

# Climate Risk — The Science, The Economics, and The Time to Act

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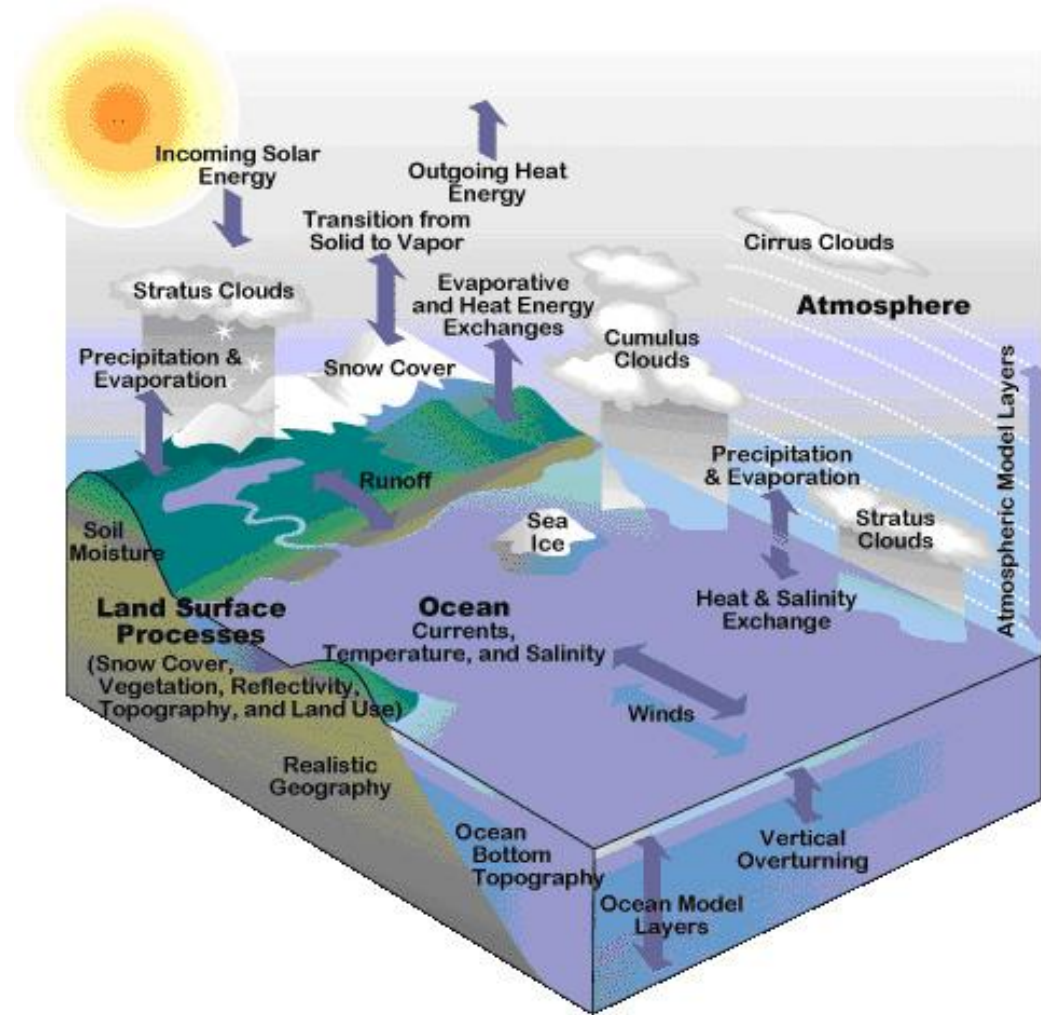
# The Dialogue Today

1. Climate Risk – The Science
2. Climate Risk – The Economics
3. Climate Risk – The Time to Act

1

Climate Risk –  
The Science

# Climate Model Basics



- » Millions
- » Hundreds
- » 30
- » 60

# Climate Model Community



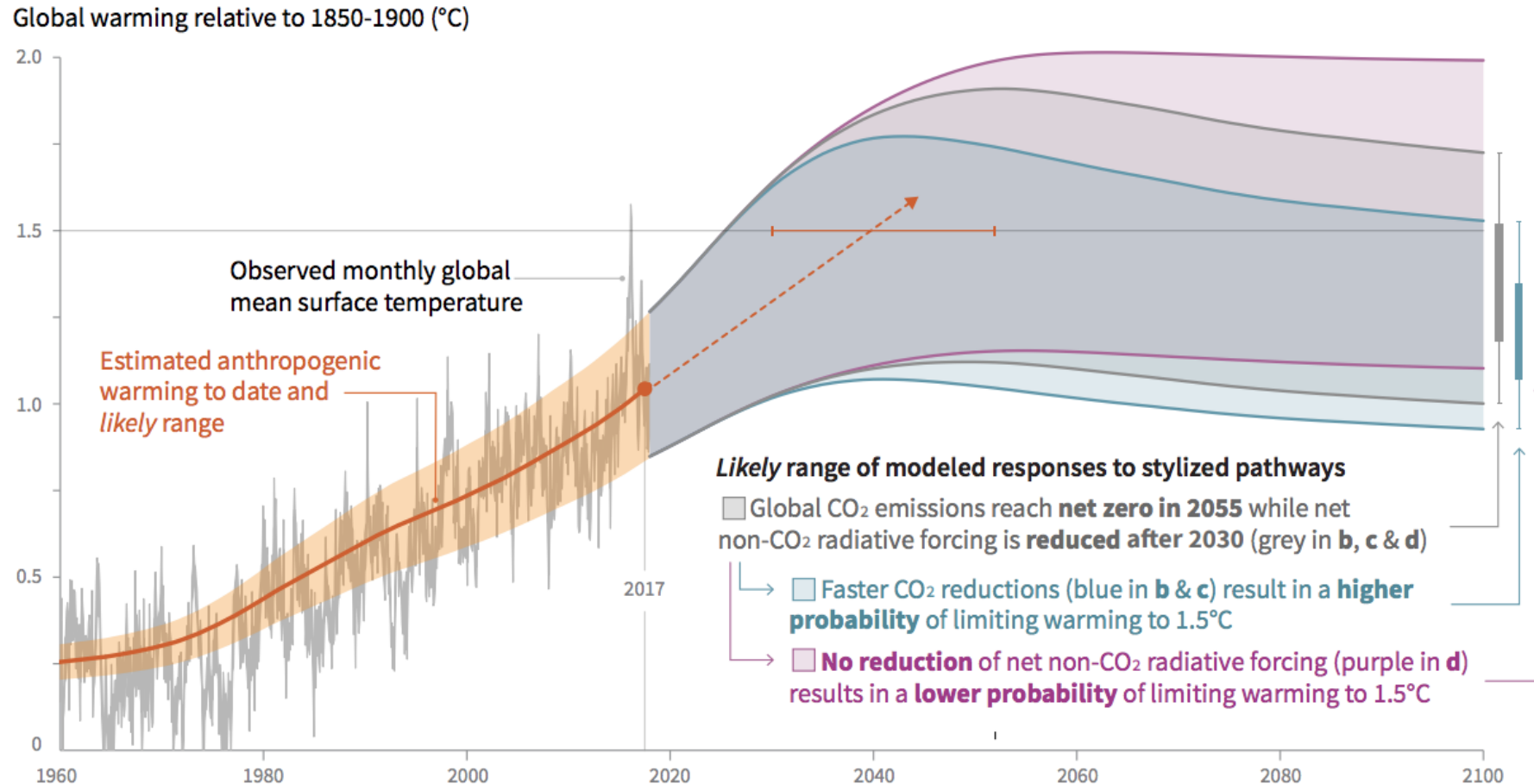
# CMIP



The World Climate Research Programme's  
Coupled Model Intercomparison Project

- » World Climate Research Program(me) Working Group of Coupled Modelling
- » Coordinates climate model experiments involving multiple international modelling teams
- » Focused on refined understanding of past, present and future climate change measurement and variability
- » Defines common experiment protocols and output
- » 5 > 6

# Climate in Projection Space



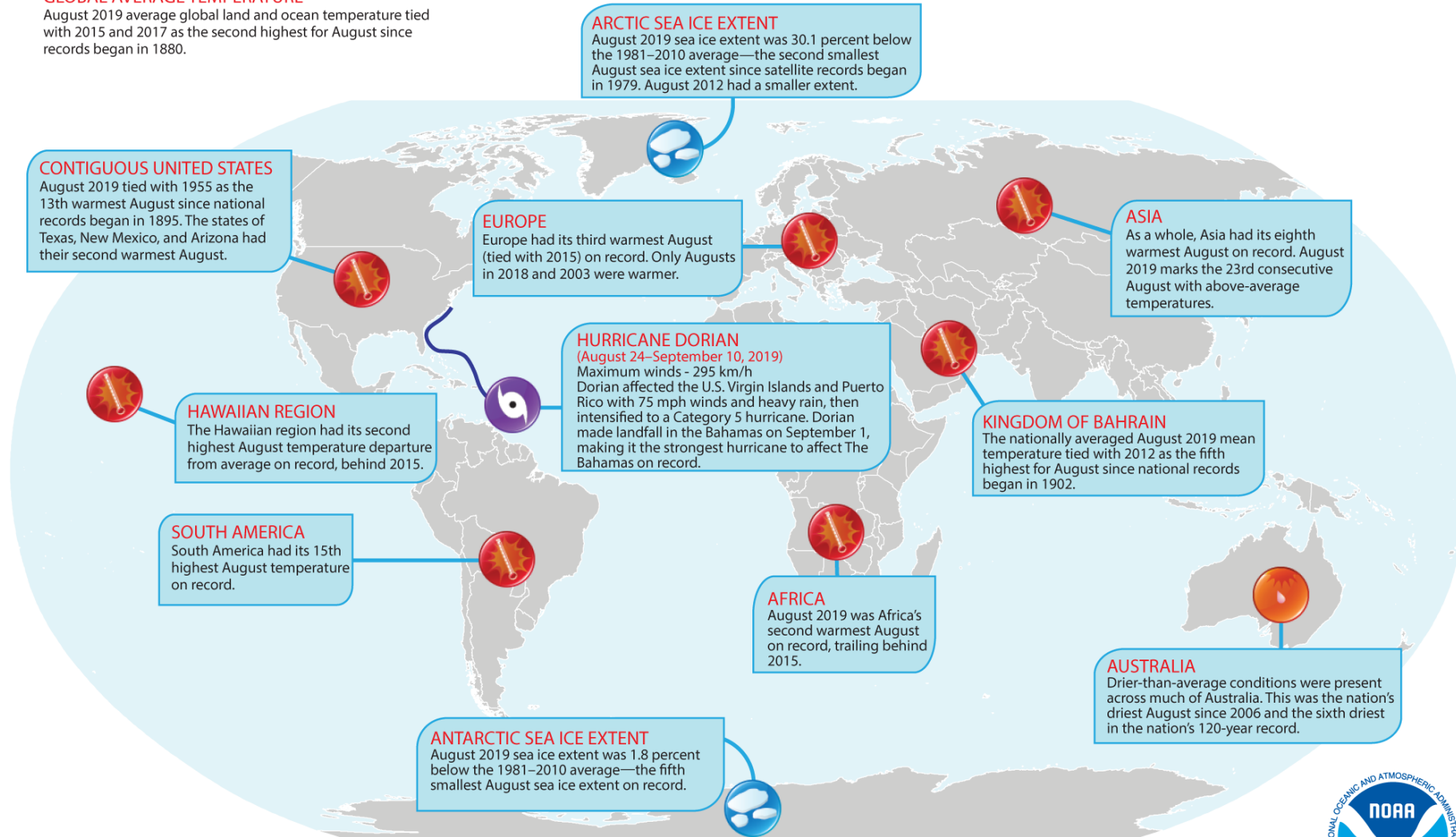


# Selected Significant Climate Anomalies and Events August 2019



## GLOBAL AVERAGE TEMPERATURE

August 2019 average global land and ocean temperature tied with 2015 and 2017 as the second highest for August since records began in 1880.

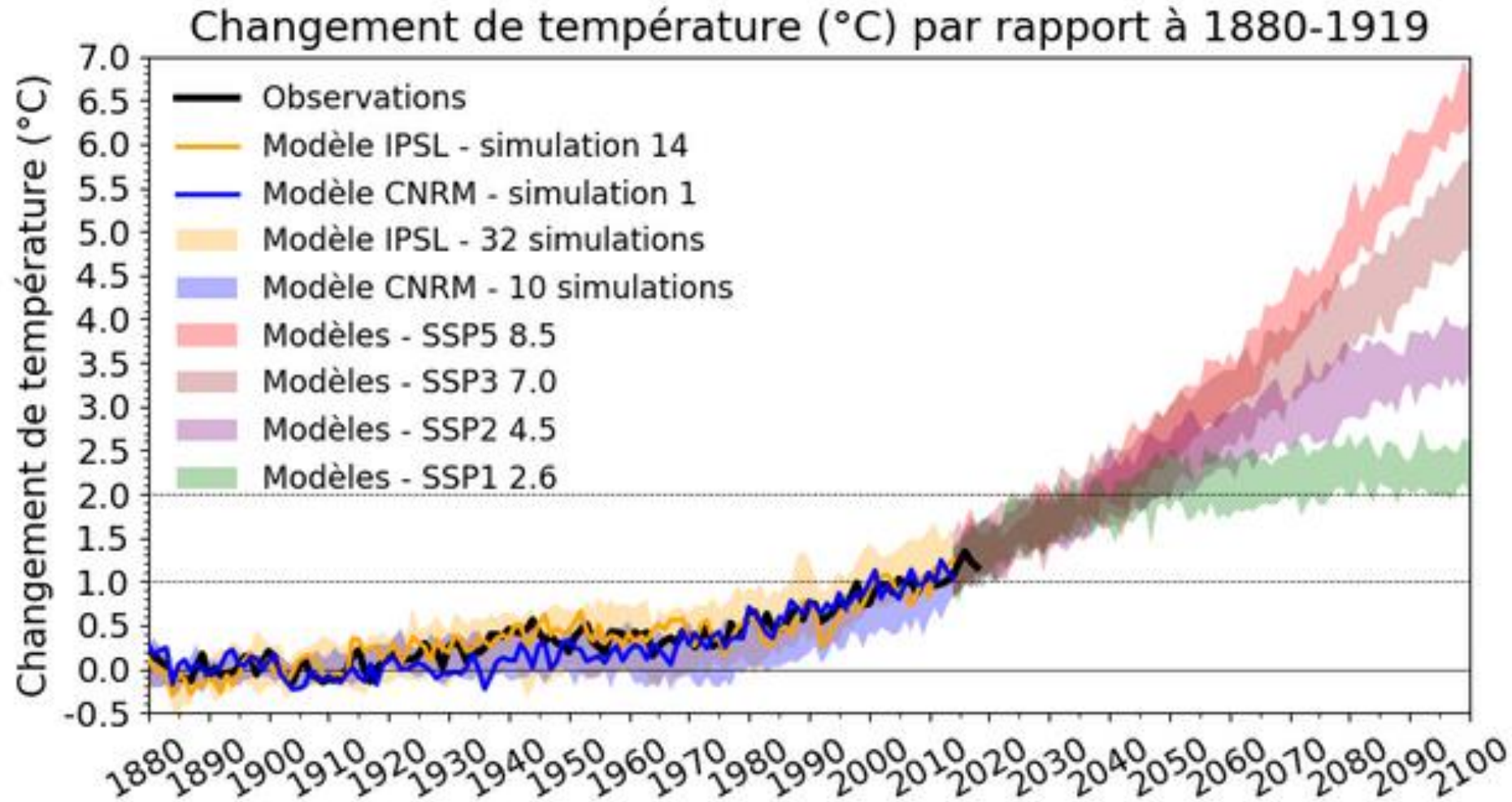


Please Note: Material provided in this map was compiled from NOAA's State of the Climate Reports. For more information please visit: <http://www.ncdc.noaa.gov/sotc>





# CMIP6 – A Glimpse at the Future



[https://www.lemonde.fr/planete/article/2019/09/17/jusqu-a-7-c-en-2100-les-experts-francais-du-climat-aggravent-leurs-projections-sur-le-rechauffement\\_5511336\\_3244.html](https://www.lemonde.fr/planete/article/2019/09/17/jusqu-a-7-c-en-2100-les-experts-francais-du-climat-aggravent-leurs-projections-sur-le-rechauffement_5511336_3244.html)

# 2

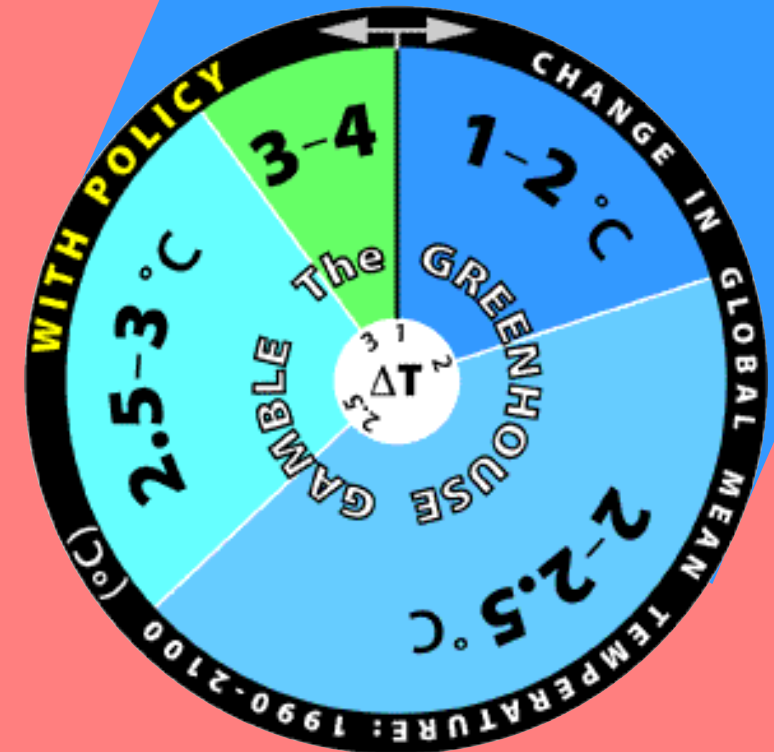
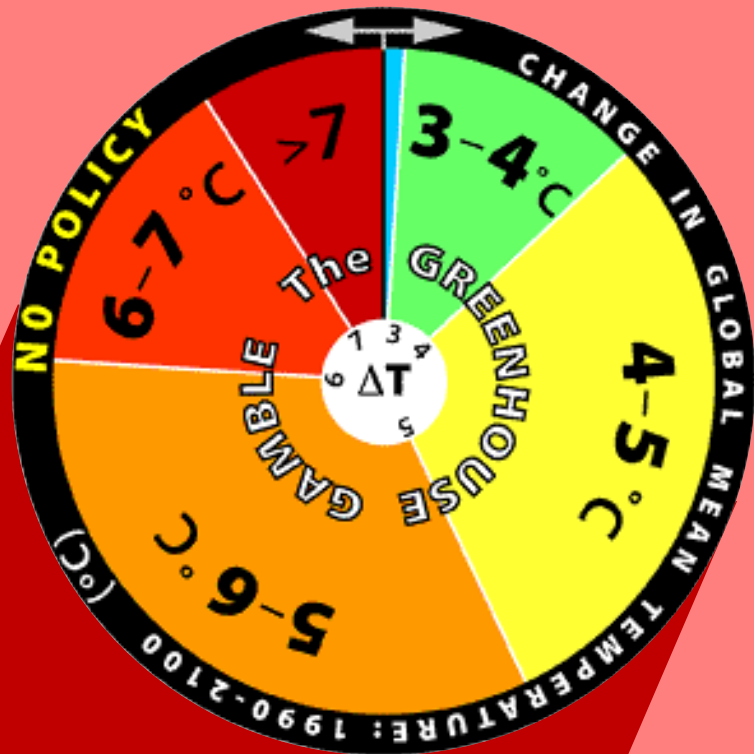
## Climate Risk – The Economics

# Climate Roulette — We Are Spinning the Wheel



Warming Possibilities in 2100

Under Status Quo



With Active Response

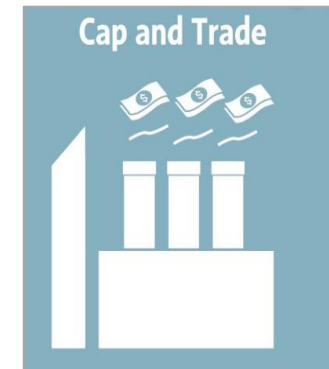
# The Economics of Climate Change

## Cause and Solution



### Economic Solutions:

The root cause is **externality**



# Climate Change Among the Top of Global Economic and Financial Risk



## #1 Economic Risk



## “Climate Minsky” moment!

Mark Carney,  
Chair of the Bank of England and of the  
Financial Stability Board



# How Climate Change Affects Financial Institutions



## Transition Risk

Disruptive technological advances

Governments' climate policy

Firms in sectors affected by the transition

↓ ↑ Impact on profits  
Changes in valuations

Banks, Insurers, institutional investors, etc

Exposure to

Exposure to

## Physical Risk

Extreme weather events

Changing climate conditions

Physical assets, agriculture, workers

↓ Lower asset values  
Lower productivity

**Risk to financial stability:**

- Higher insurance claims
- Portfolio losses
- Sentiment shocks
- Defaults on loans

# Climate Finance and Potential Opportunities



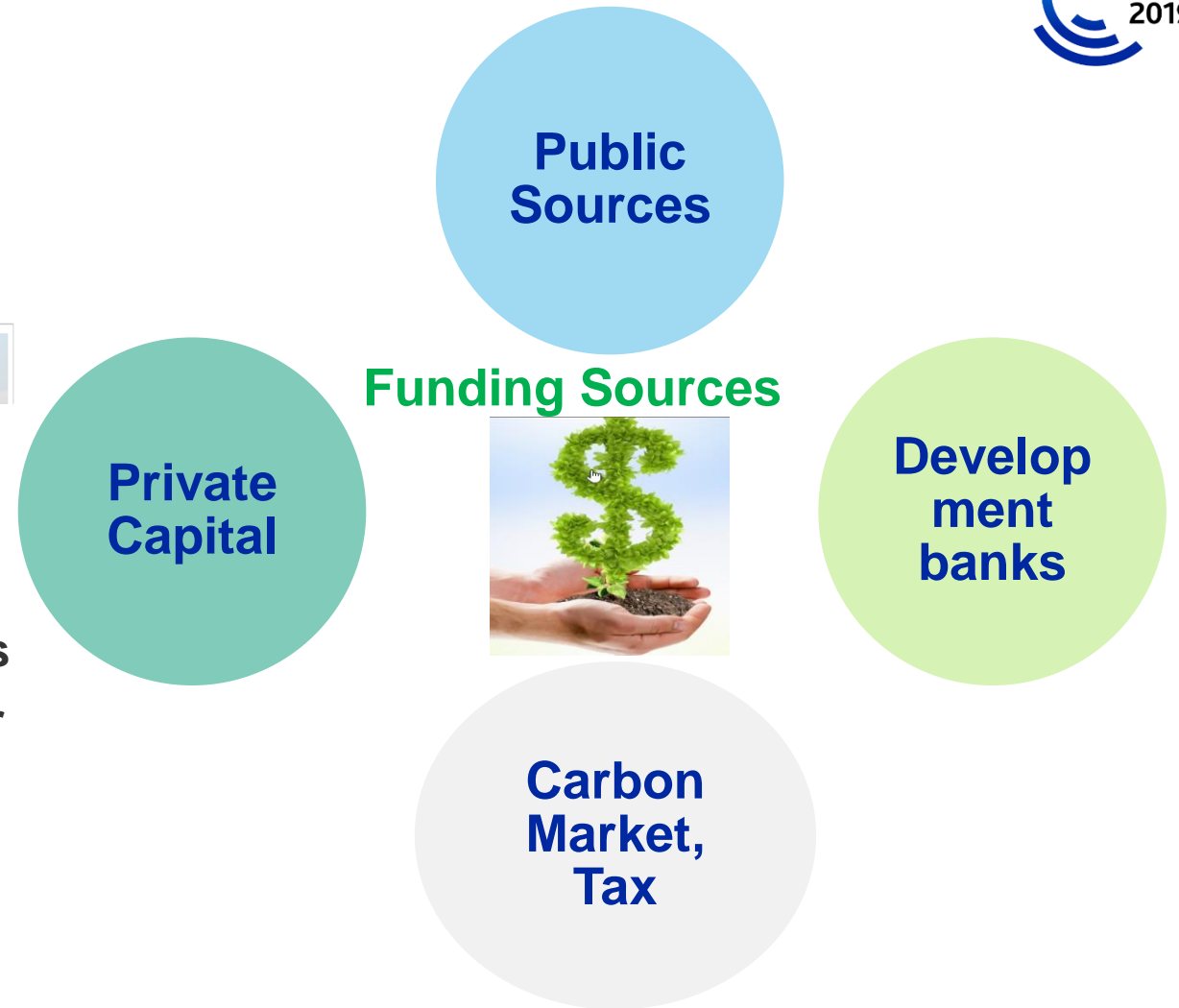
## Press Release: Bold Climate Action Could Deliver US\$26 Trillion to 2030, Finds Global Commission

News Article / September 5, 2018

New report aims to galvanise action by economic and financial leaders in government and the private sector.



- » **Generate over 65 million new low-carbon jobs**
- » **Avoid over 700,000 premature deaths from air pollution**
- » **Generate an estimated US\$2.8 trillion in government revenues per year**





# 3

## Climate Risk – The Time to Act

# Breaking the Tragedy of the Horizon



*“ Climate change is the  
tragedy of the horizon! ”*

***The time to act is now!***

# What Financial Institutions Can Do Now

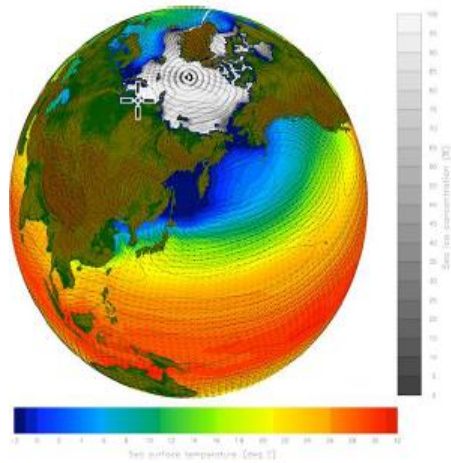


Incorporate climate change into

- » Risk Assessment
- » Disclosure
- » Scenario Analysis
- » Corporate Governance

# From Climate Risk to Credit Risk

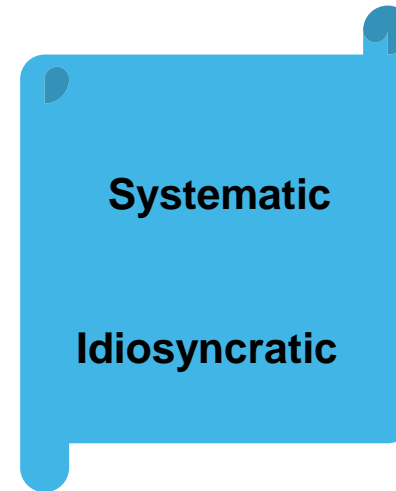
## Scenario Based Approach



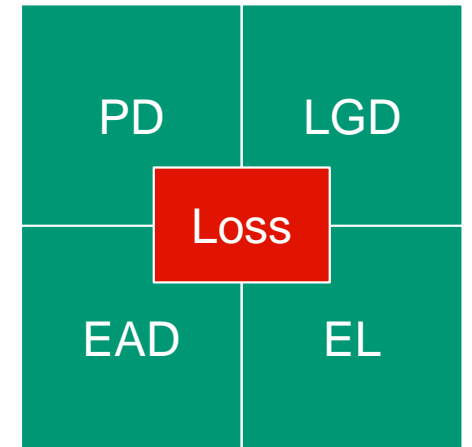
Climate Scenario



Physical Risk Scenario



Risk Factors



Credit Risk Metrics

# What Is Your Institution Doing About Climate Change?



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