

# International Insurance Conference 2017 in Karachi Climate Change & Emerging Risks

Organized by

Pakistan Insurance Institute

09<sup>th</sup> to 11<sup>th</sup> April 2017

## **Global Warming and the Changing Insurance Landscape**

**Presenter : Dr Jagath Alwis BSc., FIII, FCII (Lon), FloD (UK)**

**Director (Technical)/Chief Technical Officer**

**CEYLINCO GENERAL INSURANCE LTD**

**Sri Lanka**

# AGENDA

- **Climate change**
- **Green House effect**
- **Global Warming**
- **Impact on Global Warming**
- **Worldwide Weather related Natural Catastrophes**
- **Impact on the Asian Region**
- **Possible impact to the Insurance Industry**
- **Proposed Suggestions**

# Climate Change

- No subject was discussed than “Climate Change” during the last couple of decades
- Much scientific research was done and continuing
- Discussed among Scientists, Researchers, NGOs, Politicians, World Leaders and General Public
- Former British Prime Minister Margaret Thatcher was the first leader who openly spoke about climate change in her speech to the Royal society in 1989
- Followed by drought in the USA and Canada in 1988/89 and the Hurricane Katarina much public awareness was created about climate change
- The focus was on the Green House effect

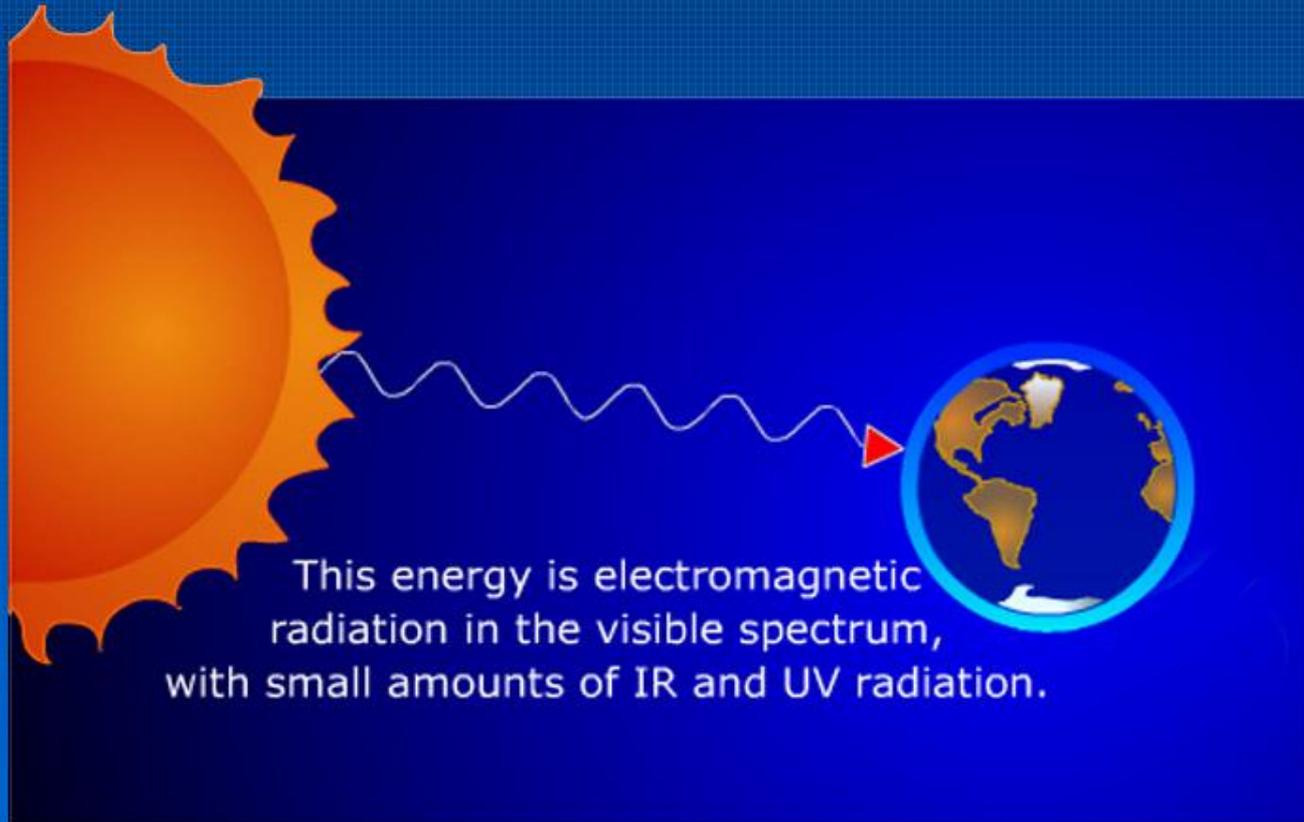
# GREEN HOUSE EFFECT



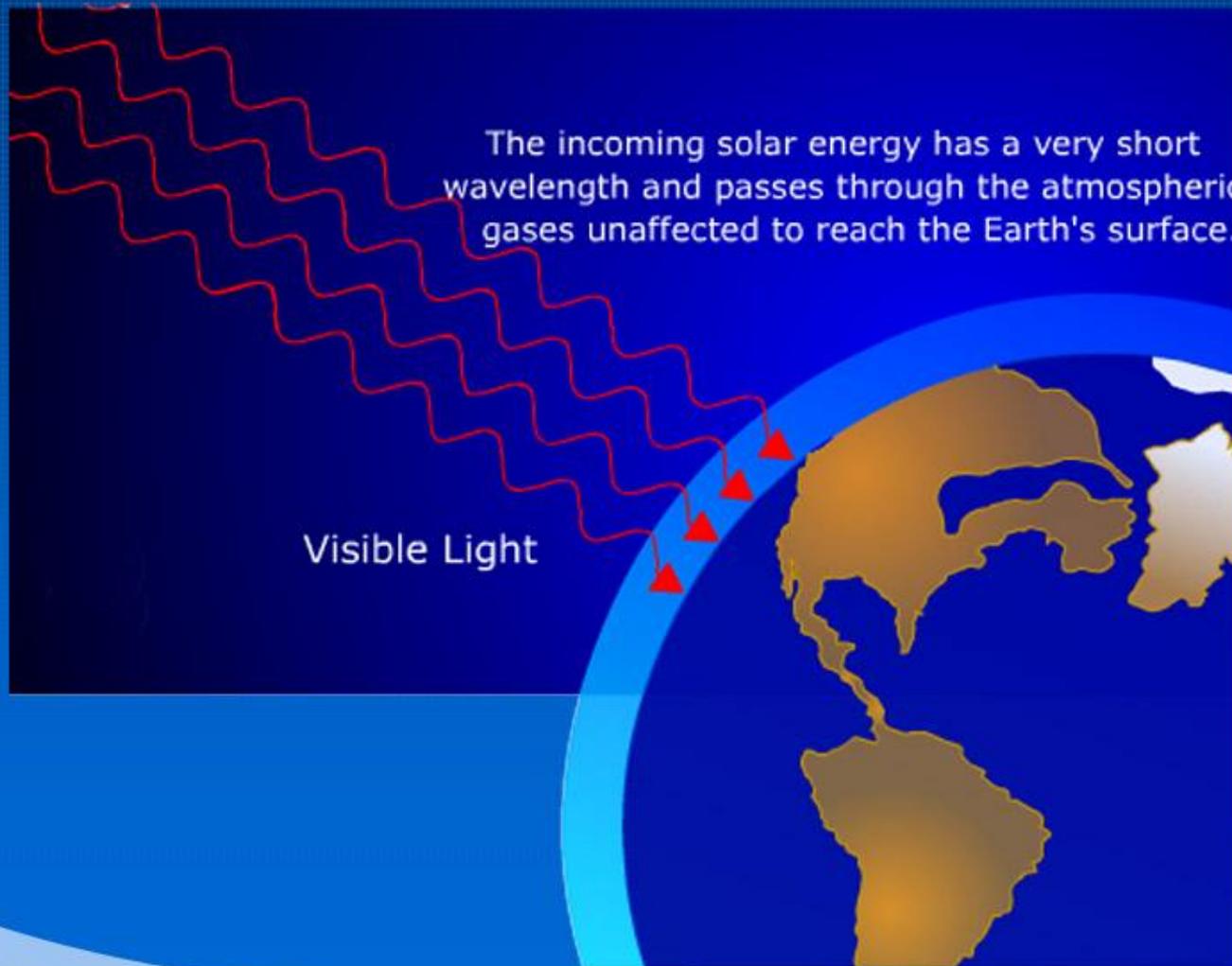
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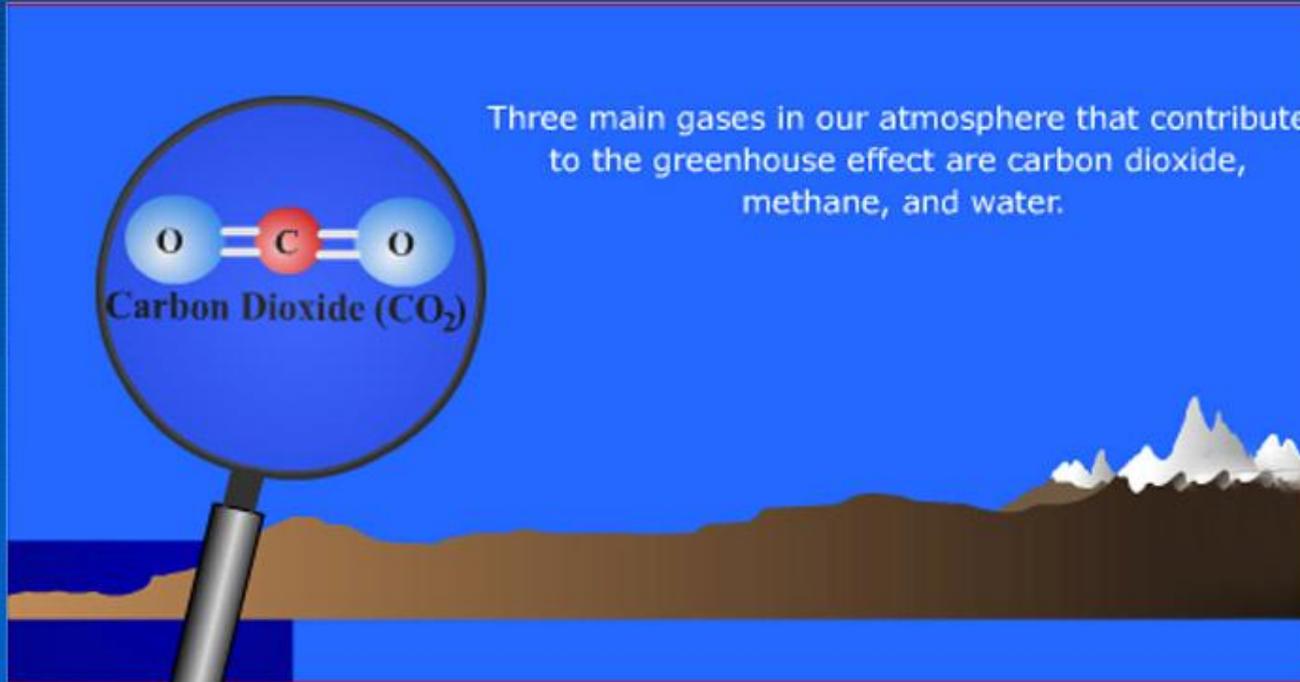
# GREEN HOUSE EFFECT

The Earth's surface absorbs the solar energy and releases it back to the atmosphere as infrared (IR) radiation, some of which goes back into space.

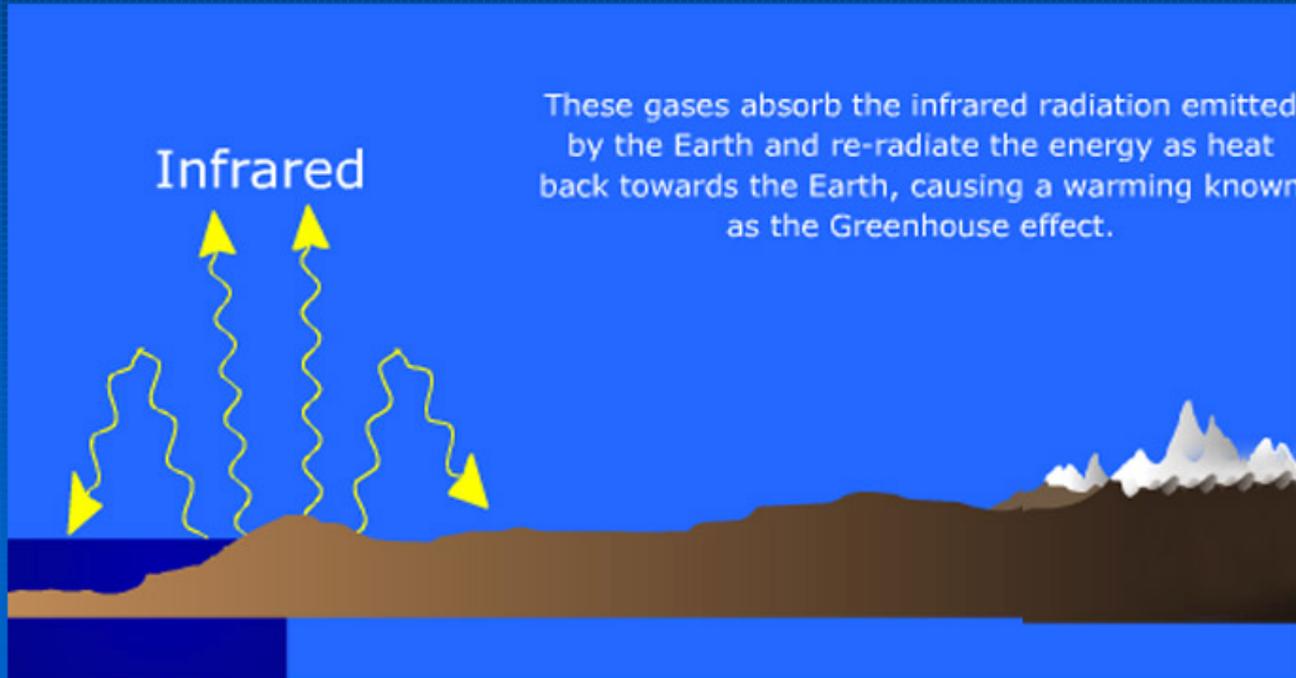
IR radiation  
(heat)



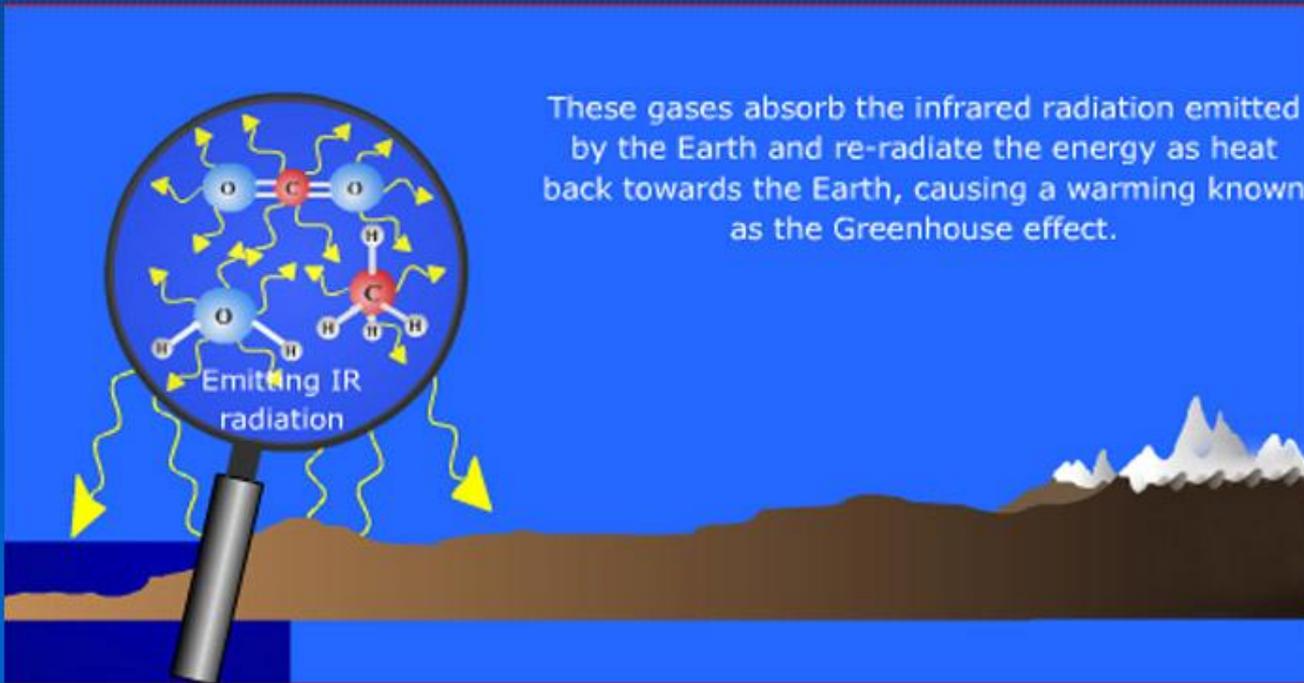
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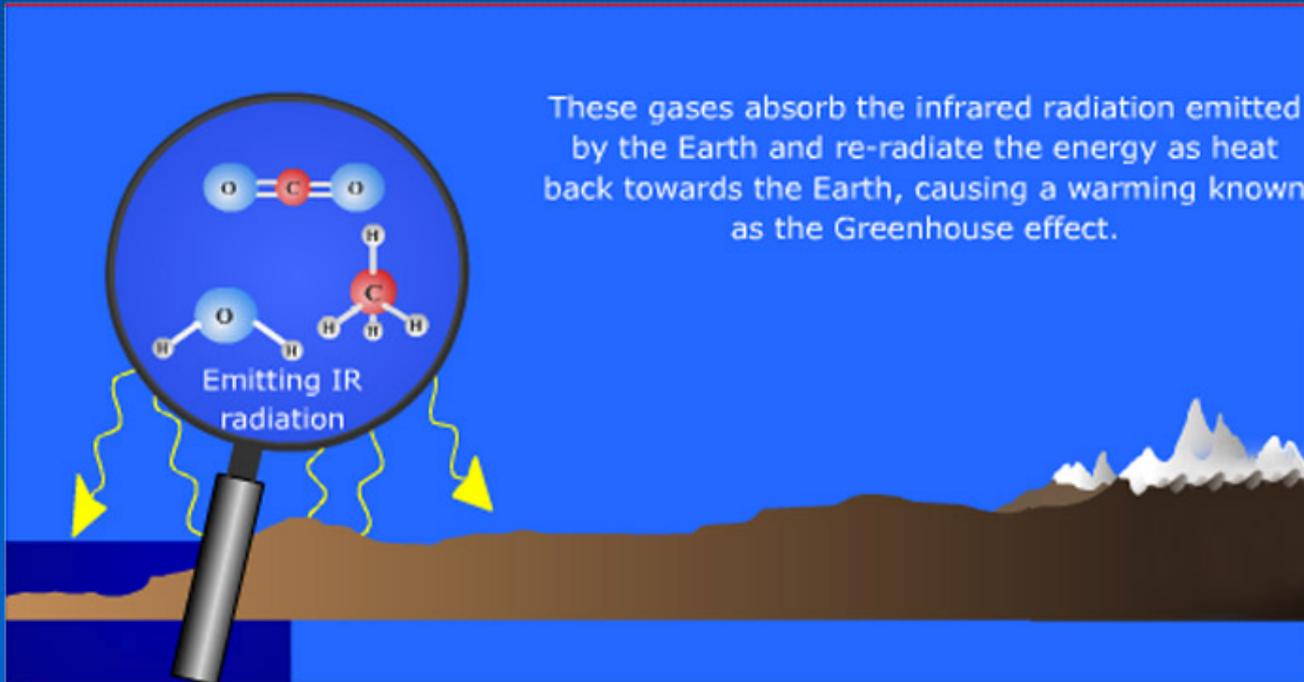
# GREEN HOUSE EFFECT



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# GREEN HOUSE EFFECT

This has caused a dangerous global warming process that is threatening our current environment by melting polar ice caps and raising sea levels around the globe.

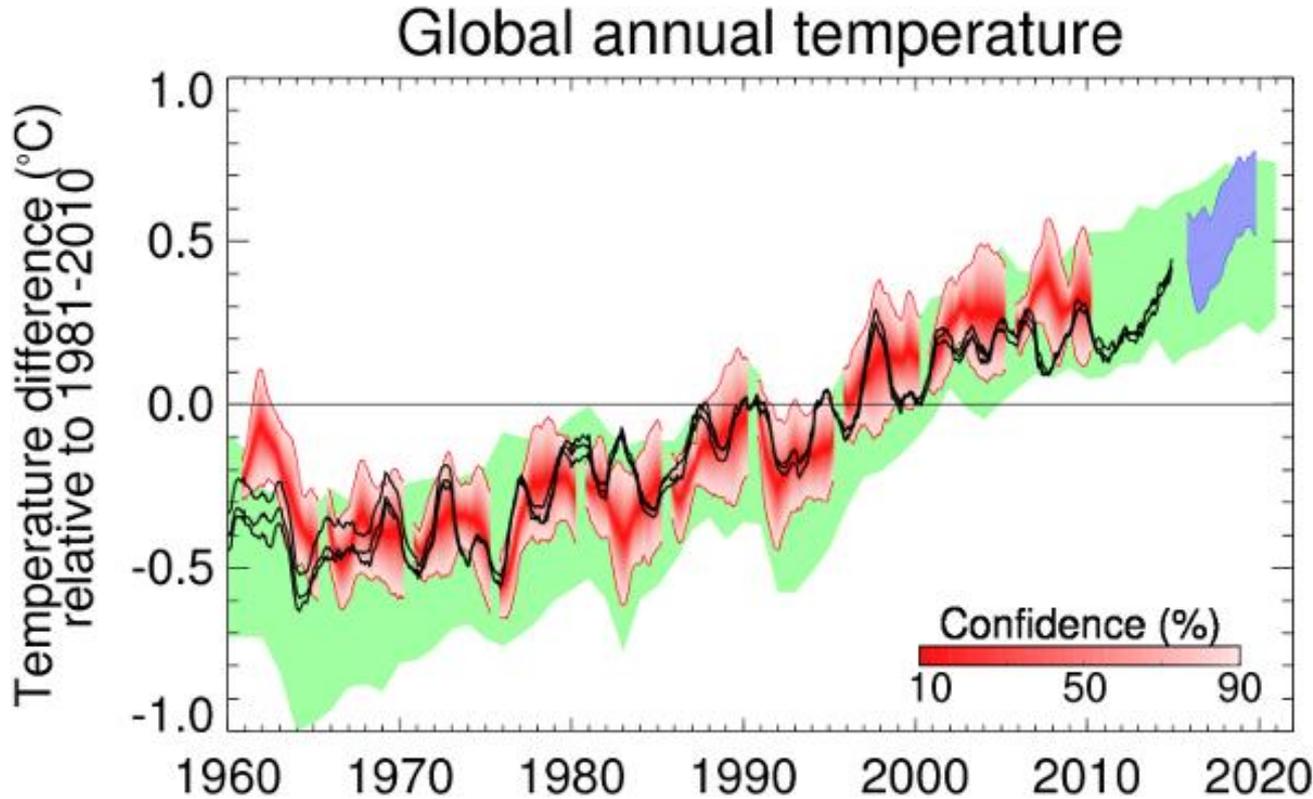


# GLOBAL WARMING

- The green house effect is a natural process that maintains the Earth's temperature at a level hospitable to life
- The cyclic process absorption – emission – absorption serves to maintain the heat near the surface
- In the absence of the green house effect, the Earth's average temperature of 14 °C would be around -18 °C
- Mars has an average temperature of - 32.7 °C as its thin atmosphere supports virtually no green house effect
- But the world is un-doubtly warming and it has been projected that by 2100 the temperature will increase by 3.5 °C due to enhanced greenhouse effect.

# GLOBAL WARMING

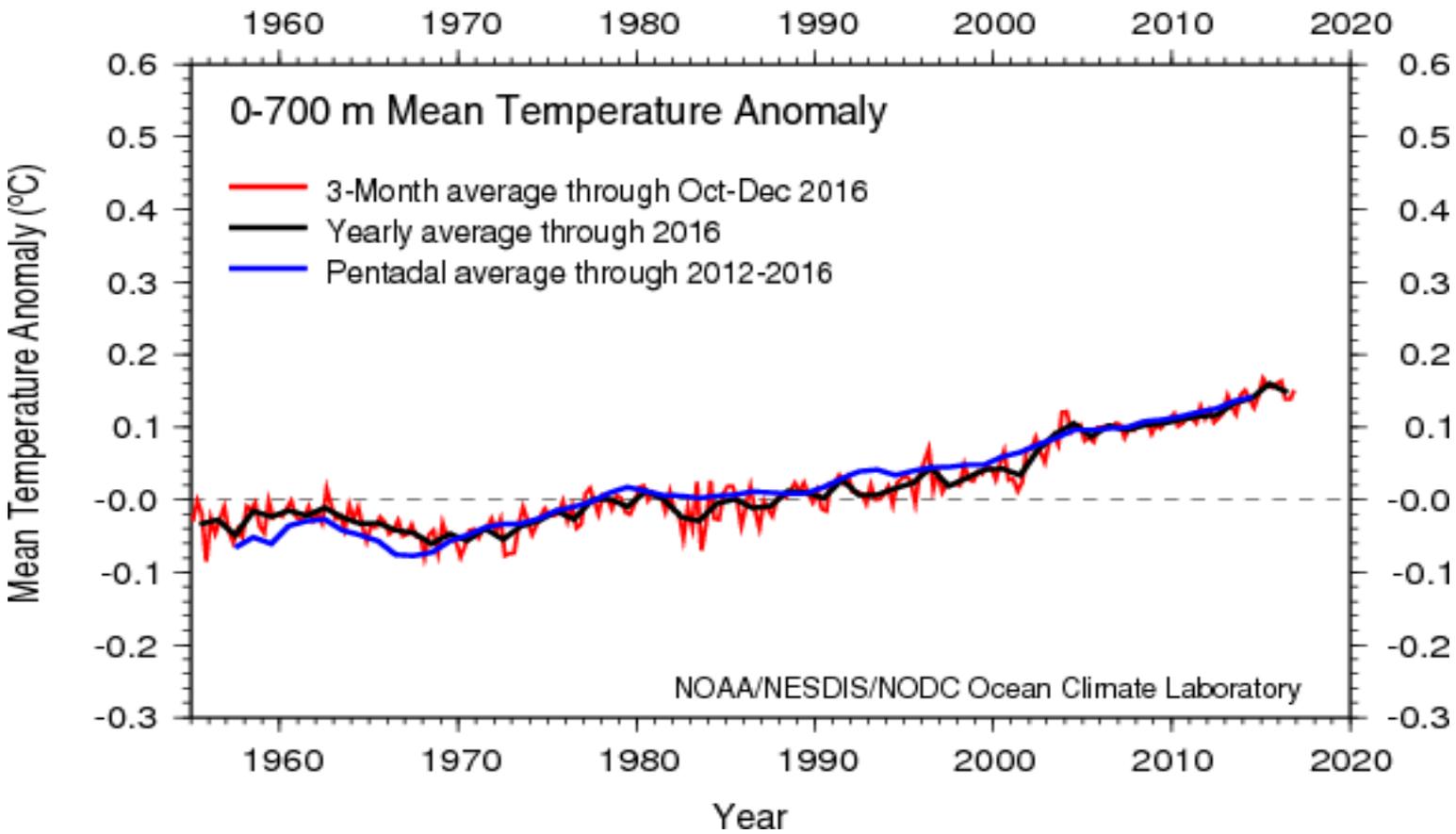
## Global Surface Temperature Trends 1960 - 2016



Source : <https://wattsupwiththat.com>

# GLOBAL WARMING

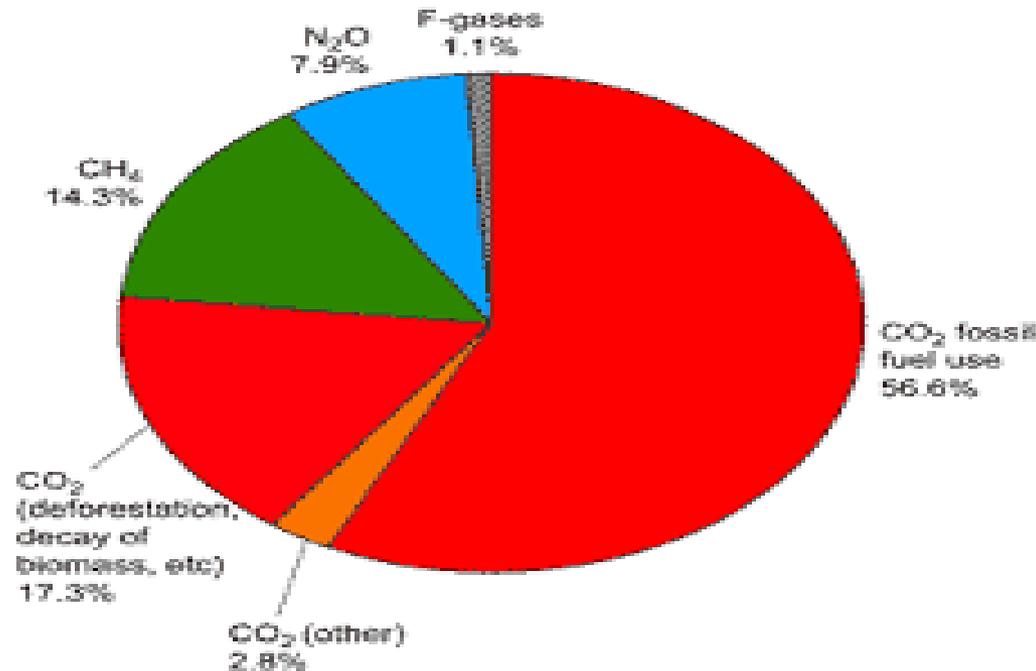
## Trends in Ocean Heat Penetration 1960-2016



Source :<https://fabiusmaximus.com/sitemap.xml>

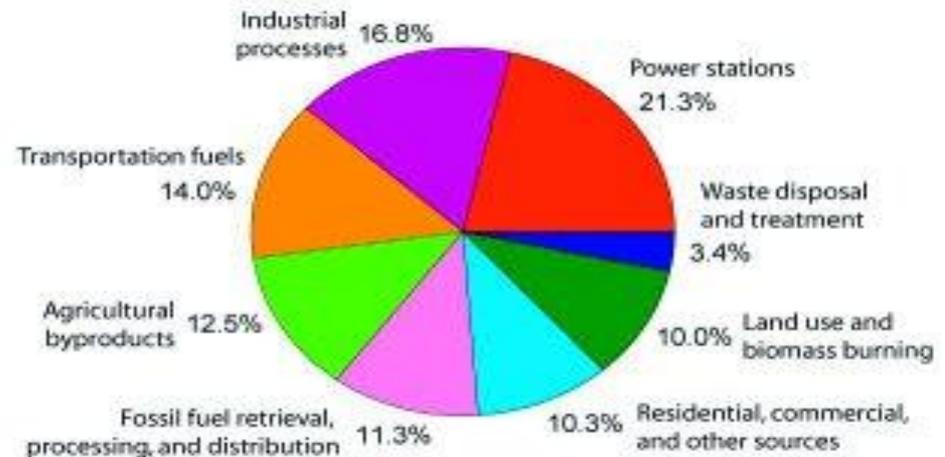
# GLOBAL WARMING

- Drastic Increase of greenhouse gases such as Carbon dioxide, Methane, Nitrous Oxide, Water vapors in the atmosphere, absorb infrared radiation emitted by the Earth and re-radiate the energy as heat back towards the Earth
- It is noticed that the level of Carbon dioxide in the atmosphere is increasing over the years and accelerated since the industrial revolution in 1767



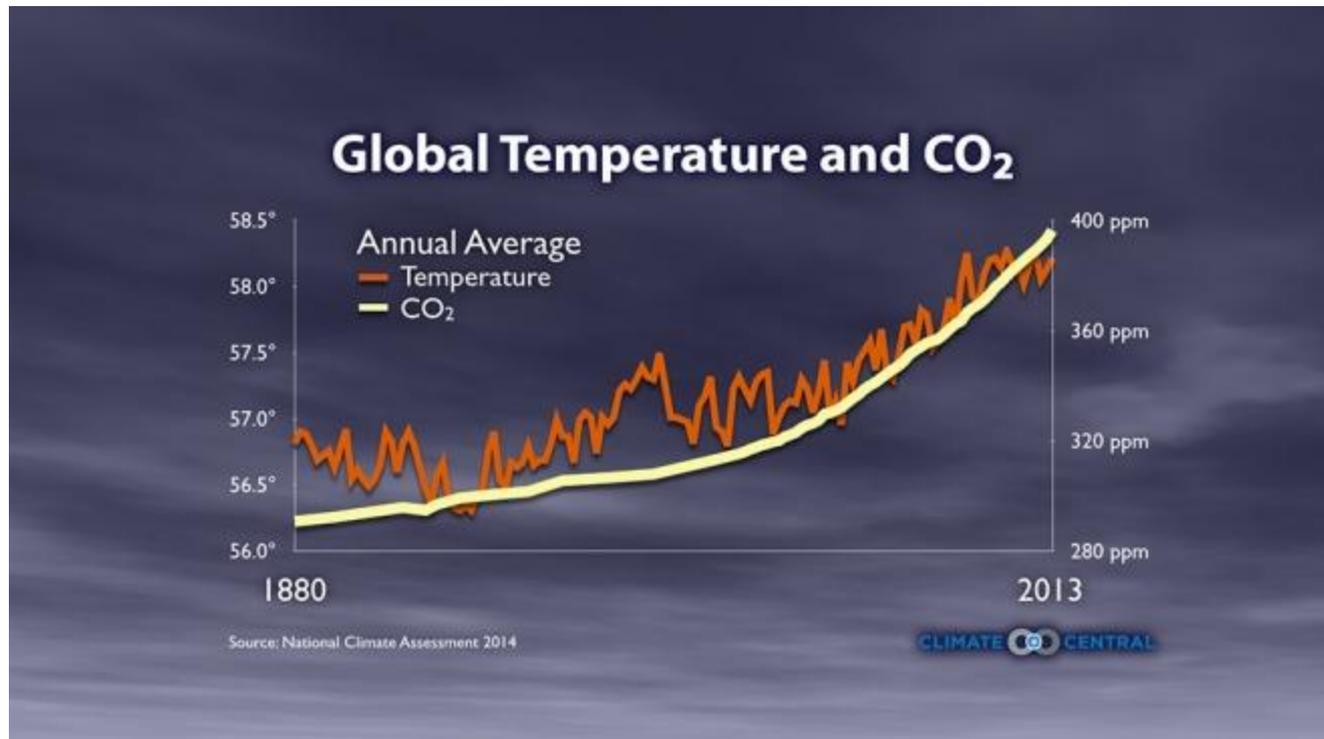
# GLOBAL WARMING

- During the recent past, the CO<sub>2</sub> level is increasing due to ;
  - Burning Natural Gases, Coal and Oil
  - Certain Farming practices
  - Change of land usage
  - Deforestation
  - Pollution by vehicles
  - Pollution by factories



# GLOBAL WARMING

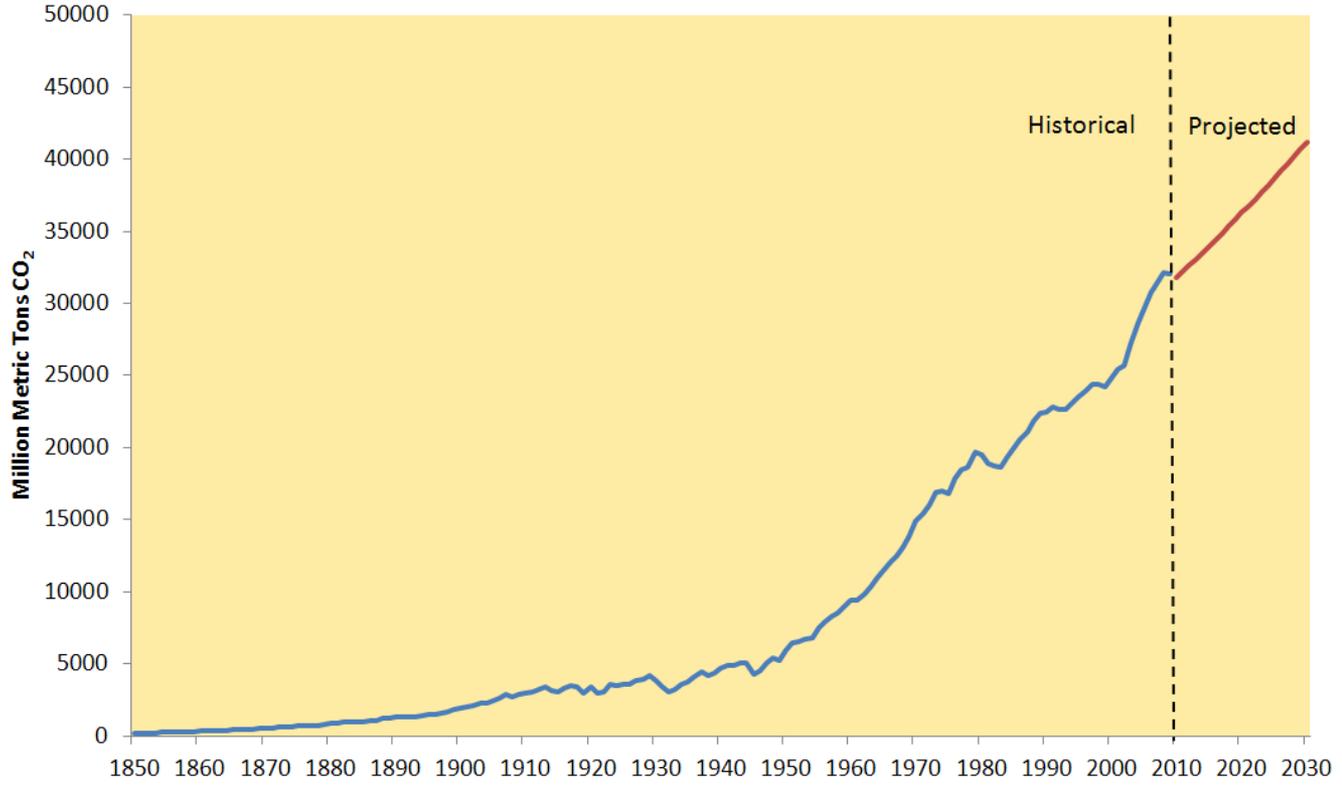
## Atmospheric Carbon Dioxide & Global Surface Temperature Trends 1880 - 2013



# GLOBAL WARMING

## Historical Global CO2 Emissions 1850 – 2030

Global Carbon Dioxide Emissions 1850-2030



Source: Atlas Forum

# COUNTRIES RANKING WITH THE HIGHEST CARBON DIOXIDE EMISSION

<b>2015 Total Emissions Country Rank</b>	<b>Country</b>	<b>2015 Total Carbon Dioxide Emissions from the Consumption of Energy (Million Metric Tons)</b>	<b>2015 Per Capita Carbon Dioxide Emissions from the Consumption of Energy (Metric Tons of Carbon Dioxide per Person)</b>
1.	China	10,641,789	7.7
2.	United States	5,172,338	16.1
3.	European Union	3,469,671	6.9
4.	India	2,454,968	1.9
5.	Russia	1,760,895	12.3
6.	Japan	1,252,890	9.9
7.	Germany	777,905	9.6
8.	Inter. Shipping	642,024	-
9.	Iran	633,750	8.0
10.	South Korea	617,285	12.3
11.	Canada	555,401	15.5
12.	Saudi Arabia	505,565	16.0
13.	Indonesia	502,961	2.0
14.	Inter. Aviation	502,936	-
15.	Brazil	486,2291	2.3
16.	Mexico	472,018	3.7
17.	Australia	446,348	18.6
18.	South Africa	417,161	7.7
19.	United Kingdom	398,524	6.2

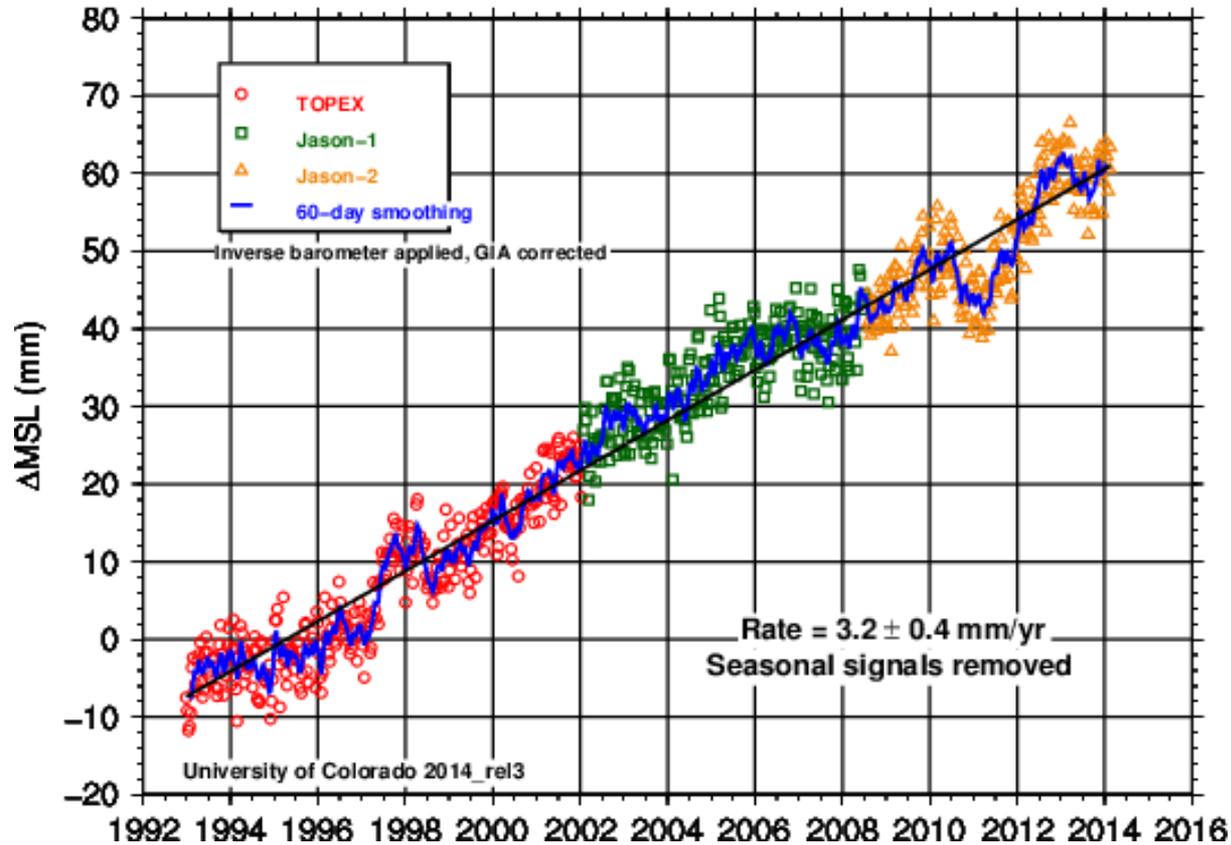
Source: Energy Information Agency – Department of Energy USA

# IMPACT OF GLOBAL WARMING

- **Melting of Ice in the north pole**
- **Sea level will rise and it is estimated that it may increase by 50 cm by the year 2100**
- **South Pacific Islands could be swamped by rising sea levels and storm surges**
- **Millions of people living in low lying coastal areas could be displaced by rising sea levels**
- **Glaciers are melting creating flash floods**
- **Increasing number of tropical storms, hurricanes, tornados etc.,**
- **Unusual climatic conditions could create various other natural catastrophes**
- **Conditions favorable to spread various diseases will increase health risks**

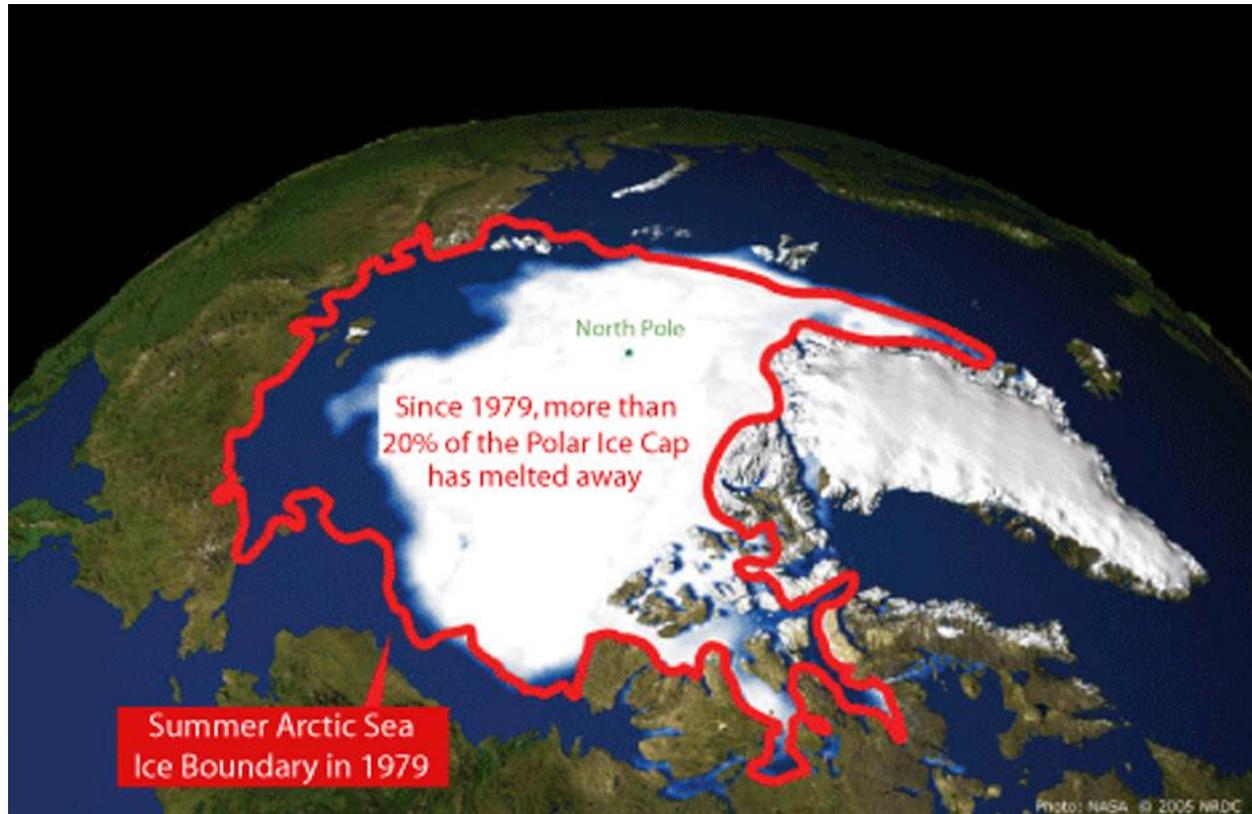
# GLOBAL WARMING

## Mean Sea Level Rise

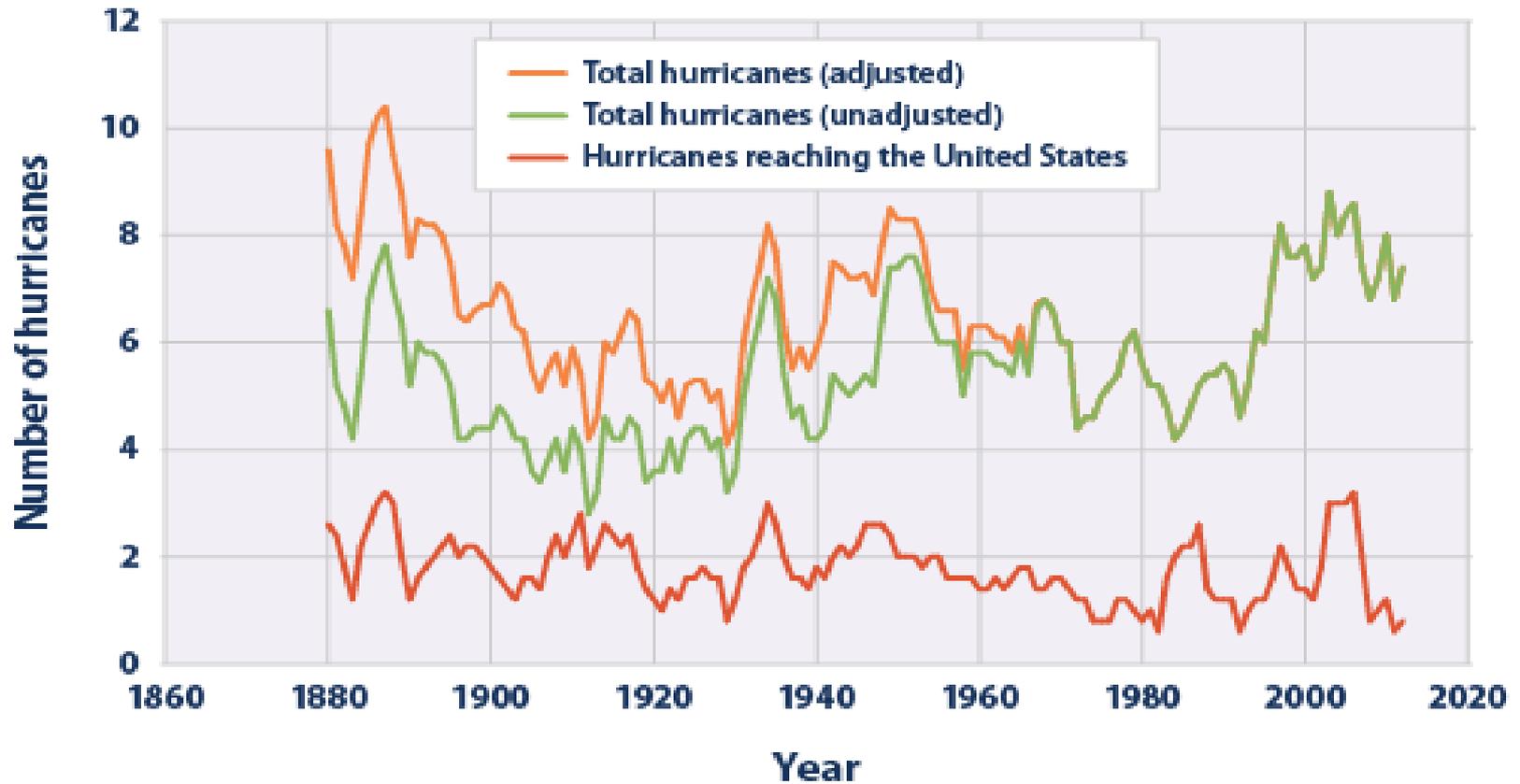


# GLOBAL WARMING

## Summer Arctic Sea Ice Decline



# Number of Hurricanes in North Atlantic, 1878 -2014



US Environment protection agency

# Details of Tropical Storms in USA for the last 10 years

Year	Storms	Hurricanes	Deaths	Damage (millions USD)
<b>2015</b>	12	4	89	>590
<b>2014</b>	6	6	17	232
<b><u>2013</u></b>	13	2	47	1,510
<b><u>2012</u></b>	19	10	199	75,000+
<b><u>2011</u></b>	19	7	100	21,000
<b><u>2010</u></b>	21	12	287	12,356
<b><u>2009</u></b>	11	3	6	77
<b><u>2008</u></b>	16	8	761	24,945
<b><u>2007</u></b>	15	6	341	50
<b><u>2006</u></b>	10	5	5	500

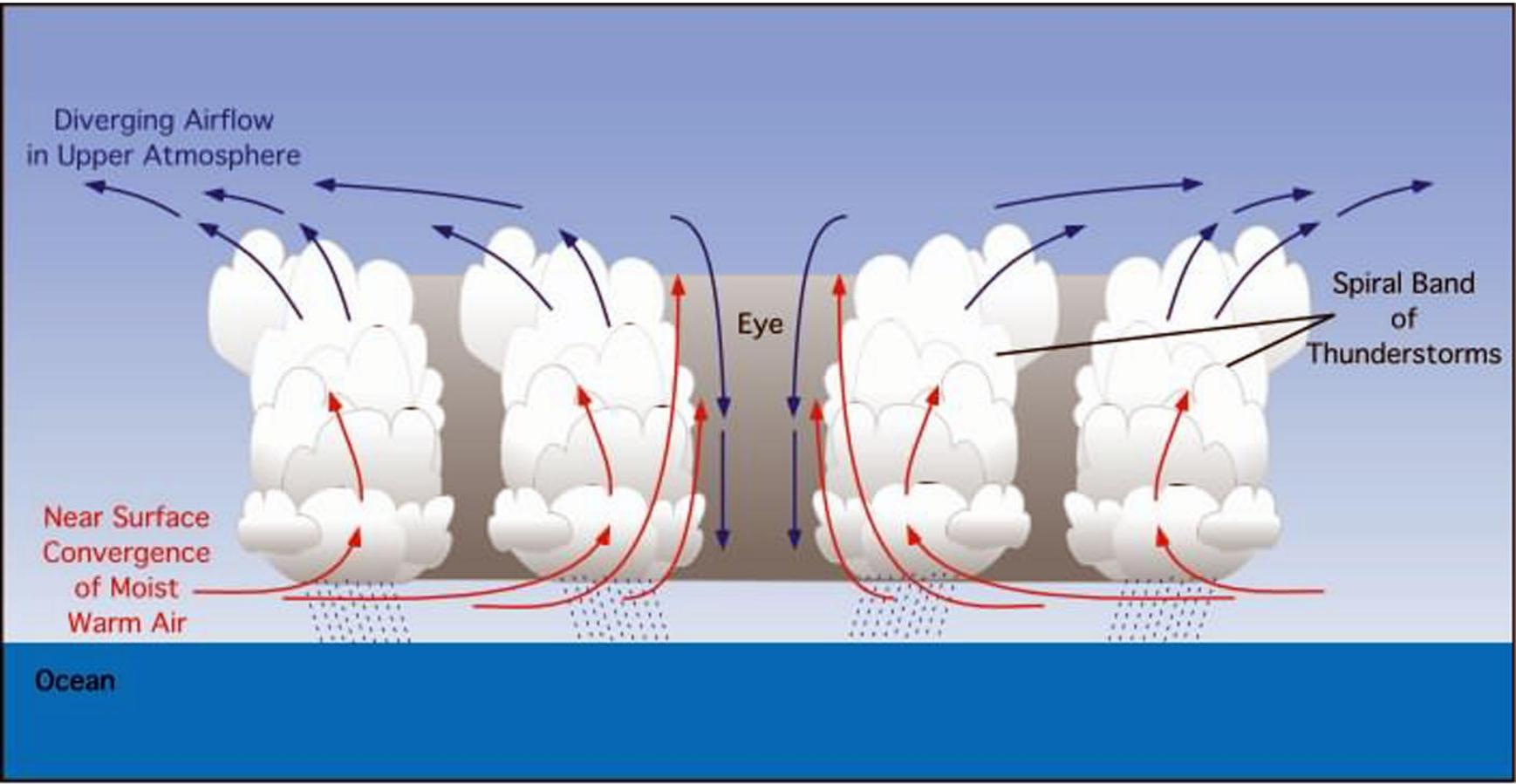
# IMPACT OF GLOBAL WARMING

- Increase in Tropical storms and hurricanes
- Hurricane is an intense tropical storm formed over warm tropical oceans during a period when the sea surface temperature is above 26.5 °C
- Under these circumstances, evaporation from the ocean surface generates very high humidity in the atmosphere, which in turn generates thunder storms
- A tropical storm is when a system of powerful thunderstorms converges and begins to rotate in the atmosphere, forming a vortex known as a tropical depression
- Heat from the ocean surface is drawn up through the center of the vortex and released to the atmosphere as water vapor condenses to form rain around the perimeter of the vortex

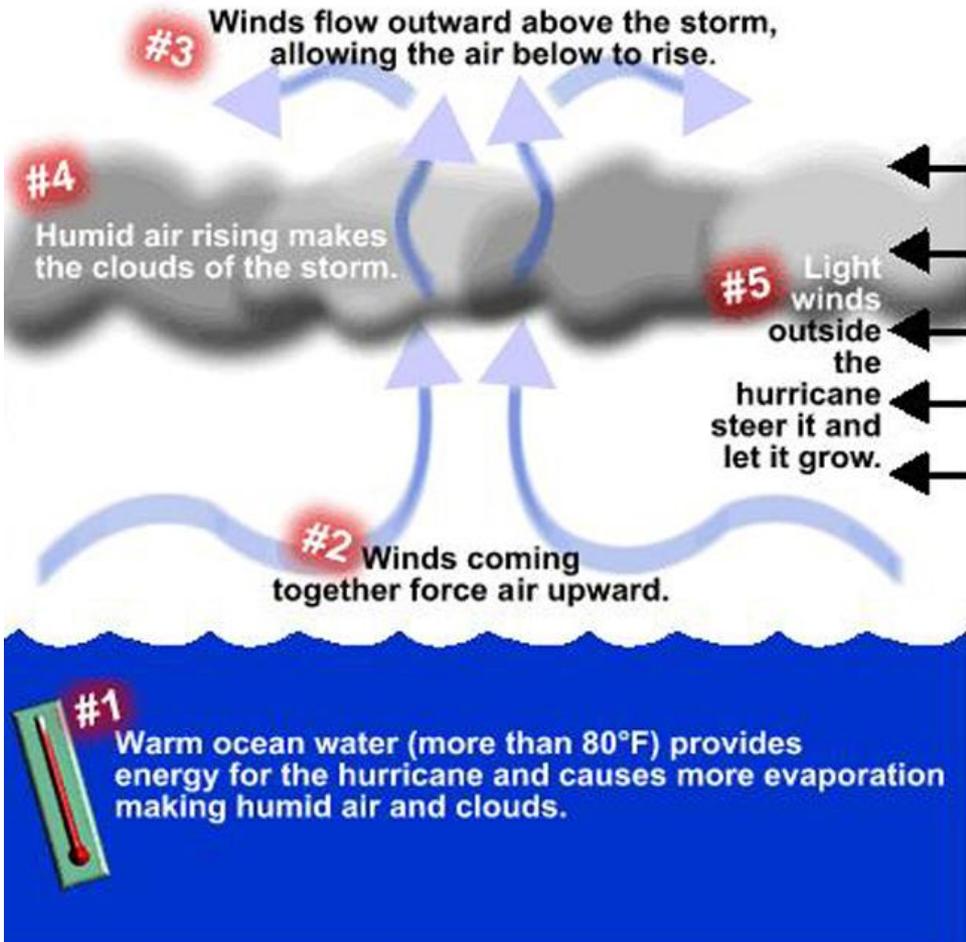
# IMPACT OF GLOBAL WARMING

- **water vapor condenses to form rain around the perimeter of the vortex**
- **Energy from the ocean heat also generates high winds**
- **More the heat on the surface water, more the potential to generate heavy rain & high winds**
- **If the wind speed of a tropical storm exceeds 35 mph, a name will be assigned**
- **Since 1996 tropical storms frequency has increased by 40% and the Research has revealed that there is a positive co-relation between sea surface temperature and the frequency of hurricanes**

# IMPACT OF GLOBAL WARMING



# IMPACT OF GLOBAL WARMING



## The 10 most expensive Natural Catastrophes for the global insurers 1970- 2015 (in US\$ Mn)

Year	Region	Event	Overall loss	Insured loss
2005	US, Mexico	Hurricane Katrina	125.0	79,663
2011	Japan	Earthquake, tsunami	210.0	36,865
2012	US, Canada	Hurricane Sandy	68.5	36,115
1992	US, Bahamas	Hurricane Andrew	26.5	27,017
1994	US	Northridge earthquake	44.0	24,455
2008	US, Mexico	Hurricane Ike	38.0	22,343
2011	New Zealand	Earthquake, aftershocks	24.0	16,853
2004	US, Venezuela	Hurricane Ivan	23.0	16,180
2011	Thailand	Monsoon rains, floods	43.0	15,799
2005	USA, Mexico	Hurricane Wilma	22.0	12,500

Source : Swiss Re, Sigma 1/2016 ([FAQ](#))

# The 10 most costly global weather related Insurance losses in 2016

Insured Loss (in US\$ )	Victims	Date (start)	Event	Country
5.5 B	154	14 Apr.	Earthquake	Japan
5.0 B	605	28 <sup>th</sup> Sep. to 10 <sup>th</sup> Oct	HU Matthew (hurricane)	US, Caribbean
3.4 B	20	May/June	Floods, severe Cyclone, Storms	Western/Central Europe
3.0 B	13	August	Floods	United States
2.8 B	-	May	Wildfire	Canada
750 M	475	Summer	Floods	China
750 M	-	Yearlong	Drought	India
200 M	-	Yearlong	Drought	China
200 M	289	July	Floods	China
100 M	299	24 <sup>th</sup> August	Earthquake	Italy

# Climate Risk Index for 2015 : The most affected countries

Ranking 2015 (2014)	Country	CRI score	Death toll	Deaths per 100,000 inhabitants	Absolute losses (in million US\$ )	Losses per unit GDP in %	Human Development Index
1 (23)	Mozambique	12.17	351	1.235	500.07	1.499	180
2(138)	Dominica	13.00	31	43.66	611.22	77.369	94
3(60)	Malawi	13.83	111	0.61	907.98	4.451	173
4(10)	India	15.33	4317	0.33	40077.22	0.501	130
5 (29)	Vanuatu	20.33	11	4.09	278.86	40.650	134
6(94)	Myanmar	20.83	173	0.33	1359.65	0.479	148
7(138)	Bahamas	22.83	33	9.07	80.64	0.904	55
8(118)	Ghana	23.33	267	0.99	306.28	0.265	140
8(34)	Madagascar	23.33	118	0.49	228.04	0.642	154
10(62)	Chile	25.17	39	0.22	2652.69	0.627	42

**Source: Germanwatch**

# Natural Catastrophes in Asia in 2015

Month	Country	Event	No of victims / amount of damage
April	Nepal, India, China, Bangladesh	Earthquake	8960 dead, US\$ 160
May	India	Heatwave	2248 dead,
June	Pakistan	Heatwave	1270 dead
June	China	Cruise ship hit by strong winds capsizes on Yangtze River	442 dead
October	Afghanistan, Pakistan, India, Guatemala	Earthquake	399 dead
February	Afghanistan	Avalanches, landslides, floods, heavy snowfall	291 dead
November	India	Severe flash floods in Chennai	289 dead, US\$ 755
July	India	Monsoon, floods	206 dead,

Sauce: Swiss Re Economics Research & Consulting

# Possible Impact to the Insurance Industry

- **Impact on the net account will result in allocating more capital for affected classes specially when “Risk Based Capital” is inforced**
- **Impact on the Reinsurance Treaties - Stage 1**
  - **Additional statistics Eg., NatCat premium against claims**
  - **Area-wise accumulation**
  - **Impact on Commissions - Sliding scale commission**
  - **No Profit Commissions on NatCat premium**
  - **Minimum rates for NatCat**
  - **Minimum deductibles for NatCat**
  - **Restricted wordings for NatCat**

# Possible Impact to the Insurance Industry

- Impact on the Reinsurance Treaties - Stage 2
  - Event limits for NatCat under proportional treaties which will result in purchasing additional XL covers
  - Loss Participation Clause
- Impact on Reinsurance Treaties - Stage 3
  - Excluding Natural Perils under proportional treaties
  - Withdrawing from the market
- Cat Modelling

# Possible Solutions and Suggestions to Protect the Environment

- Various initiatives have taken place towards developing a “green world”
- Green banking initiative is very interesting
- Can the Industry work towards green insurance?
  - Abstain underwriting obvious risks which are polluting the environment .
  - Abstain insuring motor vehicles which have high carbon dioxide emission levels.
  - Encourage discounts for environmental friendly projects
  - Reward energy saving initiatives .
  - Highlight environmental issues during risk inspections.

# Possible Solutions and Suggestions to Protect the Environment

**Other possible actions - Also proposed in the UNEP Financial Initiative – Principles for Sustainable Insurance (PSI)**

- **Company strategy**
  - Priority to be given to environmental issues when developing company strategy.
  - Dialogue with the all stakeholders about the relevance of environmental issues in the Company strategy.
  - Integrate environmental issues into recruitment, training and employee engagement programmes

# GREEN HOUSE EFFECT

## VEHICLE EMISSION TEST CERTIFICATE



SERIAL NO : LE 150972057

SYSTEM NO : E 9142057

**VEHICLE DETAILS**

**ORIGINAL**

DATE OF ISSUE 20 Jul 2015

REG. NO. WPUQ7380



MAKE BAJAJ

VEHICLE CLASS MOTOR CYCLE

MODEL CT 100

CHASSIS NO. MD2DDDUZZRWF10022

YEAR OF MFG. 2008

ENGINE NO. DUMBRF60646

FUEL TYPE Petrol

**TEST DETAILS**

CENTRE Neluwa

12:56 / 12:58

ODOMETER 88810

TEST FEE 410.00

TEST START/END

LANE 1

INSPECTOR nadeshc

Petrol	SPEED RPM	HC(PPm v/v)	CO(% v/v)	LAMBDA	O2	CO2	STATUS	OVERALL STATUS
STANDARD		9000	6					
IDLE	3320	2093	5.34	0.98	5.24	7.69	Pass	PASS
ACC	2400	1524	5.72	1.03	6.12	7.44	Pass	

CER128-00002557

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Valid Till:

**2016 - 07 - 20**

8822748  
 Revenue License No.,  
 Signature and Rubber Stamp of issuing office

AUTHORIZED SIGNATURE

LE 150972057

# Possible Solutions and Suggestions to Protect the Environment

- **Risk Management and Underwriting**

- Establish a process to identify and assess environmental issues in the Portfolio underwriting and be aware of the possible environmental consequences of the company transactions.
- Integrate environmental issues into risk management, underwriting and decision making

- **Product Development**

- **Develop products** which reduce risks, have a positive impact on environmental issues and encourage better risk management
- Develop & support awareness programmes on risk insurance and environmental issues

# Possible Solutions and Suggestions to Protect the Environment

- **Claims Management**

- Integrate environmental issues into repairs replacement and claims services
- Due consideration about environment when disposing salvage
- Give priority to environment issues for pre & post loss minimization

- **Sales & Marketing**

- Educate Sales & Marketing staff on environmental issues relevant to products /services and integrate the key message about the environment in the marketing campaigns

# Possible Solutions and Suggestions to Protect the Environment

- **Sales & Marketing (Contd..)**

- Convey clearly to the clients cost/benefit as a result of protection of the environment.

- **Investment Management**

- Integrate environmental issues into investment decision making

- **Working with clients & suppliers**

- Create awareness about the company policy related to environmental issues
- Dialogue with them on benefits of managing environmental issues
- Share with them information and tools that may help them to manage environmental issues

# Possible Solutions and Suggestions to Protect the Environment

- Working with clients & suppliers (contd..)
  - Integrate environmental issues into tender and selection process for suppliers
  - Encourage clients & suppliers to disclose environment issues in the reporting frame work.
- Government and Regulators
  - Support legal frame work that enable risk reduction and better management of environmental issues
- Other Stake Holders
  - Develop dialog with inter-governmental and non-governmental organizations
  - Dialog with the Industry Associations
  - Promote research and education programmes

# Possible Solutions and Suggestions to Protect the Environment

- Other Stakeholders
  - Dialogue with media to promote public awareness of environmental issues
  - Promote protection of environment through good risk management
  - Assess, measure and monitor company's progress in managing environmental issue and regularly disclose to the public
  - Participating relevant disclosures or reporting frame work

**Together we can change  
the World**

**Thank You.....**