

## Ozone Layer Depletion

### 1. Ozone Layer :

- Located 20-30km above the earth's surface, it is only 3 mm thick at the pressure on the ground (1 atmosphere).
- It is rapidly being depleted by excess use of chloro-fluorocarbons (CFCs).
- If the ozone layer is destroyed, no plant or animal on the land will survive.

### 2. Chloro-fluorocarbons (CFCs) :

CFCs are used in refrigerators, air conditioners, drink vending machines, cleaners, aerosols, and foam in urethane production, etc.

### 3. In 1974, Dr. Rowland and Dr. Moline warned that in the U.S.A:

- In 10 years, there will be a hole in the ozone layer.
- In 20 years, human health will be affected.
- In 30 years, an irreversible situation will arise.

### 4. Today's CFCs Regulations

(The Montreal Protocols, revised in 1995)

Type	Coefficient of Ozone	Coefficient of the current layer destruction	Global warming restriction
CFCs (Specified freon gas)	100,000	7,000	Complete prohibition of production
HCFC (Freon gas substitute I)	10,000	4,000	Complete prohibition of production by 2020*
HFC (Freon gas substitute II)	No destruction Of ozone layer	3,000	Currently there are no restrictions.*

\*Because of the continued ozone layer depletion and global warming, the restrictions on CFC substitutes need to be increased in the near future.

## 5. The Current Situation of Ozone Layer Depletion

- UV-B (different from UV-A) damages human DNA and can cause skin cancer, sight impairment, a weakened immune system, and fall in agricultural yields and fish catches.
- A 10% destruction of the ozone layer can lead to a 26% increase of skin cancer according to UNEP (United Nations Environment Programme).
- Ozone layer depletion:
  - ➔ Over the Arctic Circle ; 40% decrease (NASA, April 8, 1997)
  - ➔ Over Japan ; 30% decrease (The National Institute for the Environment, April, 1996)
- CFCs are heavier than air, taking more than 15 years to reach the ozone layer. 2/3 of Ozone layer will be destroyed during 2010-2020.(NASA, 1998)  
=>The real crisis is only starting now.

## 6. In Most Developed Countries Except Japan...

Citizens are warned not to expose themselves to direct sunlight with slogans like:

1. “Burn time 10 minutes!” (10 min. or less to be exposed to the sunlight.)
2. Do not allow children to go out on the day of strong direct sunlight!
3. “No hat, no play!” (You should not play outside without your hat. )
4. “Slip...slip on a shirt.”  
“Slop...slop on some lotion.”  
“Slap...slap on a hat.”  
“Wrap...Wrap your eyes (wear sunglasses).”

## 7. The Present Situation of CFC Regulations in Various Countries

1. Europe and America: citizens are required, when repairing or discarding products containing CFCs (refrigerators, air conditioners, etc), to go to an authorized authority, who will properly deal with the CFCs.
2. Failure to do so will result in a fine of US\$34,000 in Germany, US\$29,000 in England, and US\$25,000 in USA.\*
3. Europe: Non-CFC refrigerators are popular. CFC vending machines are illegal.
4. America: Taxes on CFCs have been introduced.
5. In 1997, the UNFCCC (Global Warming Prevention Conference ) included CFCs in the green house gases to be reduced. There is a strong possibility that restrictions on CFCs will be strengthened in the future.

\*Figures calculated based on information in yen with 120yen = US\$1

## 8. The Current Situation in Japan

- The above-mentioned facts are not well known.
- Sunbathing and bringing up children under copious amounts of sunshine is still believed to be healthy.
- There is no national legal binding to collect CFC products or prohibit CFC emissions. CFCs output remains uncontrolled, and the number of vending machines using CFCs continues to increase.
- Some local communities have started collecting CFCs.
- UV- B index has begun to inform some local media.
- 80% of elementary schools and 60% of junior high schools in Yamanashi Prefecture have set tents over their swimming pools in order to cut UV-B.

## 9. What We Should Do

- First, protect children and ourselves with hats, long-sleeved clothes, sunglasses, and lotions, etc.
- Inform people around you and at school of the dangers of UV- B.
- Do not buy CFC products and dispose of them correctly.
- Ask manufacturers to make and shops to store non-CFCs products.
- Ask them to collect CFCs products. Express your beliefs by asking for laws to be imposed.
- Speak out! Do you want there to be a strong regulation of CFCs by law that includes their proper collection and disposal? If so, let people know!