



Environmental Impact of Refrigerants



Commonly used ODS in RAC Sector in India

<u>ODS</u>	<u>USE</u>
<u>CFCs</u>	
CFC-11	Refrigerant, Foam Blowing Agent
CFC-12	Refrigerant
CFC-502	Refrigerant
<u>HCFCs</u>	
HCFC-22	Refrigerant
HCFC-123	Refrigerant
HCFC-141b	Foam Blowing Agent



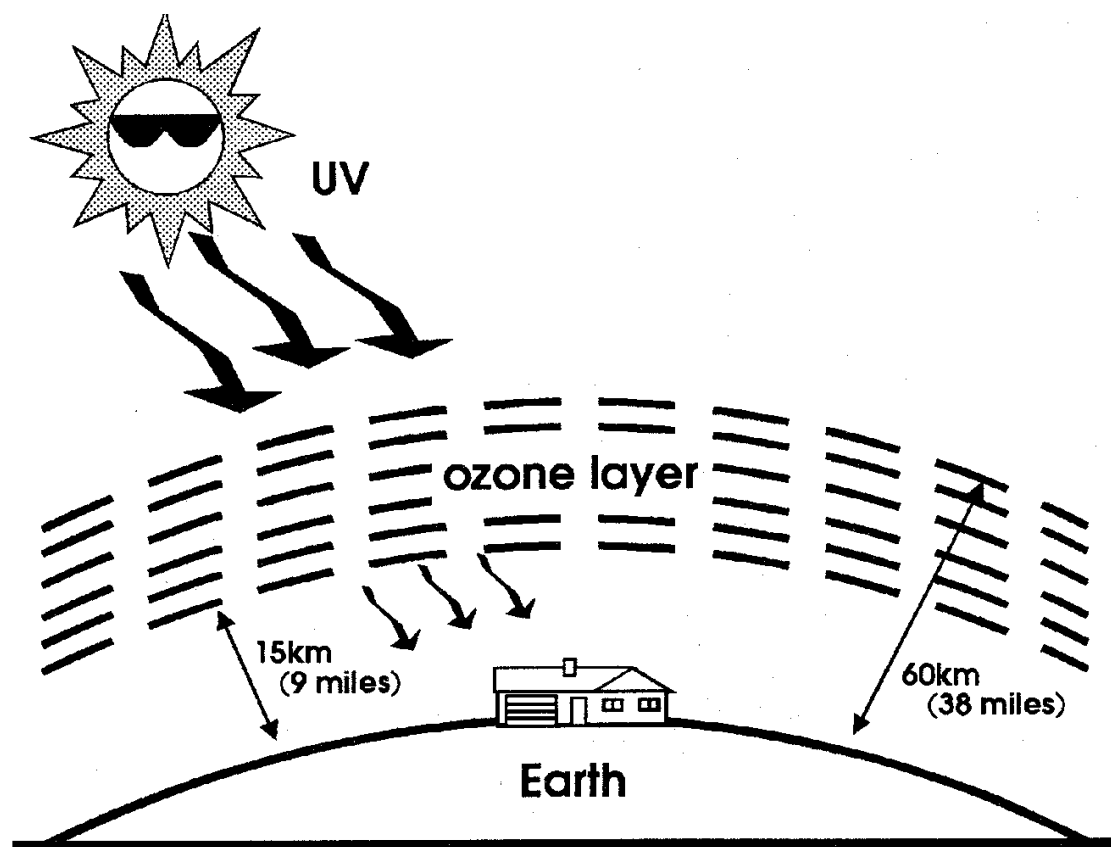
Applications of ODS

- Refrigeration & cooling appliances
- Spray/ Aerosol based cosmetic and health products/ industrial products
- Manufacture of foam
- Precision cleaning operations in industry
- Fire extinguishing systems
- Quarantine & Pre-shipment applications



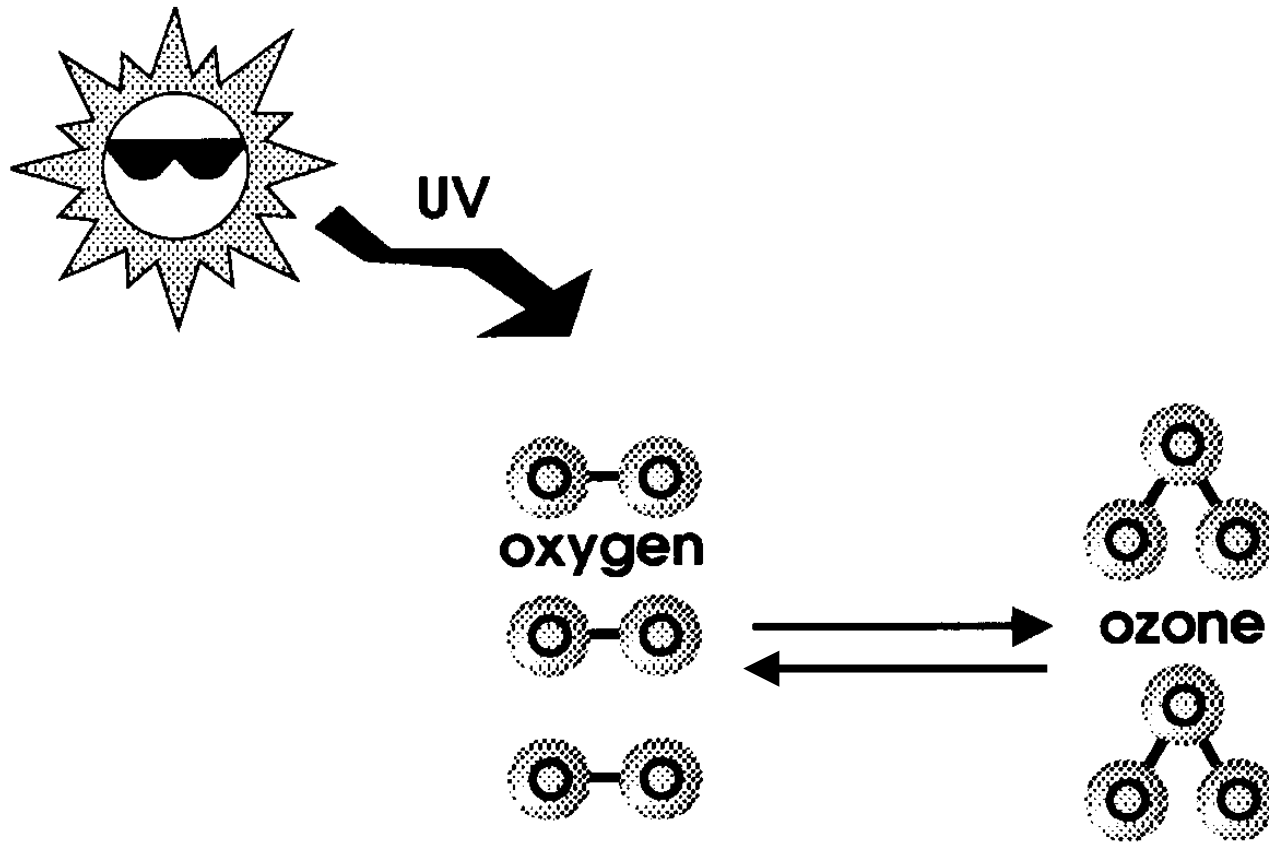


Ozone absorbs UV radiation



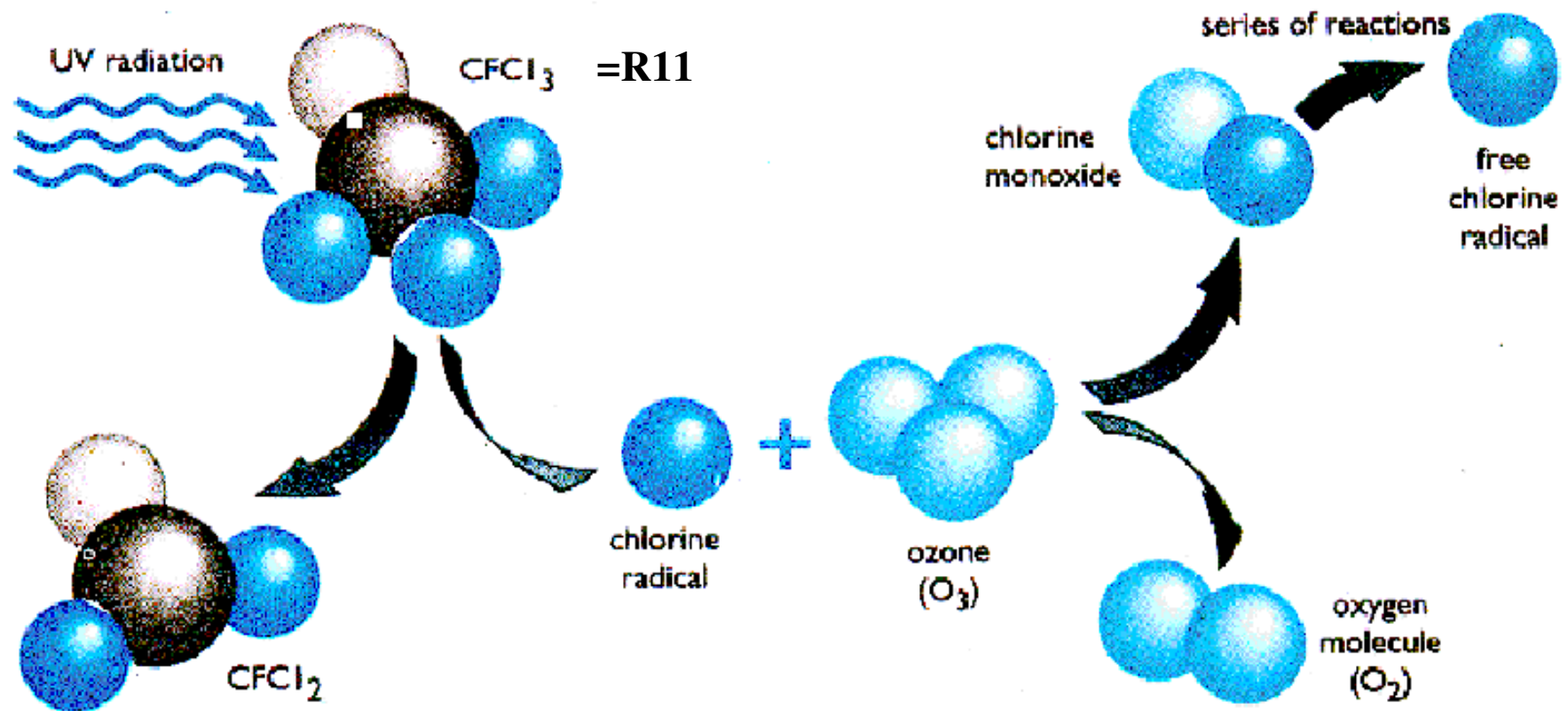


Formation of Ozone





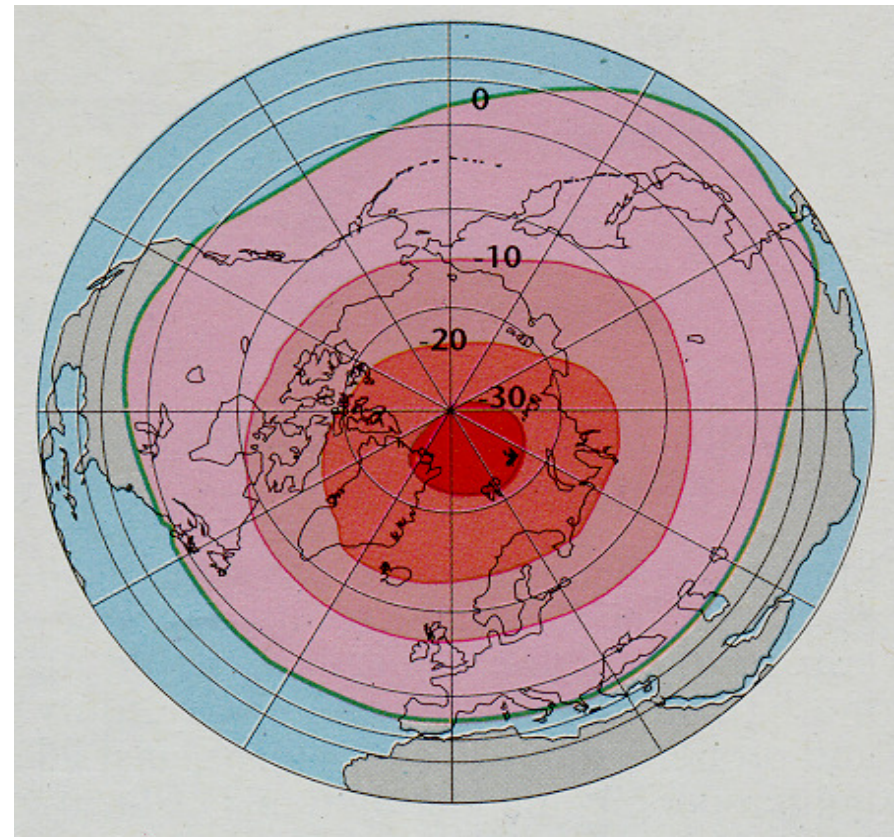
Chain reaction by CFCs





Extension of Ozone Hole

**Ozone deficiency (%)
from base period
(1957-1979) for
January-March 1996
(Source: WMO)**



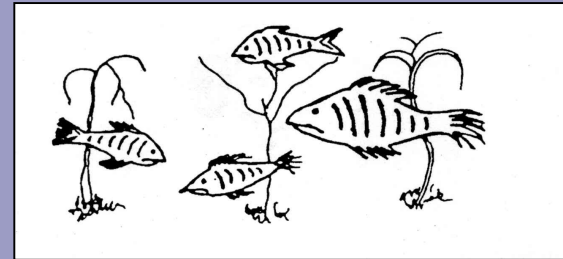


What happens if ozone layer is damaged?

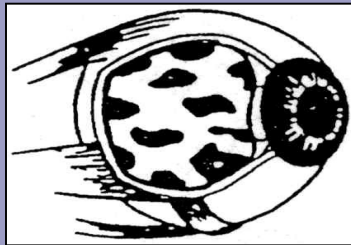
Ozone layer filters UV-B portion of sun rays, which if reaches earth, can cause:



SKIN CANCER



**AFFECT FISH AND
OTHER OCEAN LIFE**



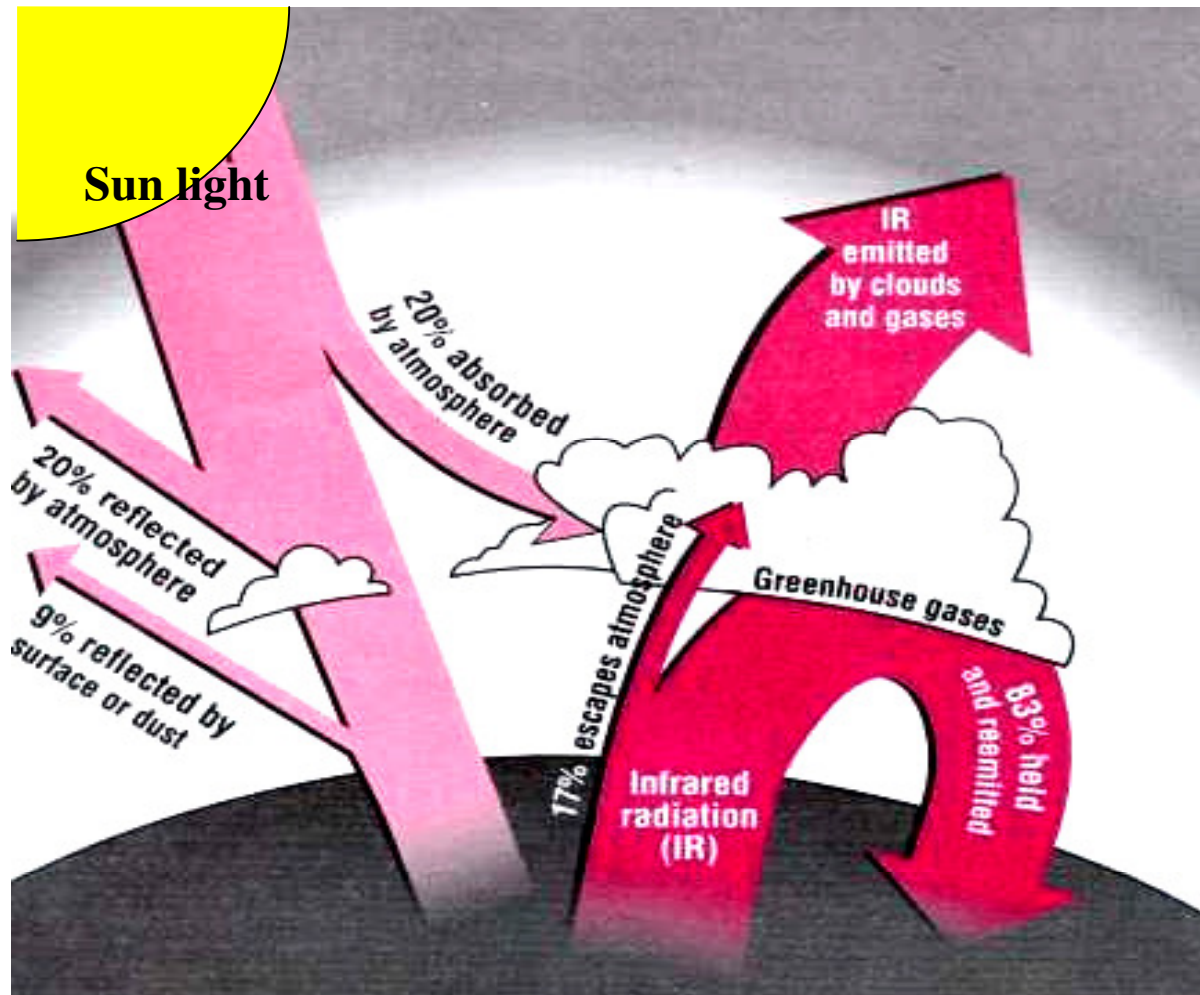
EYE DAMAGE



**SUPPRESS BODY
IMMUNE SYSTEM**



Global Warming





Environmental Characteristics

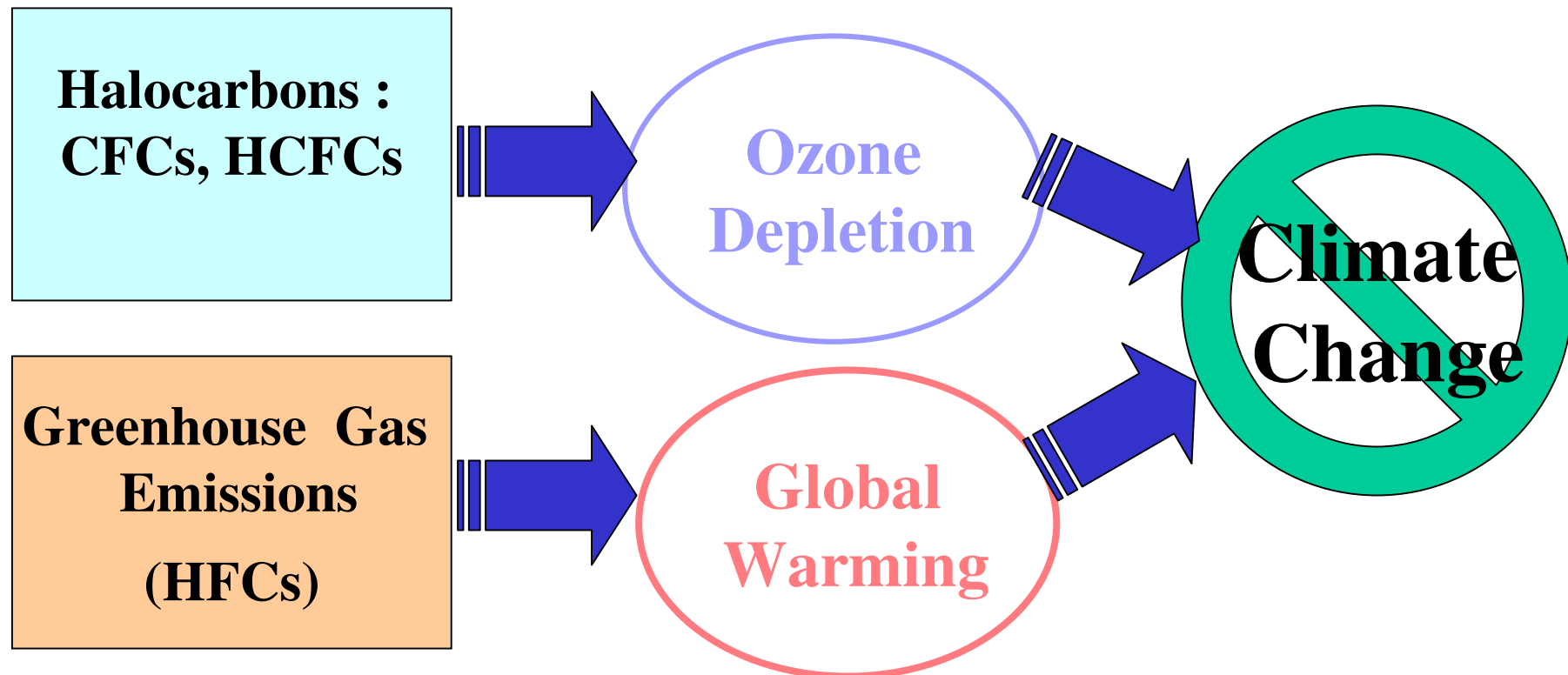
Refrigerant	Atmospheric Lifetime (Years)	ODP	GWP (100 Year)
CFCs			
CFC-11 (Baseline for ODP)	50	1.0	4000
CFC-12	102	1.0	8500
HCFCs			
HCFC-22	13.3	0.055	1700
HCFC-123	1.4	0.02	93
HCFC-141b	9.4	0.11	630
HFCs			
HFC-134a	14.6	0	1300
HFC-245fa	7.3	0	820
HCs			
HC-290 (Propane)	-	0	3
HC-600a (Isobutane)	-	0	3
Cyclo-Pentane	-	0	3
Blends			
R-404A	-	0	3260
R-407A	-	0	1770
R-407C	-	0	1530
R-410A	-	0	1730



Environmental Degradation

Our Generation

Next Generation

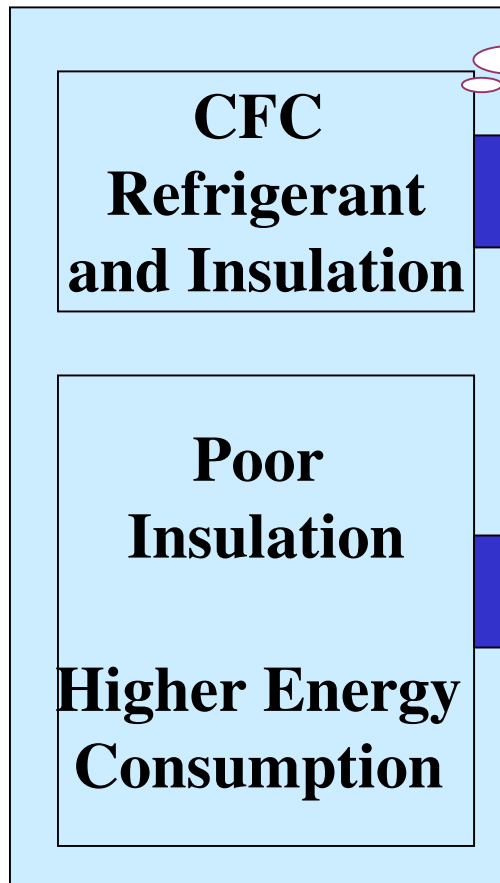




Environmental Mitigation

Our Generation

**Environmentally
Polluting**



**Transition To
CFC Free
Refrigerants**

Next Generation

**No Ozone
Depletion**

**Use of Energy
Efficient
Refrigerators**

**Reduced
Global
Warming**