Global Climate Change and China

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Climate does Change ! Just like Seasons !!

http://all-free-download.com/free-photos/download/the_four_seasons_209357.html

Is Our Beautiful Earth Getting Sick?

http://epic.gsfc.nasa.gov/

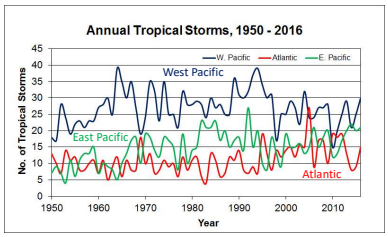
Earth Polychromatic Imaging Camera (EPIC)

It seems that we are experiencing more natural disasters!

http://www.noaa.gov/features/04_resources/fire2.html
http://www.noaa.gov/features/monitoring_0209/images/drought.jpg
http://www.nesdis.noaa.gov/fourbox/04-29-13/

Hurricanes

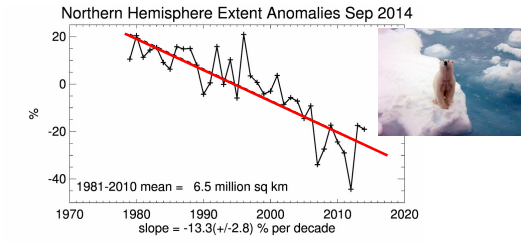
http://oceanservice.noaa.gov/hazards/hurricanes/



Outline

- Evidences of Climate Change
- Causes for Climate Change
- Carbon Dioxide and Climate Change
- China's role in Climate Change
- Impacts of Climate Change
- Paris Agreement will Fail
- Future Climate

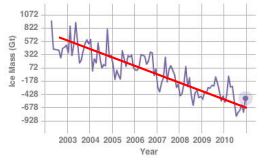
Polar Ice is Melting Rapidly!



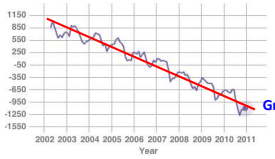
http://www.noaa.gov/features/monitoring_1008/arcticice.html

http://www.arctic.noaa.gov/detect/ice-seaice.shtml

Shrinking ice sheets due to warming!



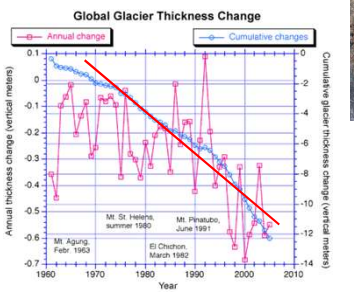
Antarctic land ice mass decreasing



Greenland land ice mass decreasing

http://climate.nasa.gov/evidence

Glaciers are retreating!

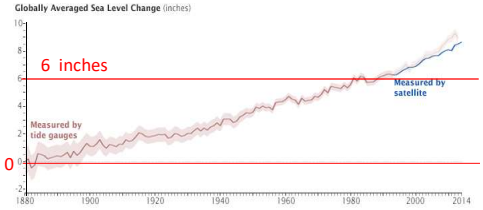


The disappearing snowcap of Mount Kilimanjaro.

http://nsidc.org/cryosphere/sotc/glacier_balance.html

http://nsidc.org/data/glacier_photo/special_high_res_qorikalis.html
http://nsidc.org/data/glacier_photo/special_high_res.html

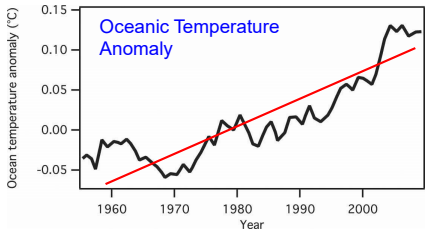
Global Sea Level has been Rising by more than 6 inches in 130 years!



http://earthobservatory.nasa.gov/IOTD/view.php?id=86655&src=eoa-iotd

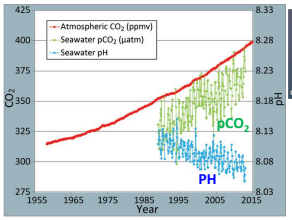
Warming oceans

The oceans have absorbed much of global heat, with the top 700 meters (about 2,300 feet) of ocean showing warming of 0.168°C (0.302°F) since 1969.



http://climate.nasa.gov/evidence

Ocean acidification (OA) worsens



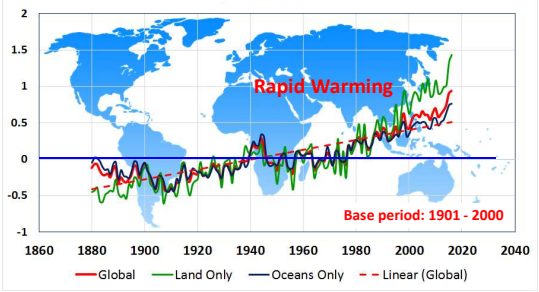
This graph shows the correlation between rising levels of carbon dioxide (CO_2) in the atmosphere at Mauna Loa with rising CO_2 levels in the nearby ocean at Station Aloha. As more CO_2 accumulates in the ocean, the pH of the ocean decreases. (modified after R. A. Feely, Bulletin of the American Meteorological Society, July 2008).

pCO_2: partial carbon dioxide pressure

More carbon dioxide in the ocean, more acid of the water

http://www.pmel.noaa.gov/co2/story/Ocean+Acidification

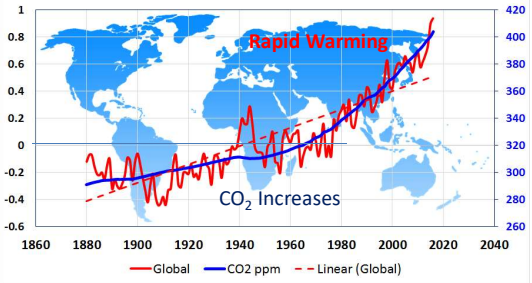
Global/Land/Oceans Temperature Anomalies (°C) 1880 – 2016



Data from http://www.ncdc.noaa.gov/monitoring-references/faq/anomalies.php#anomalies

Global Temperature anomalies (°C) vs CO_2 (ppm), 1880 – 2016

Period of base temperatures: 1901 - 2000



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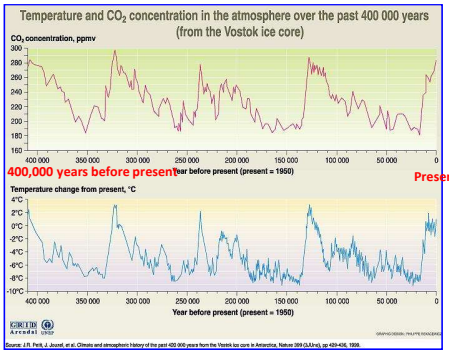
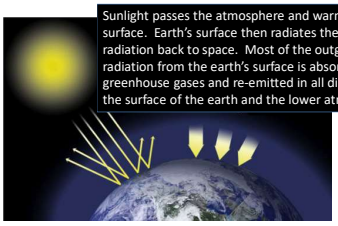


Correlation is not causation!

Atmospheric Greenhouse Effect



Sunlight passes the atmosphere and warms the earth's surface. Earth's surface then radiates the longwave radiation back to space. Most of the outgoing longwave radiation from the earth's surface is absorbed by the greenhouse gases and re-emitted in all directions, warming the surface of the earth and the lower atmosphere.

Greenhouse Gases

Too much greenhouse effect
T = 462°C

Venus

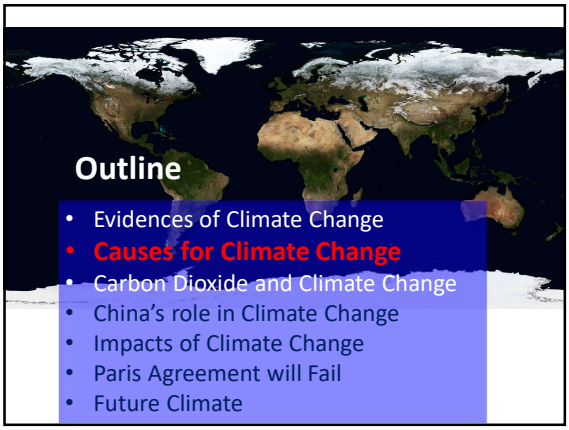
No greenhouse effect
T = -60°C

Mars

http://climate.nasa.gov/causes/

Our Earth is at the right distance from the sun, and it has the right composition of gases in the atmosphere to provide us with the right amount of greenhouse effect, so that we can survive comfortably at 15°C!

Thanks! Atmospheric Greenhouse Effect



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- **Causes for Climate Change**
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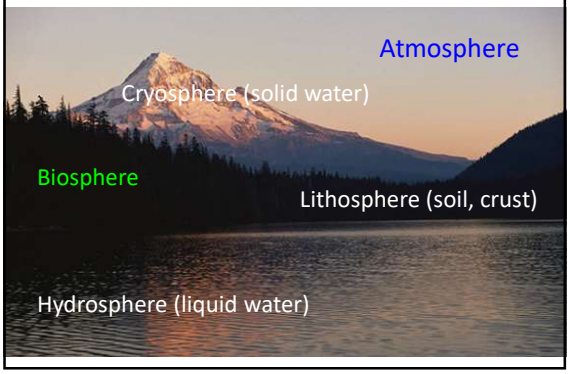
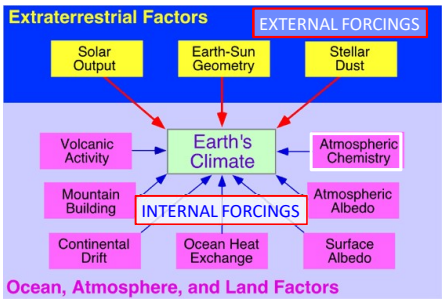
One Earth, One Climate System



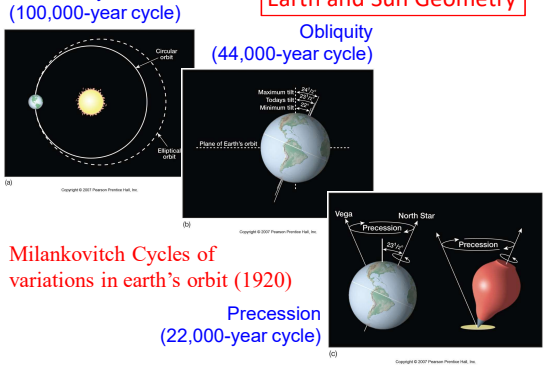
Causes for Climate Change



Earth and Sun Geometry

Eccentricity (100,000-year cycle)

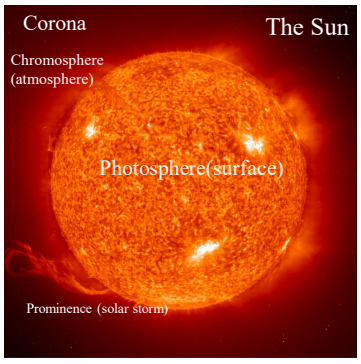
Obliquity (44,000-year cycle)



Milankovitch Cycles of variations in earth's orbit (1920)

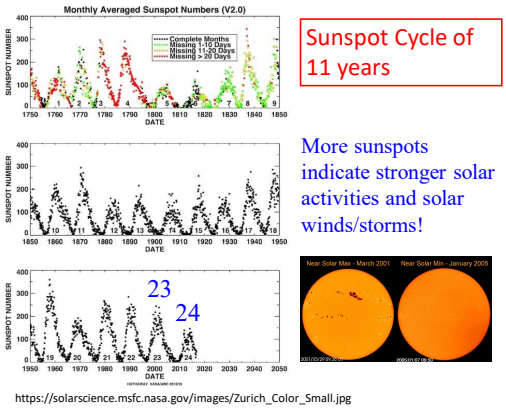
Precession (22,000-year cycle)

Solar Output



D: 1,390,000 km
Mass: 1.989×10^{30} kg
T: 5,800 K (surface)
15,600,000 K (core)

A gaseous body:
74% Hydrogen
24% Helium



Sunspot Cycle of 11 years

More sunspots indicate stronger solar activities and solar winds/storms!

https://solarscience.msfc.nasa.gov/images/Zurich_Color_Small.jpg

Internal Forcings

- Continental drift/polar wandering
- Topography/mountain building/sea floor spreading
- Land and sea distribution
- **Volcanic eruptions**
- **Variations of atmospheric compositions**
- **Snow and ice cover**

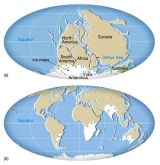
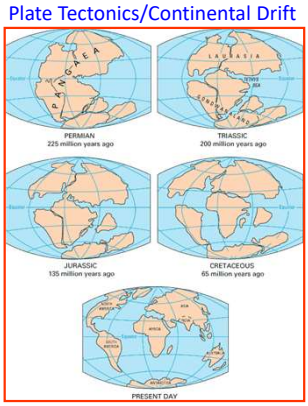


Plate Tectonics/Continental Drift

Internal Forcings



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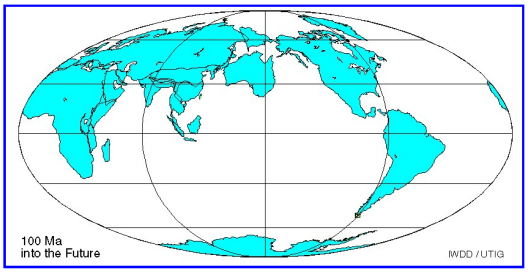
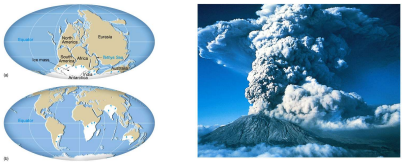


The geography of the earth in 100 million years from now!

Internal Forcings

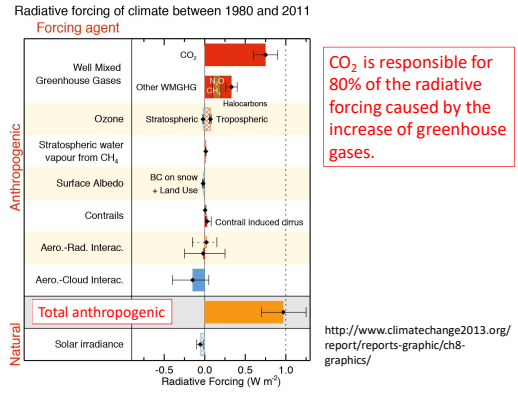
- Continental drift/polar wandering
- Topography/mountain building/sea floor spreading
- Land and sea distribution
- **Volcanic eruptions !!!**
- **Variations of atmospheric compositions !!!**
- **Snow and ice cover !!!**



How to determine Climate Forcings?
Represent them in w/m², therefore they are called "radiative forcings".

Radiative forcing is a direct measure of the amount that the Earth's energy budget is out of balance, thereby contributing to climate change.

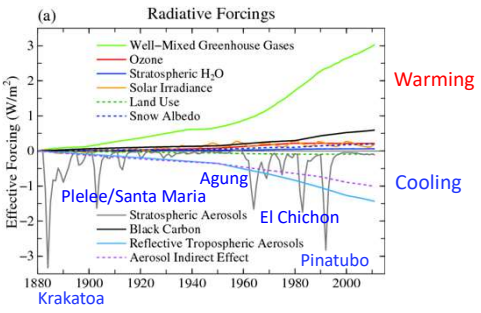
https://pixabay.com/en/sunset-sun-abendstimmung-1626515/



CO_2 is responsible for 80% of the radiative forcing caused by the increase of greenhouse gases.

http://www.climatechange2013.org/report/reports-graphic/ch8-graphics/

Climate Forcings since 1880

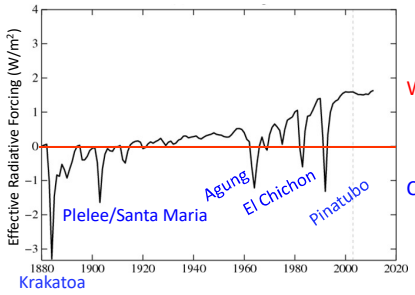


Warming

Cooling

http://data.giss.nasa.gov/modelforce/

Net Climate Forcing since 1880



Warming

Cooling

http://data.giss.nasa.gov/modelforce/

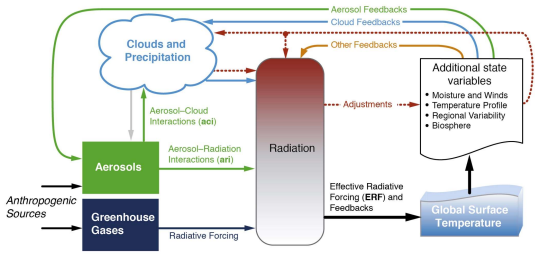
How about Climate Feedback Mechanisms?

Climate feedbacks are processes that change as a result of a change in forcing, and cause additional climate change.

The **positive feedback** amplifies the initial change; while the **negative feedback** reduces it.

Climate Feedback is a cause-effect cycle that may amplify (positive feedback) or dampen (negative feedback) the initial change after the cycle is completed.

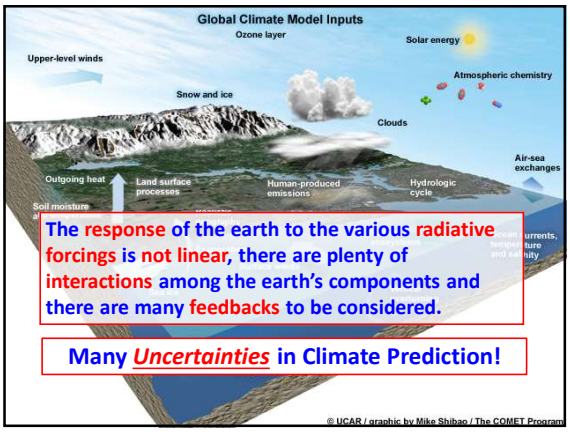
Climate feedbacks



http://www.climatechange2013.org/images/figures/WGI_AR5_Fig7-1.jpg

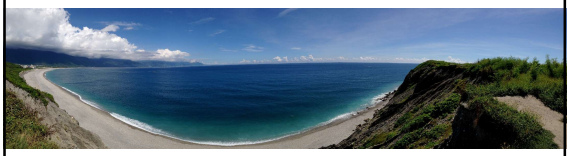
In summary, climate changes due to

- External and Internal Natural Forcings
- Interactions and feedbacks
- The increased concentration of carbon dioxide contributes to the global warming since 1950's, and it has therefore caused the global climate to change.
- Most carbon dioxide emission comes from the burning of fossil fuel (coal, oil, natural gas) for energy use.



We have Uncertainties in observing and understanding the earth's climate!

Such as Aerosols, Clouds, Ocean Circulation, Carbon Cycles, and Precipitation



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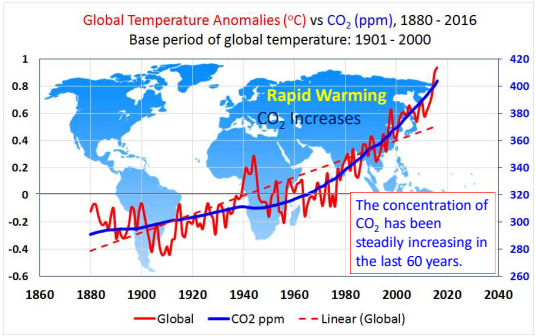
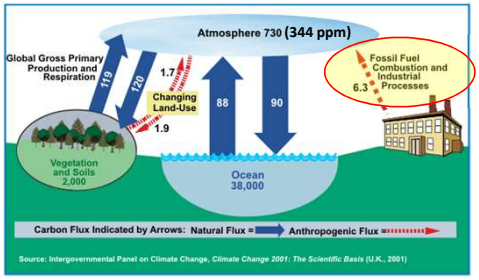


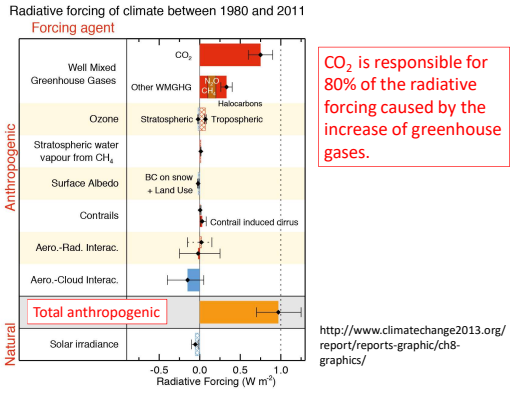
Global Carbon Cycle



http://www.esrl.noaa.gov/research/themes/carbon/

Reservoir sizes in GtC, Fluxes and Rates in GtC/year

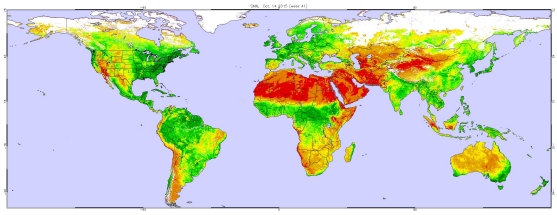
1 GtC = 1Giga-tonne = 10^{12} Kg = 3.67 Gt CO_2
1 ppmv = 2.12 GtC = 7.8 Gt CO_2



CO_2 is responsible for 80% of the radiative forcing caused by the increase of greenhouse gases.

http://www.climatechange2013.org/report/reports-graphic/ch8-graphics/

Assuming the increased concentration of carbon dioxide is responsible for the warming of the atmosphere, so which countries are emitting most carbon dioxide?



http://www.star.nesdis.noaa.gov/smcd/emb/vci/gvix_webImages/2015/WorldBig_SMN_201541.png

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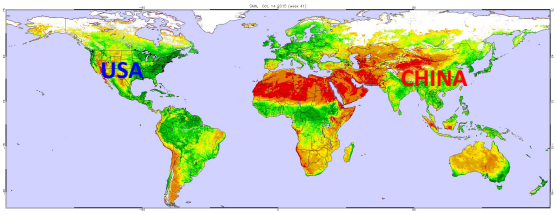

http://www.star.nesdis.noaa.gov/smcd/emb/vci/gvix_webImages/2015/WorldBig_SMN_201541.png

Both China and US emit significant amounts of carbon dioxide to the atmosphere

#1 – China **(28.4%)**
(Photo by *Sean* Barnard/Flickr)

#2 – USA **(14.5%)**
(Photo by Kevork Djansezian/Getty Images)

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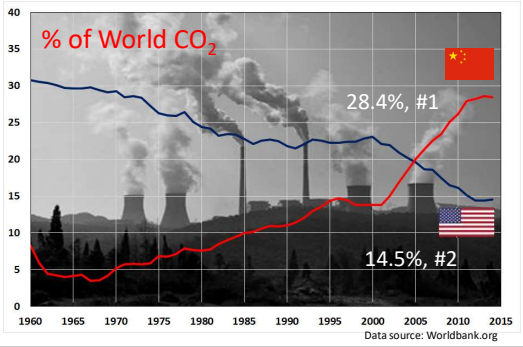
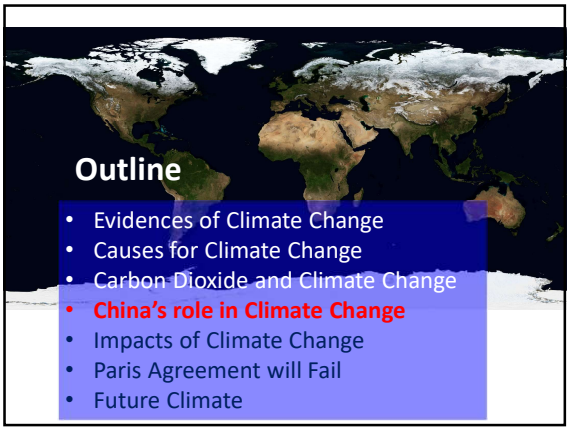


Data source: Worldbank.org



What is China (People's Republic of China, PRC)?

- Located in Asia
- 5,000 years of history and 2,300 years of written language
- PRC was established in 1949 (note: ROC in 1912)
- Fourth largest country in the world
- Total land area: 3.7 million square miles
- Most populous country with 1.389 billion people (2016)
- 56 ethnic groups, 91% people are Han's
- Beijing is the capital with 21 million people
- Shanghai is the largest city with 23 million people
- Official language is Mandarin
- One party government, Communist Party
- One time zone: China Standard Time zone (UTC +8)

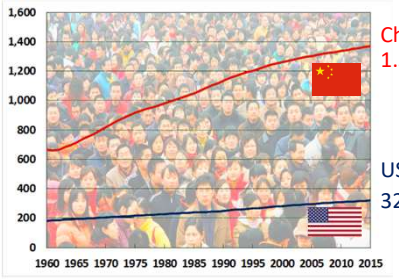
Role of China in Global Climate Change

- China is a global economic powerhouse
- China is the world's smokestack
- China is a political and military superpower

Comparison of China and US (2015)

	United States	China
Status	Developed Country	Developing Country
Gross Domestic Product	$17.9 trillion	$10.9 trillion
Population	319 million	1.37 billion
GDP per capita	$59,561	$7,956
Total CO_2 emission in metric tons	5.31 billion (2nd)	9.32 billion (1st)
CO_2 emission in metric tons per capita	16.6 (10th)	6.8 (58th of 188 countries)
http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm		Source: WorldBank.org

Population (million)

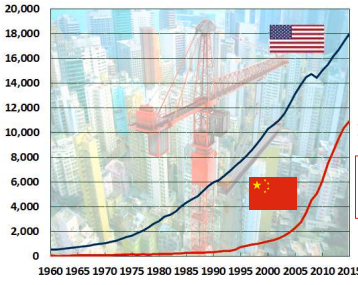


China
1.37 billion, #1

USA
321 million, #3

Data source: Worldbank.org

GDP (billion USD)



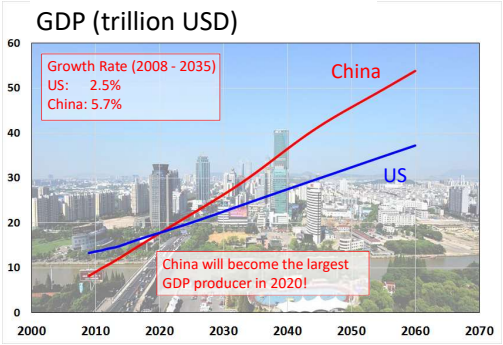
17.9 trillion, #1

10.9 trillion, #2

Rapid economic growth demands tremendous energy (electricity!)

Data source: Worldbank.org

GDP (trillion USD)



Rapid economic growth demands tremendous energy (electricity!)

https://data.oecd.org/gdp/gdp-long-term-forecast.htm#indicator-chart

China's rapid economic development in the last 30 years is because:

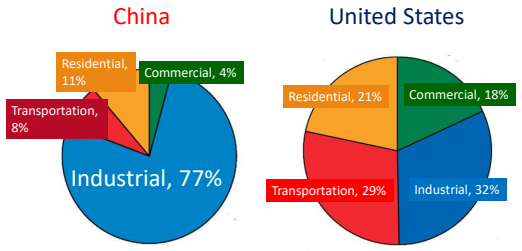
1. After Cultural Revolution (1966-1976), the society is stabilized;
2. Deng Xiaoping's "Four Modernization" in 1978;
3. Deng Xiaoping's "Open-door Policy" for foreign direct investments in 1986;
4. Rural entrepreneurship in 1980s;
5. Establishing "socialist market economy";
6. Manufacturing booming;
7. Massive and cheap labor force;
8. Joining World Trade Organization (WTO) in 2001;
9. Globalization;
10. Rapid expanding domestic infrastructure and market.

China is hunger for energy !

China's Key Energy Statistics	World Rank
Total Primary Energy Production (95.829 Quadrillion BTU, 2014)	1
Total Primary Energy Consumption (123.184 Quadrillion BTU, 2014)	1
Primary Coal Production (4.270 million short tons, 2014)	1
Total Petroleum Consumption (12.020 million per day, 2015)	2
Total Energy Net Generation (5.388 billion kilowatthours, 2014)	1

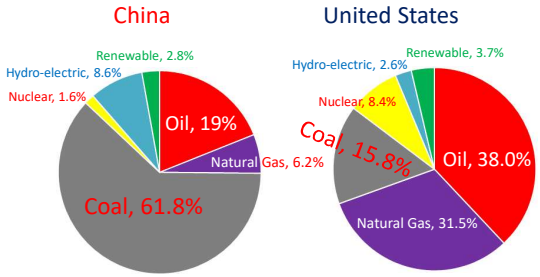
http://www.eia.gov/beta/international/country.cfm?iso=CHN

Comparison of Energy Use in China and US



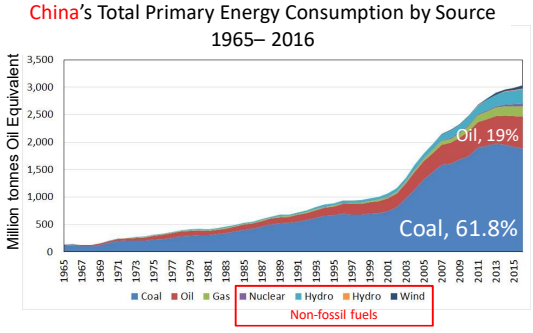
Data from Energy Information Administration
http://astrohow.org/energy/energy_breakdown.html

Comparison of 2016 Energy Source in China and US



Data from BP World Energy Book (2017)

China's Total Primary Energy Consumption by Source 1965– 2016



Data from BP World Energy Book (2017)

Why should China be concerned about climate change?

- Climate change hinders economic growth and political stability
- Climate change impacts people's lives and properties
- Climate change interrupts agriculture production
- Climate change affects energy security
- China is under international pressure for actions

What should China do about climate change?

China has to

- continue its economic development
- maintain political stability
- mitigate the impacts of climate change
- reduce the dependency of coal
- upgrade its infrastructure of industry
- defend its international reputation

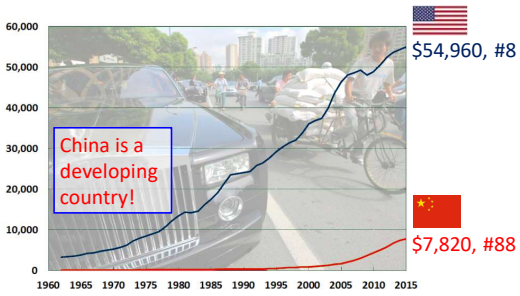
China's Policies and Actions for Addressing Climate Chang by the National development and Reform Commission, PRC (2012)

Goals:

- To reduce energy consumption per unit of GDP by 16 percent by 2015 from the level in 2010.
  (23% reduction in 2016)
- Cut CO_2 emissions per unit of GDP by 17 percent by 2015 (40% by 2020) compared to 2005 levels.
  (37% reduction in 2014)
- Raise the proportion of non-fossil fuels in the overall primary energy mix to 11.4% by 2015.
  (12.5% in 2016)

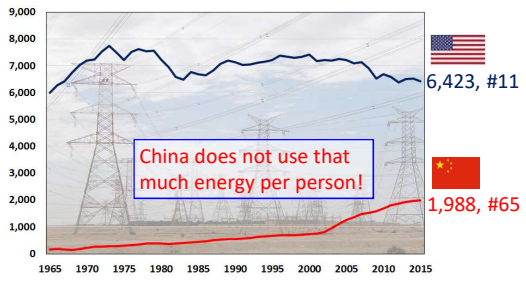
Is China serious about dealing with the issues of climate change?

GNI per capita, Atlas method (USD)



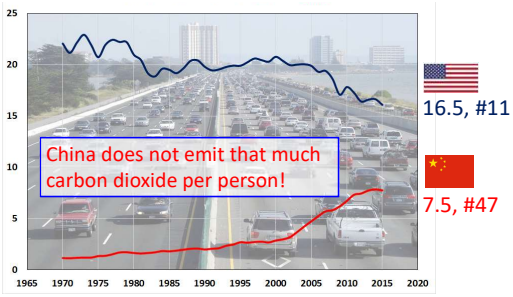
Data source: Worldbank.org

Energy Use (kg of oil equivalent per capita)



Data source: Worldbank.org

CO_2 per capita (tons per person), China vs US



Data source: Worldbank.org

Is China serious about dealing with the issues of climate change?

What do you think?

What is going on in China?

- Rapid economic growth demands tremendous energy (electricity!)
- Political stability is critical while economic grows and freedom expands
- Polarized societies (the wealthy vs the poor)
- Lack of check and balance
- Government corruption
- Human greed
- Global demanding
- Consumerism
- Communist capitalism

China's Challenges in the 21st century

- Pollutions
- Water scarcity
- Economic disparity
- Imbalanced developments between east and west
- Social unrest
- Governmental accountability and anti-corruption
- Population growth and aging population
- Quality of citizenry
- Education inequality
- Rebalancing economy
- **Climate change**

Summary

- Climate change is happening in China;
- China plays a significant role in Global Climate Change;
- China faces environmental crises generated by rapid economic growth and high energy demand;
- China recognizes and acts upon issues of climate change;
- Actions demand dramatic transformation in infrastructure in China;
- China steps up to deal with climate change as the leader of the world;
- Continued economic growth and secured political status are the concerns of the Chinese government.

Outline

- Evidences of Climate Change
- Causes for Climate Change
- Carbon Dioxide and Climate Change
- China's role in Climate Change
- **Impacts of Climate Change**
- Paris Agreement will Fail
- Future Climate

Climate Change Affects Everything that Everyone Does Everywhere !

http://epa.gov/climatestudents/impacts/effects/index.html

What to Expect in Climate Change?

- Accelerating sea level rise and increased coastal flooding
- Increased oceanic acidity
- More frequent and intense heat waves
- Increased extreme weather events (drought and flooding)
- Widespread forest fires
- Shortage of fresh water
- Changing seasons
- Migration of animals and plants
- Destruction of coral reefs
- Growing health impacts

http://epa.gov/climatestudents/impacts/signs/index.html

What can we DO about climate change?

- Develop renewable energy
- Advance green technology
- Strengthen international cooperation
- Accelerate balanced economic progress
- Do your share of protecting the environment

http://epa.gov/climatestudents/impacts/effects/index.html

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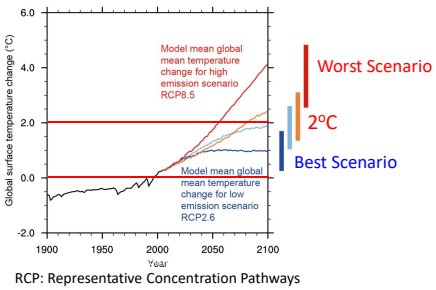
Will the 2015 Paris Agreement Succeed in Reducing Global Carbon Dioxide Emissions?

Predicted Global Surface Temperatures

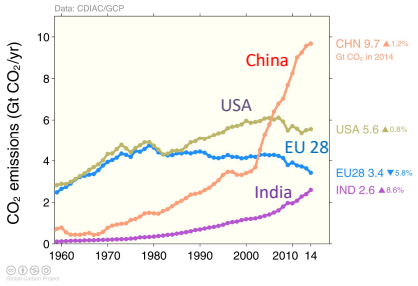


RCP: Representative Concentration Pathways

Figure from IPCC

Top fossil fuel emitters

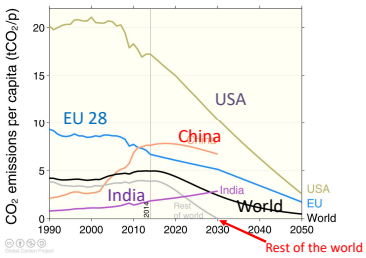
The top four emitters in 2014 covered 59% of global emissions
China (27%), United States (15%), EU28 (10%), India (7%)



Bunker fuels are used for international transport is 3.0% of global emissions
Statistical differences are between the global estimates and sum of national totals is 1.1% of global emissions
Source: CDIAC; Le Quéré et al 2015; Global Carbon Budget 2015

The emission pledges of the top - 4 emitters

To remain consistent with 2°C and given the emission pledges from the US, EU, China, and India, the 'Rest of the World' would need zero per capita emissions by 2030!



Source: Peters et al 2015; Global Carbon Budget 2015

What is the United States doing to cut down Carbon Dioxide Emissions?

U.S., China Reach 'Historic' Deal to Cut Emissions at APEC (Asia-Pacific Economic Cooperation), November 10-12, 2014

Calum MacLeod and Melanie Eversley, USA TODAY 8:54 a.m. EST November 12, 2014

U.S. President Obama smiles as he walks with Chinese President Xi Jinping during a welcome ceremony at the Great Hall of the People in Beijing on Nov. 12, 2014. (Photo: Andy Wong, AP)

- China intends to peak carbon dioxide emissions around 2030, and increase the non-fossil fuel share of all energy to around 20% by 2030. (11% in 2015)
- The United States will double the pace of carbon emission reduction to 26% to 28% of its 2005 level.

http://www.usatoday.com/story/news/world/2014/11/11/china-climate-change-deal/18895661/

(Photo: Matthew Brown, AP)

Clean Power Plan proposed by President Obama in August 2015 aims to reduce carbon dioxide emissions from power plants by nearly 32% from 2005 levels over the next 15 years.

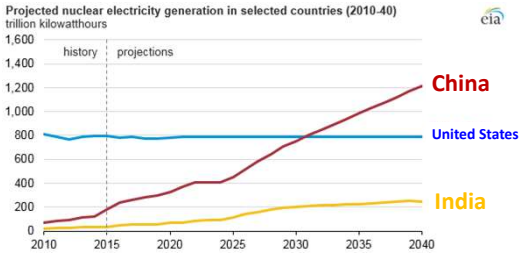
2/9/2016: Supreme Court blocks Obama's Clean Power Plan

The Clean Power Plan is the Obama administration's initial contribution to a historic climate change agreement reached in Paris in December 2015 by 195 nations.

With the Supreme Court's hold in place, the United States may not be holding up its part of the deal.

What is China doing to cut down Carbon Dioxide Emissions?

By 2032, China is expected to surpass the United States as the country with the most electricity generation from nuclear power.



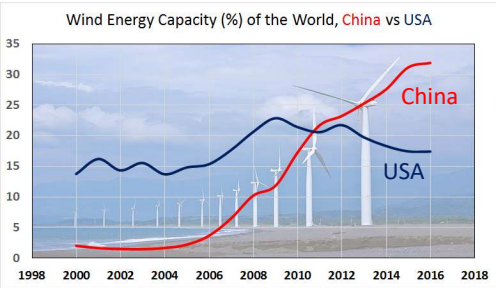
http://www.eia.gov/todayinenergy/detail.cfm?id=28132

Nuclear Plants in China

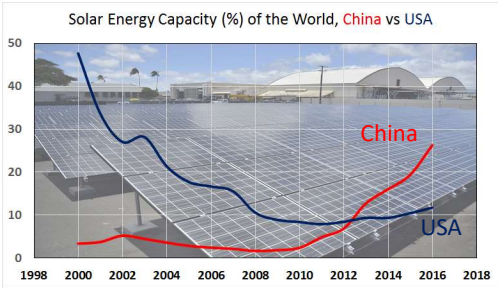
As of 2015, China had 35 operating nuclear reactors, with a total capacity of 27 gigawatts (GW). 10 nuclear reactors were added between 2010 and 2014.

Currently, 20 nuclear reactors are under construction in China.

http://www.world-nuclear.org/information-library/country-profiles/countries-a-f/china-nuclear-power.aspx



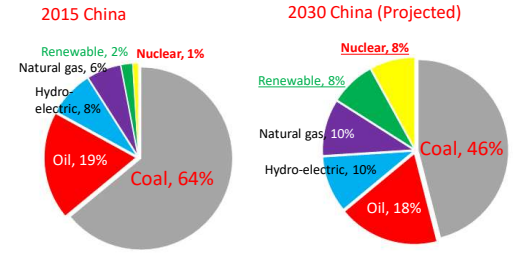
China has one-third of global wind energy capacity in 2016!



China has more than one- quarter of global solar energy capacity in 2016!

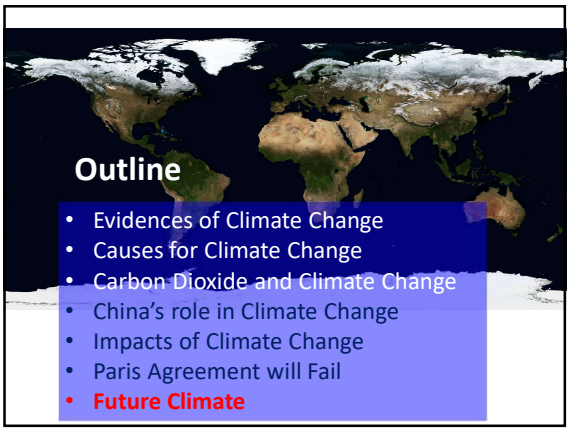
Wind and Solar Energy in China

Comparison of Energy Consumption in China, 2015 vs 2030



Renewable energy: Wind and Solar Energy

Data from BP World Energy Book (2015)


Outline
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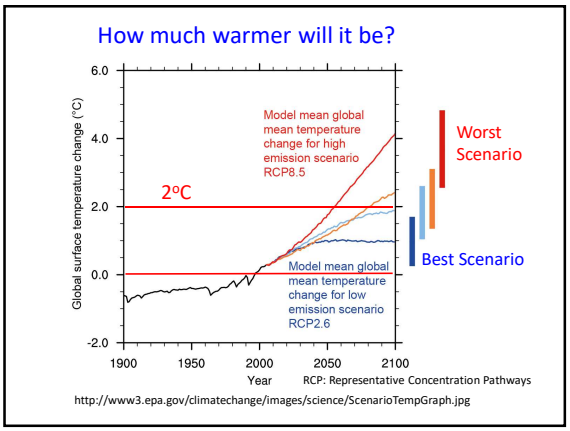
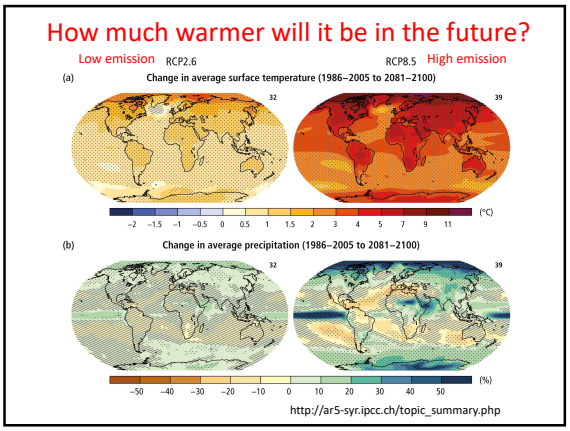
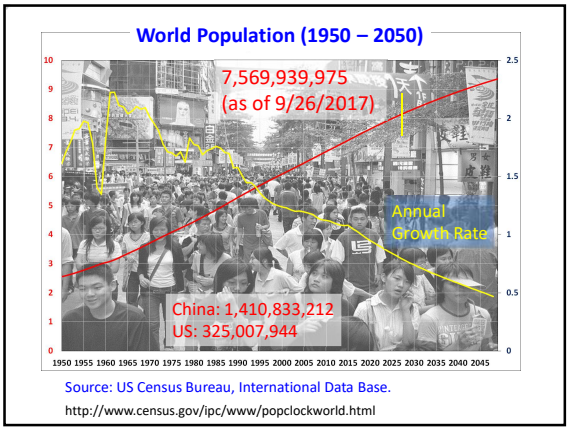

How much warmer will it be?
Global surface temperature change (°C)
6.0
4.0
2.0
0.0
-2.0
1900
1950
2000
2050
2100
Year
2°C
Model mean global mean temperature change for high emission scenario RCP8.5
Model mean global mean temperature change for low emission scenario RCP2.6
Worst Scenario
Best Scenario
RCP: Representative Concentration Pathways
http://www3.epa.gov/climatechange/images/science/ScenarioTempGraph.jpg


How much warmer will it be in the future?
Low emission RCP2.6
RCP8.5 High emission
(a)
Change in average surface temperature (1986–2005 to 2081–2100)
(°C)
(b)
Change in average precipitation (1986–2005 to 2081–2100)
(%)
http://ar5-syr.ipcc.ch/topic_summary.php

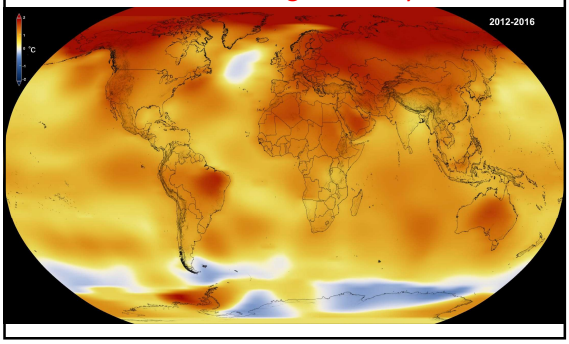

Summary
• One Earth
• Climate Change is happening
• Climate Change is natural and human-made
• Advancing technology helps
• Green energy is expanded but inadequate
• Personal responsibilities are good but limited
• International cooperation is critical
• China plays a significant role in Climate Change


What we can do is to love this Earth as much as we can!


World Population (1950 – 2050)
7,569,939,975
(as of 9/26/2017)
Annual Growth Rate
China: 1,410,833,212
US: 325,007,944
Source: US Census Bureau, International Data Base.
http://www.census.gov/ipc/www/popclockworld.html

How do we Survive with 8.3 billion people on earth in 2030 ?

How many people will die from climate change annually?



How many people will die from climate change annually?

250,000 annually between 2030 and 2050 according to World Health Organization

http://www.who.int/mediacentre/factsheets/fs266/en/

For Comparison:

How many people died in **Tangshan earthquake** in China on July 28, 1976?	400,000
How many people died in **Indian Ocean Tsunami** on December 26, 2004?	280,000
How many people died in **Cyclone Nargis in Myanmar** on May 2, 2008?	138,000
How many people died in **Haiti Earthquake** on January 12, 2010?	160,000
How many people have died in **Syria civil war** conflict since 2011?	400,000 (2016)

How many people died due to **suicide** worldwide in 2016?	800,000
How many people died in **traffic accidents** worldwide in 2013?	1.25 million
How many **children under 5 years old** died worldwide in 2015?	5.9 million
How many people died because of **Tobacco use** worldwide in 2016?	6 million
How many people died from **heart attack** worldwide in 2012?	17.5 million

http://www.who.int/mediacentre/news/releases/2015/child-mortality-report/en/
http://www.who.int/gho/road_safety/en/

Don't we Have Enough Crises to deal with currently?

What do you think?

Expansive and Outrageous International Meetings on Climate Change

Paris 2015, France, 11/30-12/11/2015, **COP 21** of UNFCCC (United Nations Framework Convention on Climate Change)

COP: Conference of Parties

Kyoto Protocol, Japan, December 1997
Bali Road Map, Indonesia, December 2007, COP 13
Copenhagen Conference, December 2009, COP 15
Cancun Agreements, Mexico, December 2010, COP 16,
Durban Outcomes, South Africa, December 2011, COP 17
Doha Climate Gateway, Qatar, December 2012, COP 18
Warsaw Meeting, Poland, November 2013, COP 19
Lima Conference, Peru, December 2014, COP 20
Paris Conference, France, November 2015, COP 21
Marrakesh Conference, Morocco, November 2016, COP 22
Bonn Conference, Germany, November 2017, COP 23

http://unfccc.int/meetings/paris_nov_2015/items/9288.php
http://www.cop21.gouv.fr/en/cop21-cmp11/what-cop21-cmp11

How much did it cost for COP 21 in Paris, France in December 2015?

- Lodging: **36,000** people x 11 nights x US $1000 = $396 million
- Food: 40,000 x 11 days x $500 = $220 million
- Flights: 40,000 x $2000 = $80 million
- Limousines: 40,000 x 11 x $800 = $352 million
- Entertainment: 40,000 x 11 x $1000 x 10% = $44 million

HIGH TOTAL: 1,102 million US dollars

- Lodging: **36,000** people x 11 nights x US $500 = $198 million
- Food: 40,000 x 11 days x $500 = $220 million
- Flights: 40,000 x $2000 = $80 million
- Limousines: 40,000 x 11 x $200 = $88 million
- Entertainment: 40,000 x 11 x $1000 x 10% = $44 million

LOW TOTAL: 630 million US dollars

http://wattsupwiththat.com/2015/11/01/will-paris-cop21-cost-more-to-host-than-it-raises-in-green-pledges/
https://www.carbonbrief.org/analysis-which-countries-have-sent-the-most-delegates-to-cop21

What do you think?

How many more international meetings do we really need for understanding and dealing with issues of climate change?

2016 IPCC International Meetings

http://www.ipcc.ch/scripts/_calendar_template.php?wg=8

Date	Description and Venue
25 Jan - 28 Jan	TFI - Expert Meeting to collect EFDB and Software users feedback *(Kobe, Japan)*
26 Jan - 27 Jan	TGICA Expert Meeting *(Geneva, Switzerland)*
9 Feb - 10 Feb	IPCC Expert Meeting on Communication *(Oslo, Norway)*
16 Feb - 17 Feb	**51st Session of the IPCC Bureau** *(WMO, Geneva, Switzerland)*
11 Apr - 13 Apr	**43rd Session of the IPCC** *(Nairobi, Kenya)*
14 Apr - 14 Apr	**Executive Committee Meeting** *(Nairobi, Kenya)*
25 Apr - 26 Apr	TFI - Expert meeting for Technical Assessment of IPCC Inventory Guidelines follow-up on specified issue from the 2015 expert meetings *(Wollongong, Australia)*
27 Apr - 29 Apr	TFI - Expert Meeting for Technical Assessment of IPCC Inventory Guidelines-Cross-sectoral issues *(Wollongong, Australia)*
6 Jul - 8 Jul	TGICA-24 *(Helsinki, Finland)*

50 IPCC members

2016 IPCC International Meetings

Date	Description and Venue
15 Aug - 18 Aug	**Scoping Meeting Special Report on 1.5°** *(Geneva, Switzerland)*
18 Aug - 19 Aug	**52nd Session of the IPCC Bureau** *(Geneva, Switzerland)*
29 Aug - 31 Aug	Future Earth/IPCC/PROVIA Workshop on Lessons Learnt and Gaps in Knowledge in WGI/WGII/WGIII AR5 *(Stockholm, Sweden)*
29 Aug - 31 Aug	TFI - Scoping Meeting for Methodology Reports *(Minsk, Belarus)*
1 Sep - 2 Sep	**TFI - 28th Session of the Task Force Bureau** *(Minsk, Belarus)*
3 Oct - 30 Oct	Call for Scoping Nominations for AR6
17 Oct - 20 Oct	**44th Session of the IPCC** *(Bangkok, Thailand)*
21 Oct - 21 Oct	**Executive Committee Meeting** *(Bangkok, Thailand)*
6 Dec - 9 Dec	Scoping of the IPCC Special Report on "Climate change and oceans and the cryosphere" *(Monaco)*
12 Dec - 15 Dec	TFI - 14th Editorial Board Meetings *(Bali, Indonesia)*
13 Dec - 14 Dec	TFI - 13th & 14th Meetings on Data for the EFDB *(Bali, Indonesia)*

COP 22: November 7 – 18, 2016 Marrakech, Morocco

2017 IPCC International Meetings

https://www.ipcc.ch/scripts/_calendar_template.php?wg=8

Date	Description and Venue
23 Jan - 29 Jan	Decision on Scoping Nominations (AR6)
13 Feb - 16 Feb	WG I/II/III - Scoping of the "Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems" (organized by WGIII) *(Dublin, Ireland)*
6 Mar - 10 Mar	WG I/II/III - Special Report on 1.5°C First Lead Author Meeting (organized by WGI) *(Sao Jose Dos Campos, Brazil)*
14 Mar - 17 Mar	TFI - "Use of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories - IPCC Expert Meeting to collect EFDB and Software users' feedback" *(Kitakyushu, Japan)*
26 Mar - 27 Mar	**53rd Session of the IPCC Bureau** (March 26-27 a.m.) *(Guadalajara, Mexico)*
28 Mar - 31 Mar	**45th Session of the IPCC** *(Guadalajara, Mexico)*
26 Apr - 28 Apr	WG III - Expert Meeting on Mitigation, Sustainability and Climate Stabilisation Scenarios *(Addis Ababa, Ethiopia)*
1 May - 5 May	**AR6 Scoping Meeting** *(Addis Ababa, Ethiopia)*
5 Jun - 11 Jun	WG I/II/III - Second Lead Author Meeting for the SR15 (organized by WG I) *(Exeter, UK)*
7 Jun - 14 Jun	TFI - Methodology Report: First Lead Author Meeting for the Elaboration of the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, 1-a (Energy, IPPU, Waste) / 1-b (Agriculture, Forestry and Other Land Use - AFOLU) / 1-c (General Guidance and Reporting - GGR) *(Bilbao, Spain)*

2017 IPCC International Meetings

Date	Description and Venue
5 Sep - 5 Sep	**54th Session of the IPCC Bureau** *(Montreal, Canada)*
6 Sep - 10 Sep	**46th Session of the IPCC** *(Montreal, Canada)*
11 Sep - 22 Oct	Call for CLA/LA/RE Nominations (AR6)
24 Sep - 24 Sep	TFI - Second Lead Author Meeting for the Elaboration of the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Coordinating Lead Author Meeting *(Victoria Falls, Zimbabwe)*
25 Sep - 28 Sep	TFI - Second Lead Author Meeting for the Elaboration of the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories *(Victoria Falls, Zimbabwe)*
29 Sep - 29 Sep	TFI - Twenty-Ninth Meeting of the Bureau of the IPCC Task Force on National Greenhouse Gas Inventories *(Victoria Falls, Zimbabwe)*
2 Oct - 6 Oct	WG I/II - First Lead Author Meeting for Special Report on the Ocean and Cryosphere in a Changing Climate (organized by WGII) *(Nadi, Fiji)*
16 Oct - 20 Oct	WG I/II/III - First Lead Author Meeting on Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. (organized by WG III) *(Oslo, Norway)*
23 Oct - 29 Oct	WG I/II/III - Third Lead Author Meeting on SR15 (organized by WG I) *(Malmo, Sweden)*
12 Dec - 15 Dec	TFI - 15th Meeting of the IPCC Emission Factor Database (EFDB) Editorial Board *(Paris, France)*
13 Dec - 14 Dec	TFI - 15th Expert Meeting on Data for the IPCC Emission Factor Database (EFDB) (Joint IPCC/IEA Expert Meeting on Data: Energy data collection, energy statistics and data for the IPCC EFDB) *(Paris, France)*

COP 23: November 6 – 17, 2017, Bonn, Germany

Why are we still talking about (future) impacts of climate change when there are many crises occurring around the world right now?

Why do they talk about climate change?

Because it is

- In the future
- What they have
- Their privileges
- Their job security
- Safe to talk about climate change
- Easy to talk about climate change


What we can do is to love this Earth
as much as we can!