



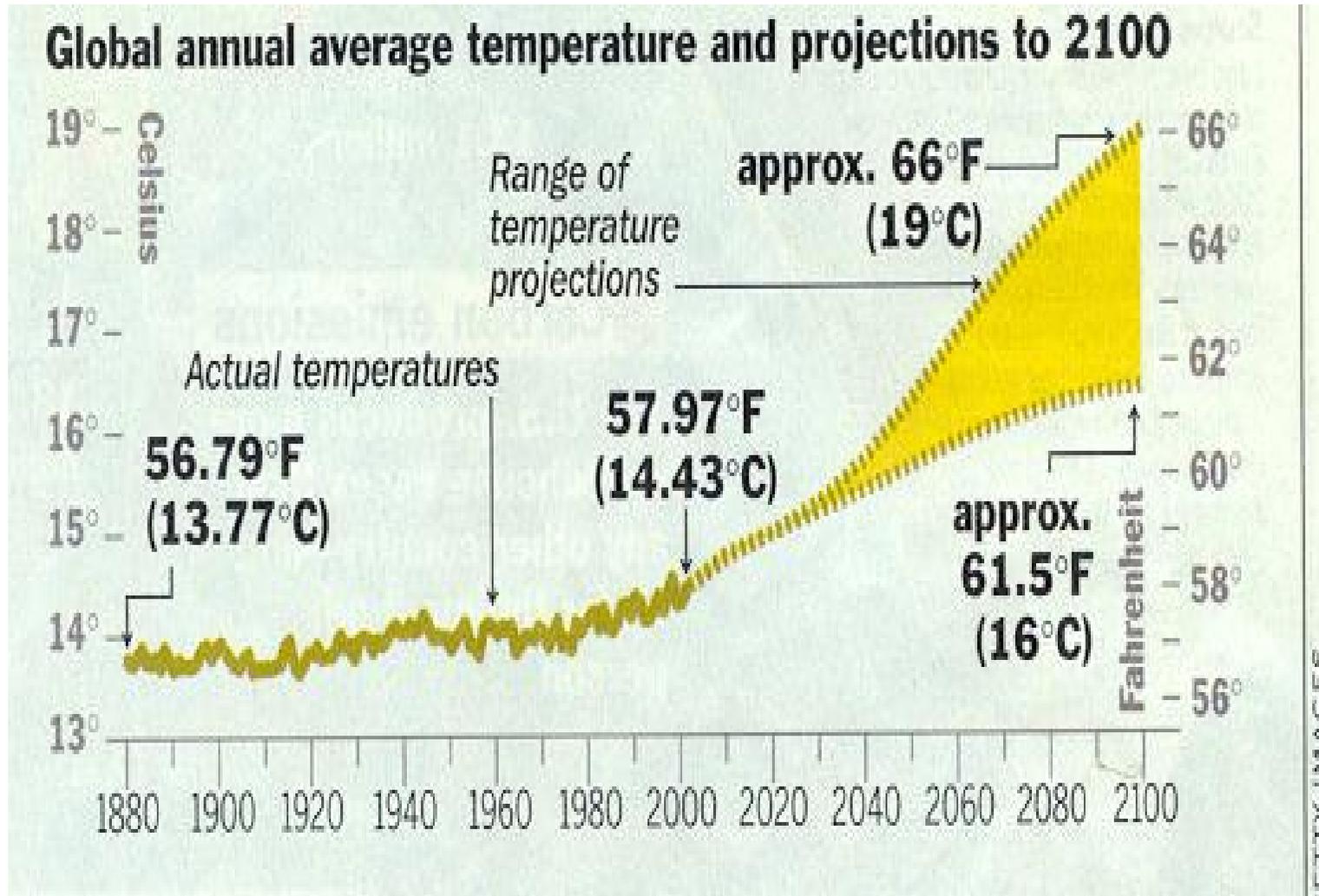
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Climate Change

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- Global Warming and Climate Change are used interchangeably.
- Are we convinced that the world is warming up ? Some hints:
 - The world has its seasons in one year: Summer, Spring, Winter, Rainy, etc
 - Questions to ask:
 1. In recent years, winters are less cold and shorter than before. True or False ?
 2. In recent years, summer are hotter and longer than before. True or False ?
 3. In recent years, rainy seasons are shorter/longer than before. True or False
 4. In recent years, we have experienced unusual climatic variance, such as more severe and frequent storms. True or False ?
 - Different generations have different answers !!!!!
 - A number of organizations have conducted thorough study on this and confirm that the world is warming up in recent years , with a tendency to be warmer and warmer in the future.

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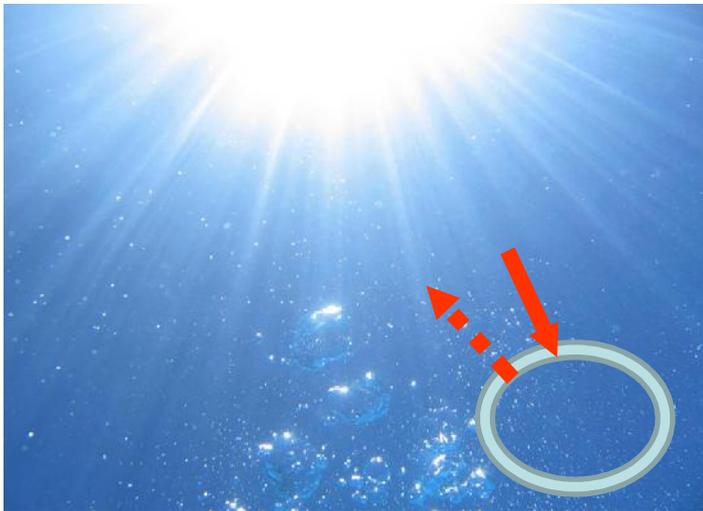
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- **Climate Change poses a threat to biodiversity.**
- **Climate Change , in combination with current rate of land degradation, poses a major threat to food and water security in Asia and the Pacific:**
 - ❑ **Cultivable areas for most staple crop decrease, overall production decrease - price increase - reduced consumption - increased malnutrition**
 - ❑ **Shortage of water ,both surface and underground water for consumption and agricultural practice**
 - ❑ **Significant risks in flood and droughts.**

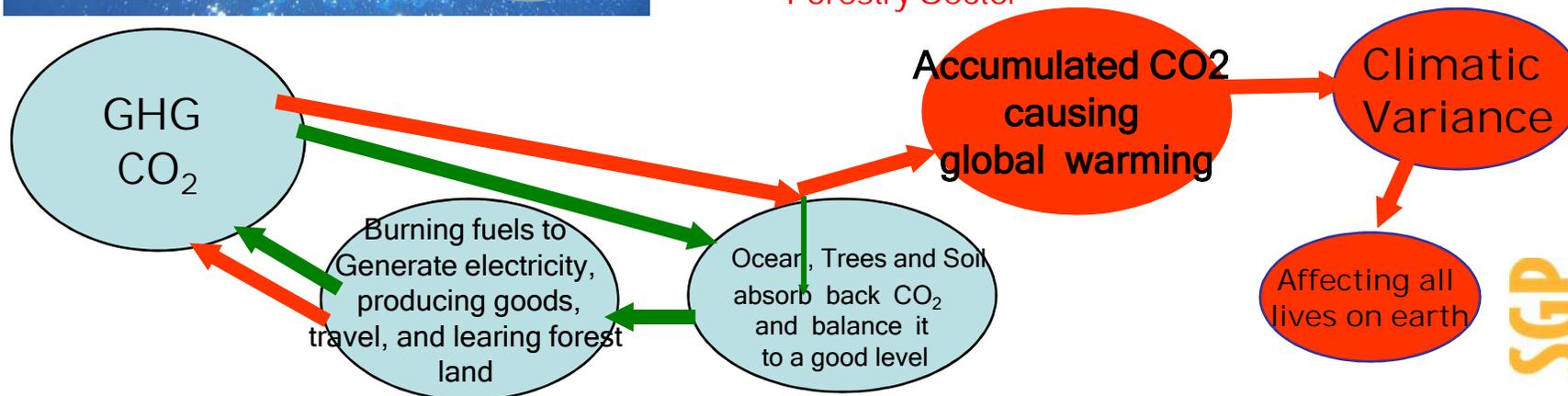
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How is the world getting warmer ?

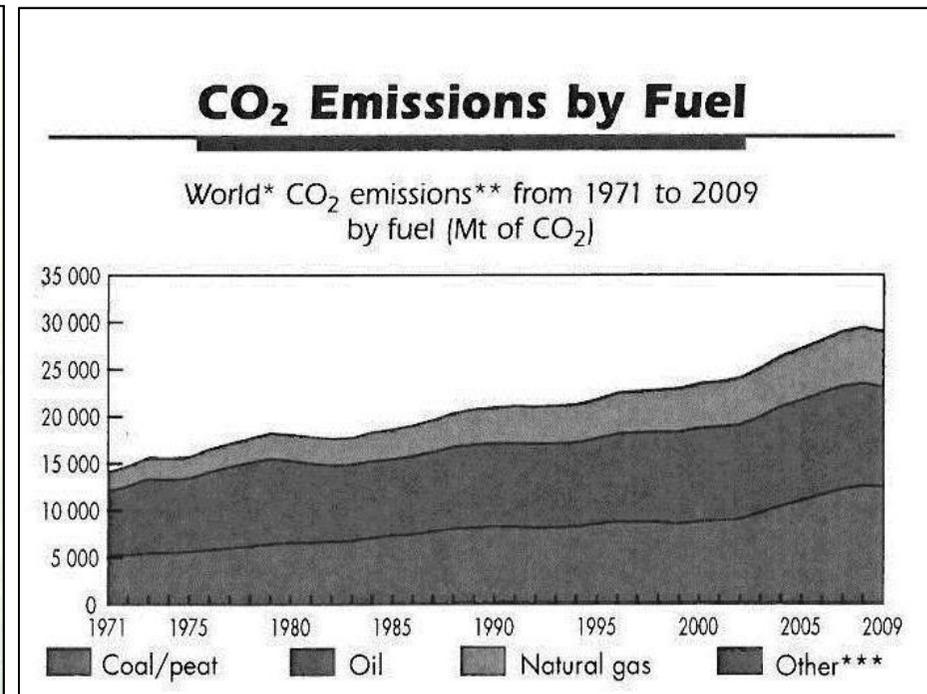
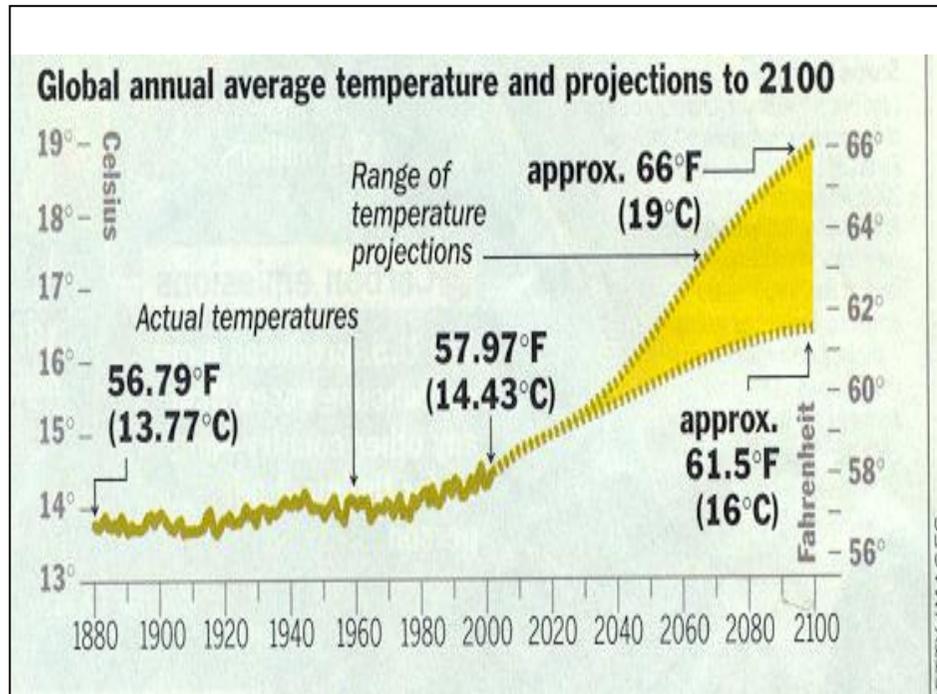
- Natural heat transfer rate from the earth into the atmosphere is less than before, because there is more accumulated greenhouse gas in the atmosphere to block it.



- GHG exists naturally but in a life-supporting amount.
- During the past 50-60 years, the amount of GHG in the atmosphere has been increased significantly.
- GHG: CO_2 , CH_4 , N_2O etc, with CO_2 as the main culprit for GEF to cope with
- **More CO_2** come from 2 main activities of human being:
 1. Human being burns **more** fuels in livelihood activities - **Energy Sector**
 2. Human being causes more land use changes in livelihood activities, thus less carbon sinks - **Land Use and Forestry Sector**



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The year 1971, the world emitted 16,000 MT of CO₂ into the atmosphere
The year 2008, the world emitted 29,000 MT of CO₂ into the atmosphere

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➤ Examples of human activities that emit CO₂ into the atmosphere involve burning !!!!!



Types of Burning	CO ₂ Emitted
1 litre of Diesel	2.8 kg.
1 litre of Gasoline	2.2 kg.
1 litre of LPG (canned gas)	1.5 kg.
1 kg. of Fire-woods	1.46 kg.
Burn to generate one unit of electricity (Thailand, 2008)	0.57 kg.

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- Breakdown of fuel use for generating electricity in 2008 (Thailand)

Types of Fuels	Generated Electricity (Million units)	Amount of Fuel Burned	Emitted CO2 (Million tons)
Natural Gas	49,310.86	428,018.16 million cu.ft	24,489.16
Coal (Lignite)	16,019.84	16.40 million tons	16,618.76
Fuel Oil	511.36	140.08 million litres	0.43
Diesel	32.26	12.43 million litres	0.33
Hydro	5,324.78	-	-
Renewable Energy	6.37	-	-
Total	71,205.47		41,108.68

- Everyone in Thailand using electricity in 2008 had a share in this emission.
- Conservation of electricity or avoidance of electricity use will help reduce CO2 emission and mitigate global warming and climate change
- **How can a community stabilize or reduce the use of these fuels ?**

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CO2 Emission from Land Use, Land Use Change and Forestry (LULUF)

- The majority of GHG emissions in developing countries results from land-use change, such as deforestation, and the degradation of soils, forest lands, wetlands, peatlands, and “blue forests” in the marine realm
- Thai forest is a significant source to absorb CO₂ - about 50 tons per ha per year. What about other countries ?
- In 1961, the area of Forest = 55 % of the country area
In 1998, the area of Forest = 25 % of the country area
- Current forest area of the world < 40 %
- Natural forest has more capacity to absorb CO₂ than new or reforested forest, because of :
 - quicker regeneration after wild fire
 - resistance to and recovery from pests and diseases
 - adaptation to changes in radiation, temperature and water
- How can a community help avoid CO₂ emission from LULUF ?

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World CO2 Emission from Burning Fuels in Energy Sector (million tons)				
Year	1990	1997	2008	2020
Emission Amount	20,878	22,561	29,575	36,102

Thailand CO2 Emission from Burning Fuels in Energy Sector (million tons)				
Year	2007	2008	2009	2010
Emission Amount	195	198	197	216

Thailand CO2 Emission from LULUF (million tons)				
Year	2001	2002	2003	2004
Emission Amount	18	28	29	30

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How can a community avoid emission of excessive CO2 ?

- Each one should cooperate to slow down the emission from daily activities so that the accumulated CO2 is at a safe level by
 - conserving energy , Energy Efficiency (OP # 5)
 - promoting the adoption of renewable energy , such as biogas, biomass, solar, wind, water, geo- thermal, manual energy, etc (OP # 6)
 - promoting environmentally friendly transport (OP #11)
 - conserving and enhancing existing high-capacity carbon stocks, such as wetlands, peatlands, and “blue forests”
- Targeted population and location
 1. Agricultural communities which consume a lot of commercial energy in livelihood activities
 2. Agricultural communities and communities in municipalities which consume a lot of fuels in transportation
 3. Communities residing in high - capacity carbon stocks such as wetland, deserted cultivated land , blue forest

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SGP Project Framework on Climate Change in OP 5

Project Component	Expected Outcomes	Indicative Activities	Some signs of accomplishment
Reduction or Avoidance of GHG Emissions While Building Climate Resilience at the Community-level	Demonstration, development and transfer of low-GHG technologies at the community level	1. Building capacity of community and stakeholder to ensure understanding on climate change and its long term effects , and on solution by collective use of renewable energy and energy conservation and enhancing carbon stock	1. Wider public understanding the use of various types of renewable energy and putting into use on daily live, such as, distributed micro-solar, micro-hydro, biogas and methane energy generation, and solar /fuel-efficient stoves
	Increase energy efficiency, low-GHG transport at the community level	2. Fabricating, building, installing and using renewable energy equipment in daily live and recording reduction/avoidance of conventional energy	2. More systematical and substantial community mode of transport through 2 and 3-wheel batteries and manual operated and through biodiesel transport
	Conservation and enhancement of carbon stocks through sustainable management and climate proofing of land use, land use change and forestry	3. Systematically managing land use pattern and forest by community forest process, reforestation, afforestation, forest rehabilitation, with participation from stakeholder 4. etc.	3. Stronger community forest models, deserted land , wetland, marginal land and even private land being managed appropriately through reforestation/ afforestation

How many kilogramme of CO2 would be avoided or reduced ? How many families ?