

Climate Change: Global Warming

1. CO2 Concentration in Atmosphere Correlates with the Earth's Temperature

- In the last 160,000 years, CO2 concentration has been stable:
Minimum: 200 ppm (Ice age)
Maximum: 280 ppm (Warm period)
- CO2 concentration is rapidly increasing due to uncontrolled worldwide economic development based on a mass combustion of oil and coal.
- At present, the concentration is above 360 ppm (the difference, 80 ppm, is equivalent to the difference between ice age and warm period).

2. Effects of Climatic Change (IPCC Report)

The Earth's average temperature will rise by 5.8 degrees

(In the last 50 years, it has already risen by 0.5 degrees)

- The world's forests which cannot adjust to this change will die
→ Further increasing CO2 concentration, thereby accelerating global warming
- Melting of permafrost
→ will also accelerate global warming through methane emissions
- Negative impact on agriculture → World food crisis

Sea Level will Rise by 50 cm ~ 1 meter

- 40 countries such as the Maldives will be submerged
→ Hundreds of million environmental refugees
- Submergence of agricultural land, increase of salinization
→ Worldwide food crisis
- Desertification and flooding by abnormal weather due to changes in precipitation levels and climate
- Spreading of contagious diseases such as malaria and cholera
- * Possibility of 5 meter sea level rise by falling of Antarctic ice sheet.

3. In Japan

- 80% of total beach will be lost by a 1-meter rise of sea level.
→ 4.1 million people will be affected. (Property loss is equal to 90 billion yen.)
- Expanding size of typhoons will cause natural disasters such as flood tide.
- Loss of forests including beech trees → Extinction of biospecies
- Negative impacts on agriculture by unusual weather patterns.
→ Japan will face a critical situation, with less than 30% self-sufficiency rate of food production level.
- Increase infectious diseases such as malaria.

4. Further Risks

In the Arctic, the temperature has already risen by 2.5 degrees in the last 100 years, and is estimated to rise by more than 10 degrees in the next 100 years.

- If the Antarctic ice sheet (40 times the size of Japan; thickness: 2,500 meters on average) melts, we can expect a 70-meter rise in sea level. Huge glaciers have already moved and huge icebergs have already flown out.
- If huge iceberg collapse and huge tsunami (tidal wave) is caused, coastal industrial regions will be destroyed.
 1. If crude oil ran out → death of the sea
 2. If many atomic power plants fall down → death of the earth

5. Causes of Climate Change

- Increase of green house gases in the air, including CO₂, CFCs, methane, NO_x etc.
- CO₂ emission is in direct proportion to the level of economic development and living standard of the country.
- The CO₂ emissions level of developed economies is more than 10 times than that of developing countries (such as Africa, India, etc.).
- In the last 40 years, electricity consumption in Japan has increased 20 times and the number of cars has risen 50 times.
- Developed countries expand their economy more and more, and developing countries follow in “Catch up, Get ahead!” way.
- If we keep going on at this pace, CO₂ concentration will rise to 500ppm in 100 years, causing the earth beginning to heat up(runaway effect).

6. Conclusion of IPCC Report

- CO₂ emission should be reduced 60 - 80 %.
- Developed countries, whose emissions are dozens of times compared to the CO₂ level of developing countries, should reduce emissions by 96%(USA), 91%(Japan)

7. The United Nations Framework: Convention on Climate Change (COP3) :

Kyoto, December 1997

- Approximately 5.2% reduction of CO₂ emission amongst developed countries was determined in the conference. However, this small rate of reduction will have no effect in preventing climate change, because developing countries will increase their CO₂ emissions year by year for their economic development.
- Japan, the host country, lost credibility and did not play a strong coordinating role, instead, disturbed the conference.
- “Measures for global warming can be too late, due to the increase of CO₂ emissions”(1999 UNEP)

8. CO₂ Emission Reduction Plan by Each State (UNFCCC 2002)

Germany: -25% (Present 19% Reduction)

UK: -23% (Present 12% Reduction)

USA: -7% (Present 14% INCREASE)

Japan: -6% (Present 11% INCREASE)

⇒ EU decided to reduce 20-40% before 2020, in the long-term 70%

⇒ Japan and the USA is backsliding – substantially making it impossible to reach the Reduction Plan

9. What We can do (in Developed Countries)

(Following data is based on average Japanese household's data)

To achieve a 20 % reduction

The rate of CO2 reduction at home

- Less driving (half): 18%
- Stop engine idling: 4 %
- Minimize use of air-conditioner (half): 8%
- Bathing less (ex. every other day): 7 %
- Switch off electrical appliances at the power point, when not in use.: 3 %

Happy family life (living together) saves energy

- Eating meals together, taking bath together, spending time together

The "4 R's" is our catch cry

- Refuse, Reduce, Re-use, & Recycle
- Refuse excess packaging, not buying disposable goods