and heat their homes using open fires or simple stoves burning biomass (wood, animal dung, and crop waste) and coal.



Solar radiation
in the form of lightwaves
passes through the
atmosphere

The diagram illustrates the greenhouse effect. A bright yellow sun in the upper left emits yellow wavy lines representing solar radiation towards the Earth. The Earth is shown as a curved horizon with a blue atmosphere and a landmass featuring a large ice sheet. Yellow wavy lines representing solar radiation are shown entering the atmosphere and hitting the Earth's surface. From the Earth's surface, red wavy lines representing infrared radiation are shown pointing upwards into the atmosphere. Some of these red lines are shown being reflected back down towards the Earth's surface, while others point away from the Earth into space.

**Most of this radiation
is absorbed by the
Earth and warms it**

**Some energy is radiated
back into space by the
earth in the form of
infrared waves**

**Some of this outgoing
infrared radiation is
trapped by the earth's
atmosphere and warms it**