

# GHG Emission Inventorisation

Green Makes Business Sense

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## Background

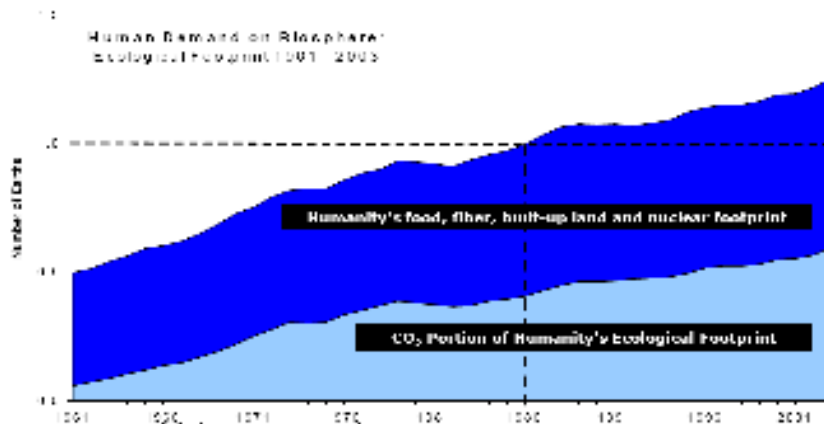
- ❖ **For to achieve a developed country status**
  - **Need to maintain high GDP growth rates**
- ❖ **Flipside of higher growth rates**
  - **Increased use of normal resources**
    - ❑ **Energy, water, etc.**
  - **Increased emissions & discharges**
- ❖ **Need to focus on ecologically sustainable growth**

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## Ecological Footprint

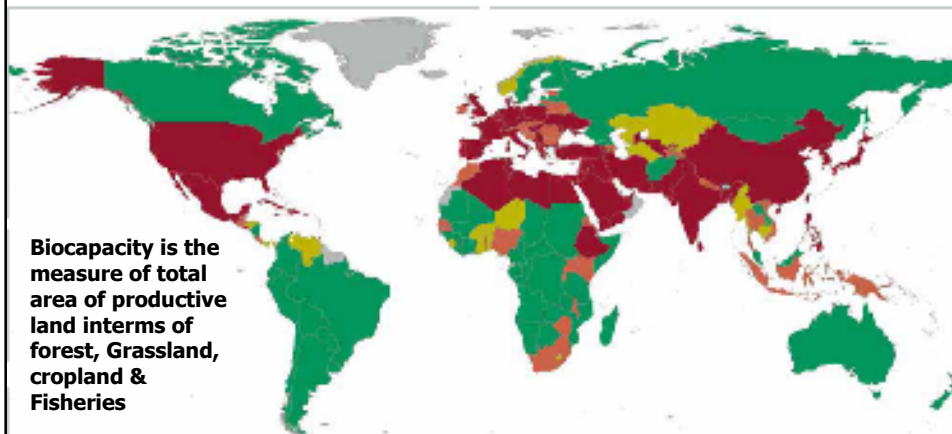
- ❖ Measure of how much land & water is needed to produce the resources we consume and to dispose the waste we produce



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## Ecological Debtor & Creditor Countries



### Debtors

- Footprint = 1.0 - 1.5 Biocapacity
- Footprint > 1.5 Biocapacity

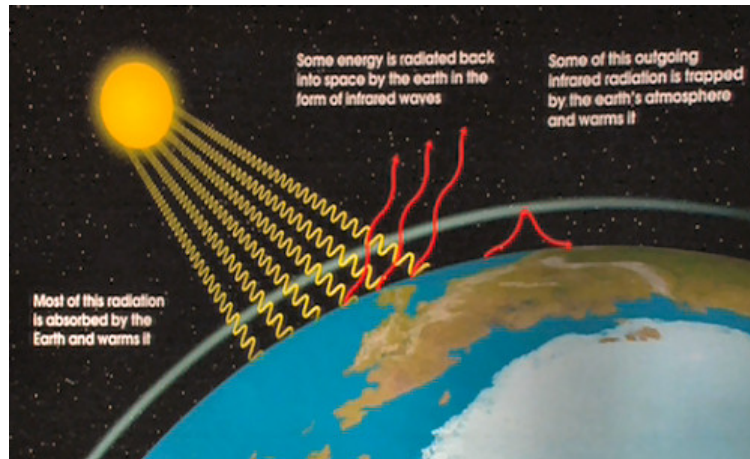
### Creditors

- Biocapacity = 1.0 - 1.5 Footprint
- Biocapacity > 1.5 Footprint

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## Green house effect



**Average temp of earth : 15 deg C**

**Without GHG : -17.8 deg C**

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## GHG Concentration levels

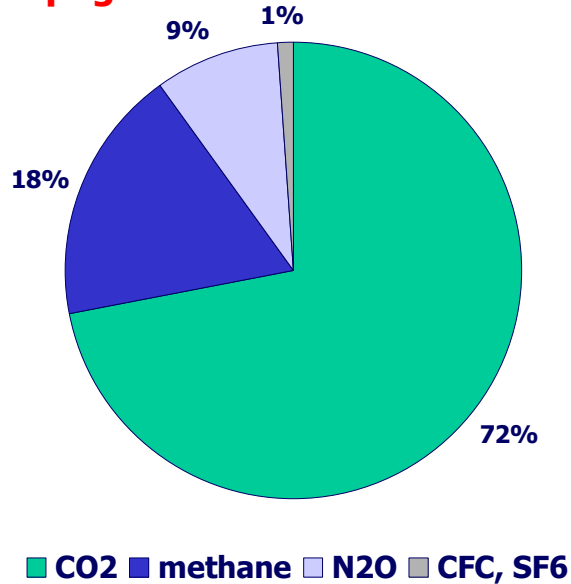
GHG listed in Annex A of Kyoto Protocol					
s no	GHG	unit	Year 1750	Year 2007	GWP
1	CO <sub>2</sub>	ppm	280	384	1
2	CH <sub>4</sub>	ppb	700	1857	25
3	N <sub>2</sub> O	ppb	270	321	298
4	CFC 12	ppt	0	541	10900
5	HFC 134a	ppt	0	49	1430
6	SF <sub>6</sub>	ppt	0	6.4	22800

- ❖ GWP – Global Warming Potential
- ❖ Source : National Oceanic and Atmospheric Administration  
[www.esrl.noaa.gov/gmd/ccgg/trends](http://www.esrl.noaa.gov/gmd/ccgg/trends)  
<http://cdiac.ornl.gov/ndps/alegaga.html>

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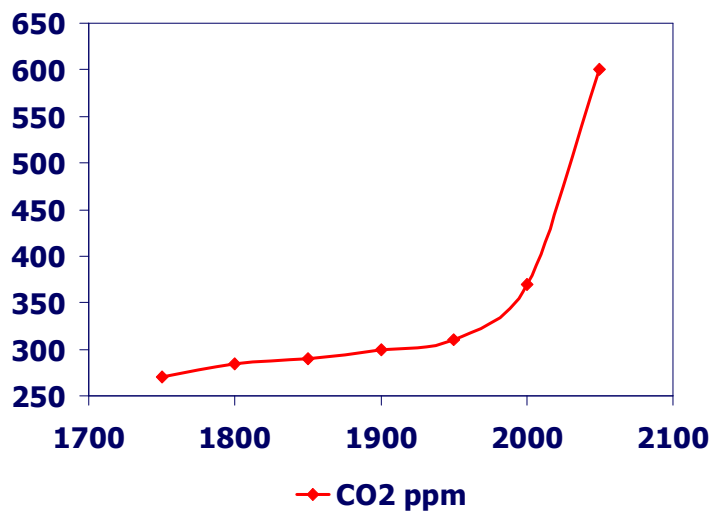
### Anthropogenic GHG with emission levels



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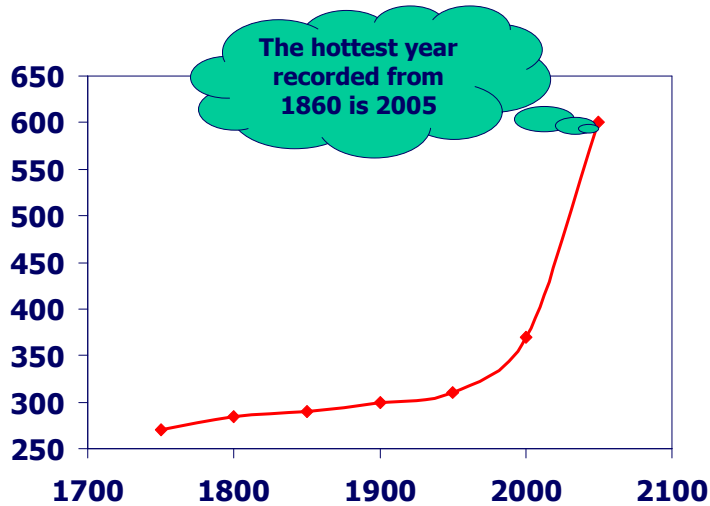
### CO<sub>2</sub> concentration increase



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## Global temperature increase



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## Effects of Global Warming

- ❖ **Melting of Glaciers – threat for drinking water**
- ❖ **Sea level rise and inundation**
- ❖ **Climate changes – Draughts and cyclones**
- ❖ **Health effects**

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## Effect on Glaciers

### Muir and Riggs Glaciers



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## Himalayan Glacier

- ❖ **Covers 17% of greater Himalayan region**
- ❖ **113,000 square km area**
  - **Largest after polar regions**
- ❖ **Nine largest rivers serving 1.3 billion people**
- ❖ **Gangotri - rate of depletion is on increasing trend**

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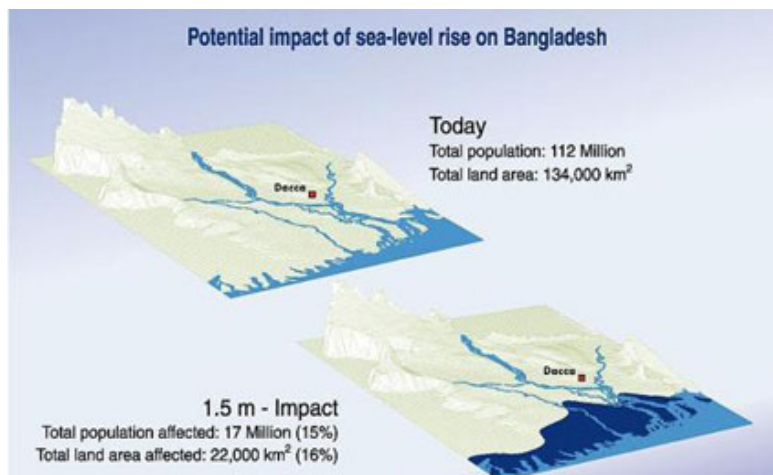
## Gangotri Glacier



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## Effect of Sea Level Rise



**6 Crore people have to shift in Calcutta and Bangladesh**

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## Places that would be affected

❖ **Sea level is expected to rise by 18 – 60 cm by 2050**

- **7.2 Cr people in china will be affected**
- **7.1 Cr in India and Bangladesh**

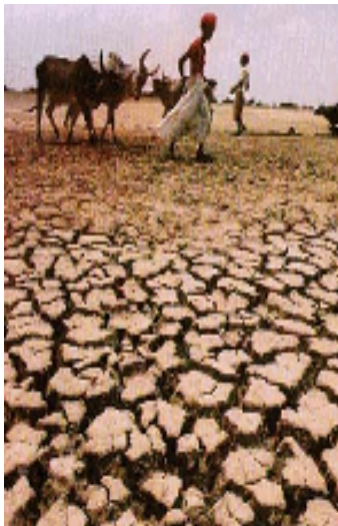
❖ **The places affected will be**

- **Maldives**
- **Chennai**
- **Mumbai**

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## Climate Change



**20000 People died  
Europe**



**994 mm in 24 hrs**

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## **Climate Change**

- ❖ **Tropical cyclones in Atlantic region**
  - **6 between 1900 – 1930**
  - **30 between 1995 – 2005**
- ❖ **1700 species of plants, animals and insets moved towards polar regions in last 50 years**

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## **Human Health Affect**

- ❖ **As per WHO report 150,000 people die in developing countries every year due to the effects of global warming**
  - **Malaria, extreme heat, cold and flood**
- ❖ **Diseases spreading more**
  - **Malaria**
  - **Dengue fever**
  - **Yellow fever**

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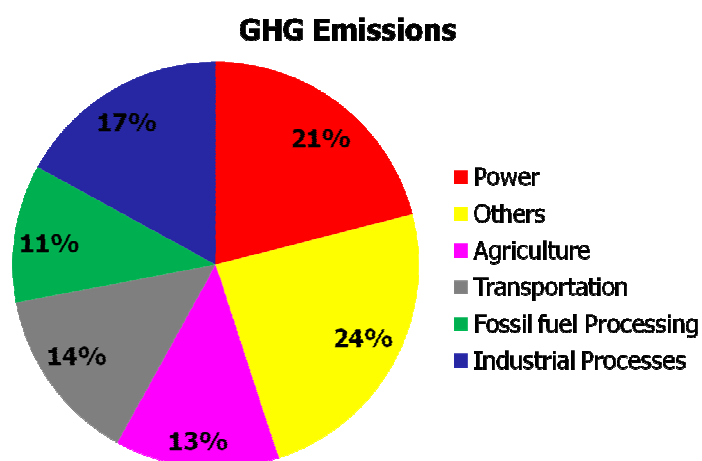
## Climate Change

- ❖ **Impact of GHG on climate change**
  - **Proven beyond doubt**
- ❖ **Several countries**
  - **Already impacted by climate change**
  - **Business, agriculture, services, economy affected**
- ❖ **Need to evolve a holistic approach globally to combat climate change**

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## Sources of Emissions – India



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## **Carbon Footprint & Mitigation**

- ❖ **GoI : 20-25% reduction in emission intensity of 2005 levels by 2020**
  - Higher responsibility & drive on industry
- ❖ **Need of the hour**
  - Proactively establish carbon footprint
  - Explore mitigation options
  - Preparedness for future regulatory requirements
- ❖ **Next steps**
  - Chalk out clear road map – short term & long term targets
  - Public reporting

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## **Approach in this exercise**

- 1. Inventorise current level of emissions**
  - ❖ Detailed emissions source wise
- 2. Identify emission reduction opportunities**
  - ❖ Efficiency improvement, logistic management, etc
- 3. Take necessary actions to reduce emissions**
  - ❖ Results in reduction in energy cost – power, fuel, transport, etc.

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## **GHG Inventorisation**

- ❖ **Quantification of total Green House Gas (GHG) Emissions arising from business activity**
  - **Combustion of fuel, transportation of cement, clinker & other material, business travel, employee commute, etc.**

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## **GHG Inventorisation - Benefits**

- **Inventorisation of emission and setting targets in accordance with globally acceptable standards**
  - ❖ **Direct reduction in energy consumption**
  - ❖ **Reduction in energy costs – power, fuel & transport**
- **Proactive approach to establish GHG baseline and reduction**

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## **GHG Inventorisation - Benefits**

- **Gearing for Voluntary Emission Reduction (VER) Markets**
- **Fulfilling its social commitment of being an environmentally conscious company and working towards sustainable development**

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## **Level of Inventorisation**

- ❖ **Corporate level**
  - **Overall emission levels including at all facilities**
- ❖ **Plant level**
  - **Specific plant & its associated operation**

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## Types of Emissions

### ❖ Direct

- Activities owned or controlled by the company
  - ❑ Fuel consumption at facility

### ❖ Indirect

- Occur at sources owned or controlled by another company
  - ❑ Purchased power
  - ❑ Transportation through contract vehicles

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## Types of Emissions

### ❖ Scope 1

- Direct emissions owned or controlled by the company

### ❖ Scope 2

- Indirect emissions from the generation of purchased electricity & clinker

### ❖ Scope 3

- All other Indirect emissions

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## The Three scopes

### ❖ Scope 1: Direct GHG emissions

#### ➤ Emissions from sources owned or controlled by the company

- ❑ Fuel consumption for calcination
- ❑ Fuel consumption for DG sets
- ❑ Fuel consumption of company owned vehicles
- ❑ Fuel consumption for HAG
- ❑ LPG consumption for cutting /welding

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## The Three scopes

### ❖ Scope 2: Indirect GHG emission

#### ➤ Purchased electricity from grid

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## The Three scopes

### ❖ Scope 3: Other indirect GHG emissions

- All other indirect emissions
- A consequence of the activities of the company, but occur from sources not owned or controlled by the company
  - ❑ Transportation of cement
  - ❑ Transportation of coal, fly ash, gypsum & other raw material
  - ❑ Business travel, employee commute

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## Data Required

- ❖ Production details
  - Raw meal consumption, Clinker production, CaO & MgO in clinker, Cement production & additives consumption
- ❖ Energy consumption details
  - Fuel consumption & NCV of fuel
    - ❑ Coal & start up fuel
  - Electrical energy consumption
- ❖ Transportation details
  - Raw materials & cement
- ❖ Accuracy of data is important to estimate emissions accurately

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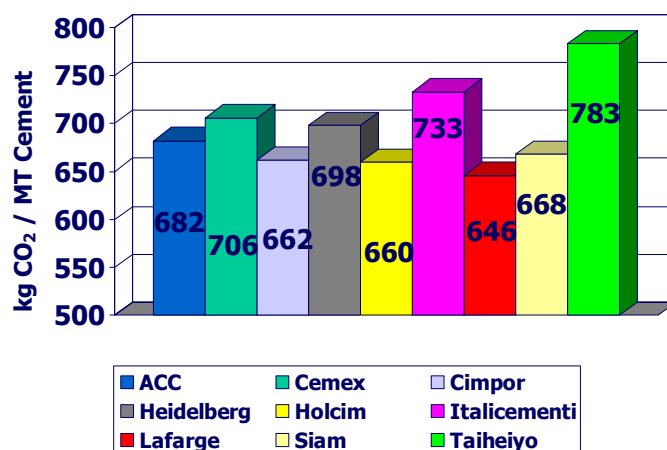
## GHG Emission Reduction opportunities

- ❖ Reduction in specific energy consumption
- ❖ Maximising additives as per norms in cement
- ❖ Usage of Bulk transport (Rail) instead of Road
  - Road transport releases 2.5 times the GHG emission than rail per MT of material transported for the same distance
- ❖ Logistics Management
  - Compulsory back haulage
  - Bulk transport

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## Emission Levels - Global values



Source : Respective CSR websites , 2007 data

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**Thank you**

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