



# Climate Change History and way move forward

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## When we started serious discussion

1988: Dr. Hansen, NASA, made Congressional Testimony on Climate Change about the link of CO<sub>2</sub> increase and global temperature rise

1988 : “Toronto Conference on Changing Atmosphere” recommended “20% reduction of CO<sub>2</sub> emission by 2005 from the level of 1988 emission”

1989 : IPCC was established



# IPCC reports and COP negotiations

- 1990 IPCC the First Assessment Report (FAR)
- 1992 UNFCCC opened for signature at Earth Summit in Rio de Janeiro
- 1995 IPCC the Second Assessment Report (SAR)
- 1997 COP3 at Kyoto, Kyoto Protocol
- 2001 IPCC the Third Assessment Report (TAR)
- 2002 COP8 Reaffirming common but differentiated responsibilities
- 2007 IPCC the Fourth Assessment Report (AR4)
- 2009 COP15 at Copenhagen
- 2014 IPCC the Fifth Assessment Report (AR5)
- 2015 COP21 at Paris, Paris Agreement

# Great misunderstandings about IPCC

(Misunderstanding)

IPCC is scientists groups independent from politics and provide recommendations to COP or UNFCCC how to battle the climate change

(Truce)

IPCC is inter-governmental panel needs to require all member countries authorization

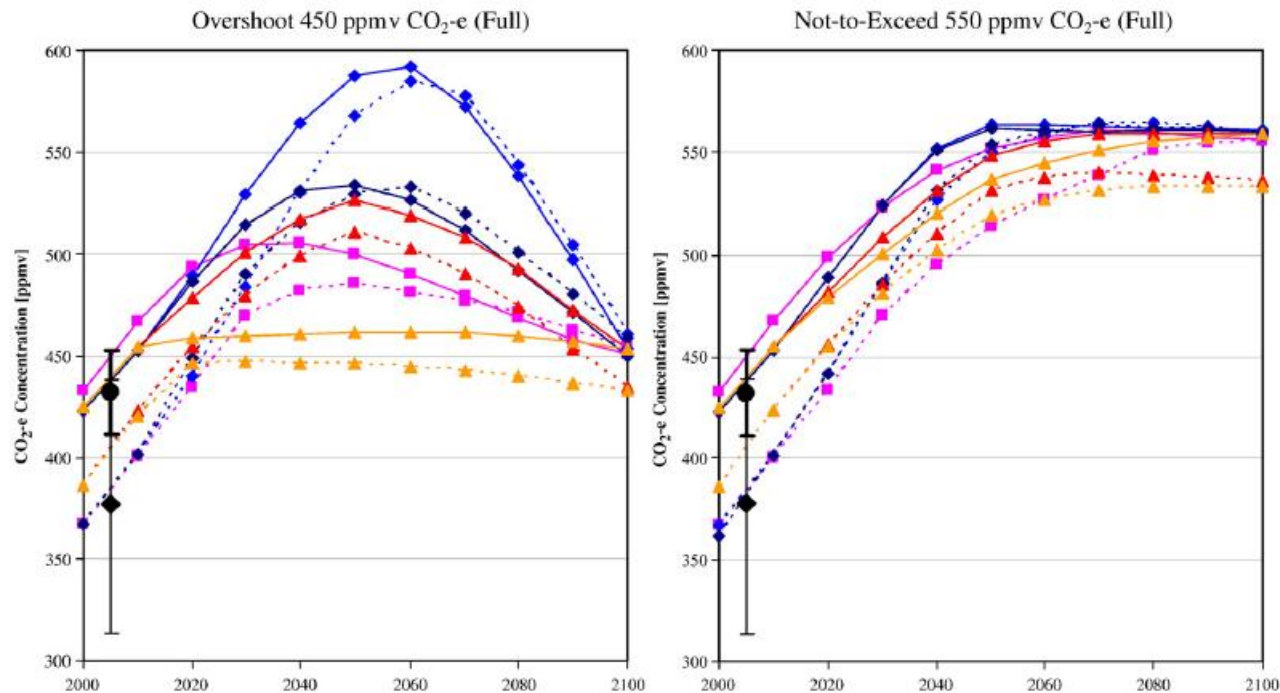
IPCC has no function to recommend anything

(Then all “recommendations” below were actually never said by IPCC)

- 2°C is ultimate target
- 450ppm of GHG concentration is necessary to meet 2°C target
- 80% GHG emission reduction is necessary for developed counties by 2050 to meet 450ppm target

# Deficient of very important Scientific Evident (1) Current GHG concentration

No clear analysis of current total GHG concentration (CO<sub>2</sub> equivalent) in any IPCC reports



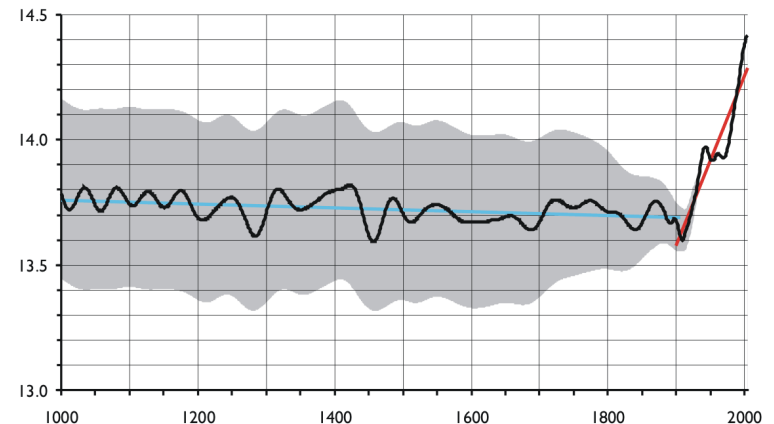
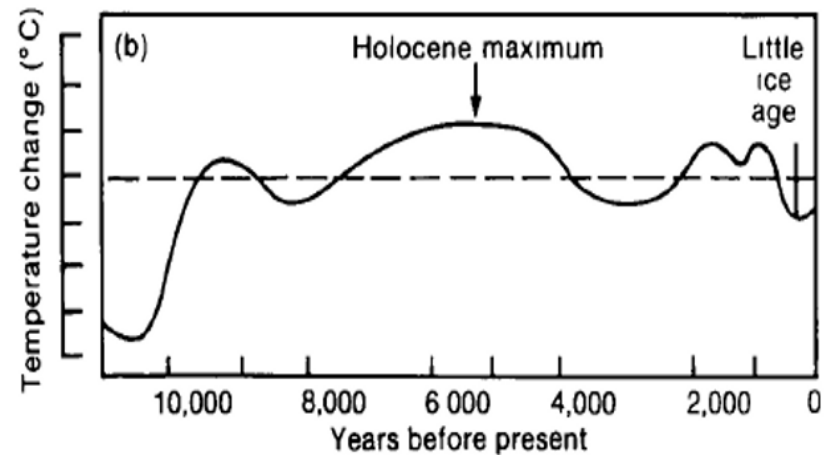
# Deficient of very important Scientific Evidence (2)

## Pre-Industrial temperature

There is no clear description of pre-industrial global average temperature

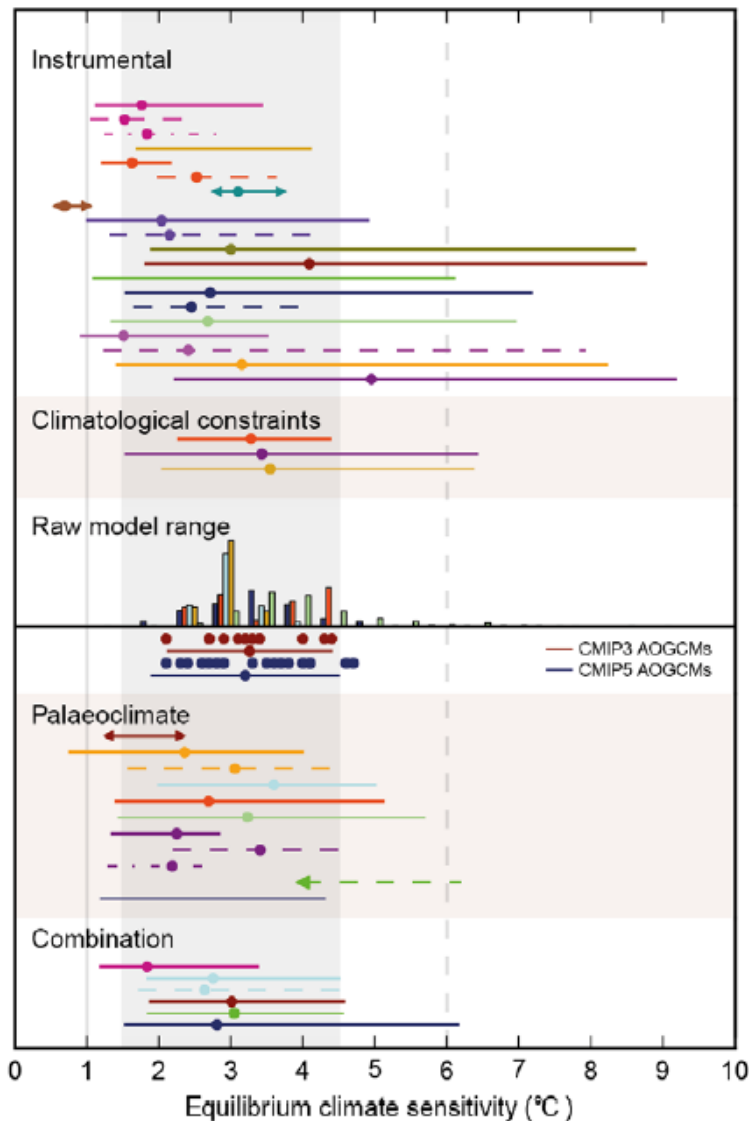
IPCC一次報告書  
(IPCC First Assessment Report)

悪名高きIPCC 三次報告書での  
ホッケースティック曲線  
IPCC Third Assessment Report  
Notorious Hockey Stick Curve



# Deficient of very important science evidence (3) Climate Sensitivity

	66% confidence range	Best Estimate
IPCC First to Third Report	1.5~4.5°C	2.5°C
IPCC the Fourth Assessment	2.0k~4.5°C	3.0°C
IPCC the Fifth Assessment	1.5~4.5°C	no consensus
AR5 WG3 used		3.0°C



# Impact of different climate sensitivity

気候感度3.0°Cの場合					
RCPシナリオ名	温室効果ガス濃度		オーバーシュートの有無	21世紀末の気温上昇	
				10%~90%信頼区間	2°Cを下回る確率
RCP2.6	450ppm (430-480ppm)		○	1.5-1.7°C (1.0-2.8°C)	66%-100%
WG I で検討しなかったシナリオ	500ppm (480-530ppm)		×	1.7-1.9°C (1.2-2.9°C)	50%-100%
	550ppm (530-580ppm)		○	1.8-2.0°C (1.2-3.3°C)	33%-66%
			×	2.0-2.2°C (1.4-3.6°C)	0%-50%
RCP4.5	580-720ppm	580-650ppm	×	2.1-2.3°C (1.4-3.6°C)	
		650-720ppm	×	2.3-2.6°C (1.5-4.2°C)	
RCP6.0	720-1000ppm		×	2.6-2.9°C (1.8-4.5°C)	
				3.1-3.7°C (2.1-5.8°C)	

気候感度2.5°Cの場合					
RCPシナリオ名	温室効果ガス濃度		オーバーシュートの有無	21世紀末の気温上昇	
				10%~90%信頼区間	2°Cを下回る確率
RCP2.6	450ppm (430-480ppm)		○	1.3-1.4°C (0.8-2.3°C)	66%-100%
WG I で検討しなかったシナリオ	500ppm (480-530ppm)		×	1.4-1.6°C (1.0-2.7°C)	
			○	1.5-1.7°C (1.0-2.8°C)	
	550ppm (530-580ppm)		×	1.7-1.8°C (1.2-3.0°C)	50%-100%
RCP4.5	580-720ppm	580-650ppm	×	1.8-1.9°C (1.2-3.0°C)	33%-66%
		650-720ppm	×	1.9-2.2°C (1.3-3.5°C)	
RCP6.0	720-1000ppm		×	2.2-2.4°C (1.5-3.8°C)	0%-50%
				2.6-3.1°C (1.8-4.8°C)	33%以下



RCPシナリオ名	気候感度2.0°Cの場合			
	温室効果ガス濃度	オーバーシュートの有無	21世紀末の気温上昇	
			10%~90%信頼区間	2°Cを下回る確率
RCP2.6	450ppm (430-480ppm)	○	1.0-1.1°C (0.7-1.9°C)	90%以上
WG I で検討しなかったシナリオ	500ppm (480-530ppm)	×	1.1-1.3°C (0.8-1.9°C)	66%-100%
		○	1.2-1.3°C (0.8-2.2°C)	
	550ppm (530-580ppm)	×	1.3-1.5°C (0.9-2.4°C)	
		○	1.4-1.5°C (0.9-2.4°C)	
RCP4.5	580-720ppm	580-650ppm	×	1.5-1.7°C (1.0-2.8°C)
		650-720ppm	×	1.7-1.9°C (1.2-3.0°C)
RCP6.0	720-1000ppm	×	2.1-2.5°C (1.4-3.9°C)	0%-50%

Impact of difference of climate sensitivities is significant.

WE COULD NOT MAKE ANY SERIOUS DECISION  
IF CLIMATE SENSITIVITIES IS SO UNCLEAR.

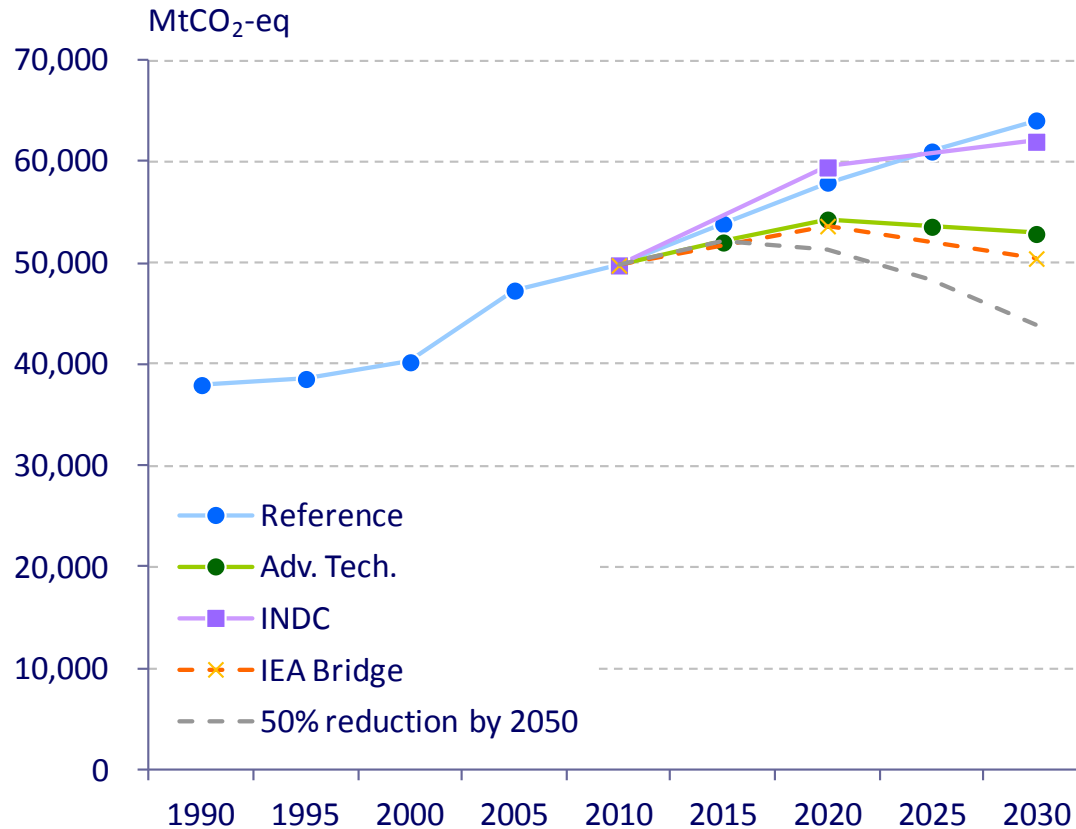
# Progress between UNFCCC and Paris Agreement

Last 23years international efforts have made some progress but not so much

	Year	Aim of convention	All Party	Developed countries	Relation between developed and developing countries	Review
UNFCCC	1992	Stabilization of greenhouse gas concentrations in the atmosphere at level that could prevent dangerous anthropogenic interference	Formulate, implement, published and regularly update nation programmers containing measure to mitigate climate change by addressing anthropogenic emission by sources	Returning individually or jointly to their 1990 level of emission of GHG	common but differentiated responsibility	review by the end of 1998
Paris Agreement	2015	Holding the increase in global average temperature to well below 2°C above pre-industrial levels and pursue effort to limit temperature increase to 1.5°C	Parties shall provide their intended nationally determined contributions (NDCs) every five years	(None)	common but differentiated responsibility	Review global stocktake every five years started in 2023

# Analysis of combined INDCs by IEEA

IEEJ own analysis showed the combined INDCs is similar to the Business As Usual case



# Necessity of Innovations of new technologies

To achieve total zero emission of GHGs within this century, there is absolute necessity of innovation of technologies such as Artificial photosynthesis, nuclear fusion or Space-based solar power

The banner features a globe on the left, surrounded by stylized green and yellow leaves. The background is a light blue cityscape silhouette. The text is centered and right-aligned.

## Innovation for Cool Earth Forum 3<sup>rd</sup> Annual Meeting

Date: **October 5-6, 2016**

Venue: **Hotel Chinzanso Tokyo, Japan**

# Conclusions

- IPCC may need to be reformed as independent purely academic organization and have function to recommendation of action to international societies including UNFCCC
- To speed up current COP negotiation procedure, we may need supporting group such as regional or coalition of willing (similar to TPP against WTO)