18CEO406T - Global Warming and Climate Change

UNIT – IV

[S7 – S9]

.....

Topic; S7

SLO 1: Need for international protocols of climate change

SLO 2: Kyoto protocol

.....

SLO 1: Need for international protocols of climate change

The main objective of this important **climate change** treaty is to: achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the **climate** system.

The atmosphere and climate change illustrate the need for, but also the difficulty of negotiating institutionalized cooperation in order to avert the tragedy of a global commons. Climate change became an issue of political concern as the scientific evidence of human interference with the climate system increased and this was coupled with growing public concern over global environmental issues in the mid-1980s.

The **greenhouse gas emissions** of a country correlate with its gross domestic product (GDP) and thus its economic growth.

Over the course of successive **Conferences of the Parties — known as COP** — new elements have been introduced into the international structure of the negotiations on climate change. These elements allow for specific challenges to be tackled such as **mitigation financing, adaptation to climate change, and the technological transfer.**

The United Nations Conference on Environment and Development, held in Rio de Janeiro in 1992, was a reflection of the international consensus when it came to approaching the problem of climate change. **During the summit, the United Nations Framework Convention on Climate Change (UNFCCC)** was created, which was initially signed by 166 countries and finally came into force on 21 March 1994. As of today, its has been ratified by 197 countries.

Below are the most significant agreements on climate change:

i. The setting of the target for developed countries to provide 100 billion dollars for climate finance projects in developing countries.

ii. The formalisation of the goal to limit the global temperature rise to below 2ºC compared to the pre-industrial era.

iii. The launching of the Ad Hoc Working Group on the Durban Platform and its two lines of work: Workstream 1, dedicated to working towards a binding global climate agreement for the post-2020 era; and Workstream 2, dedicated to raising the level of climate ambition before 2020.

iv. The second period of commitment arising from the Kyoto Protocol runs until 2020, through what is known as the Doha Amendment (COP18).

v. The launch of the Marrakesh Partnership for Global Climate Action as a platform to involve the general public and increase their role in the process of global climate action.

.....

S7: SLO 2: Kyoto protocol

The Kyoto Protocol was adopted on Kyoto, Japan , 11 December 1997. Owing to a complex ratification process, it entered into force on 16 February 2005. By 1997, **186 nations** signed kyotoprotocoal. Currently, there are 192 Parties to the Kyoto Protocol.

In short, the Kyoto Protocol operationalizes the United Nations Framework Convention on Climate Change by committing industrialized countries and economies in transition to limit and reduce greenhouse gases (GHG) emissions in accordance with agreed individual targets. The Convention itself only asks those countries to adopt policies and measures on mitigation and to report periodically.

The Kyoto Protocol is based on the principles and provisions of the Convention and follows its annex-based structure. It only binds developed countries, and places a heavier burden on them under the principle of "common but differentiated responsibility and respective capabilities", because it recognizes that they are largely responsible for the current high levels of GHG emissions in the atmosphere.

In its Annex B, the Kyoto Protocol sets binding emission reduction targets for 37 industrialized countries and economies in transition and the European Union. Overall, these targets add up to an average 5 per cent emission reduction compared to 1990 levels over the **five year period 2008–2012 (the first commitment period).**

Doha Amendment

i. In Doha, Qatar, on 8 December 2012, the Doha Amendment to the Kyoto Protocol was adopted for a second commitment period, starting in 2013 and lasting until 2020. However, the Doha Amendment has not yet entered into force; a total of 144 instruments of acceptance are required for entry into force of the amendment. New commitments for Annex I Parties to the Kyoto Protocol who agreed to take on commitments in a second commitment period from 1 January 2013 to 31 December 2020.
ii. A revised list of greenhouse gases (GHG) to be reported on by Parties in the second commitment period.
iii. Amendments to several articles of the Kyoto Protocol which specifically referenced issues pertaining to the first commitment period and which needed to be updated for the second commitment period.

- On 21 December 2012, the amendment was circulated by the Secretary-General of the United Nations, acting in his capacity as Depositary, to all Parties to the Kyoto Protocol in accordance with Articles 20 and 21 of the Protocol.
- During the first commitment period, 37 industrialized countries and the European Community committed to reduce GHG emissions to an average of five percent against 1990 levels.
- During the second commitment period, Parties committed to reduce GHG emissions by at least 18 percent below 1990 levels in the eight-year period from 2013 to 2020; however, the composition of Parties in the second commitment period is different from the first.

KYOTO MECHANISMS

- Under the Protocol, countries must meet their targets primarily through national measures. However, the Protocol also offers them an additional means to meet their targets by way of three market-based mechanisms.

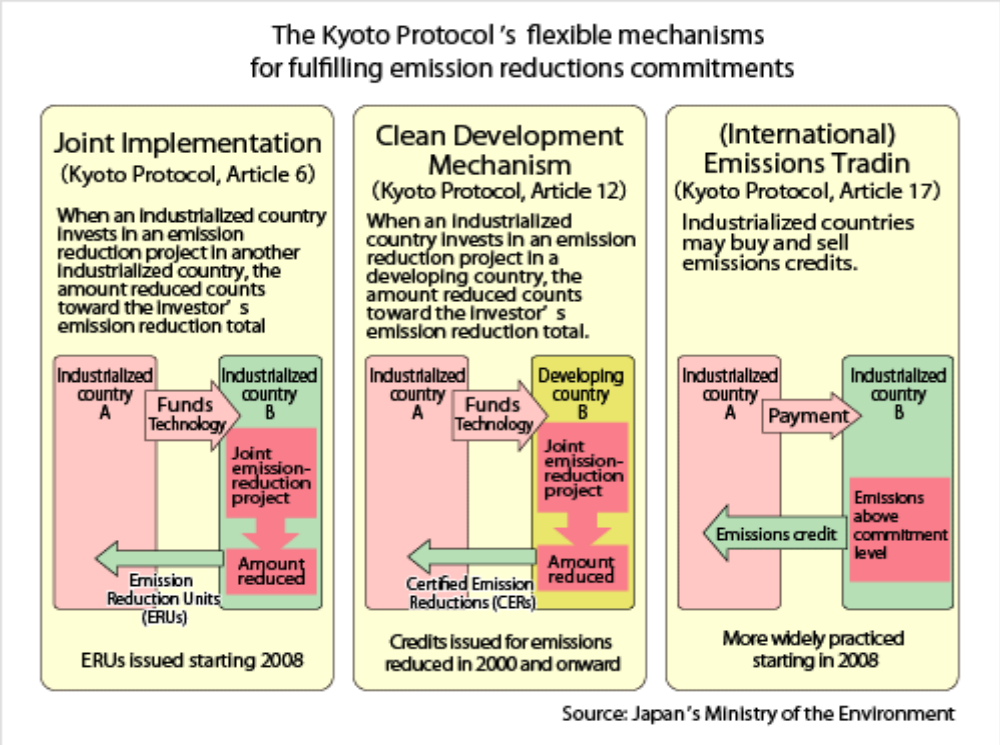
The Kyoto mechanisms are:

1) International Emissions Trading [Article 17]
2) Clean Development Mechanism (CDM) [Article 12]
3) Joint implementation (JI) [Article 6]

These mechanisms help to stimulate green investment and help Parties meet their emission targets in a cost-effective way.

These mechanisms are introduced in the Protocol with a **two fold aim:**

- **To aid Annex I countries to meet their emissions reduction and limitation commitments.**
- **To offer support for sustainable development in developing countries, non-Annex I countries, through the transference of clean technologies.**



Features of the Kyoto mechanisms as defined in the Kyoto Protocol.

Article	*Mechanism*	*Units*	*Participants*	*Requirements*
17	Emissions trading (ET)	Assigned amounts units (AAU)	Annex I Parties	Any trading shall be supplemental to domestic actions.
6	Transfer or acquire emissions reduction units resulting from projects (JI)	Emissions reduction units (ERU)	Annex I Parties and legal entities authorized by Parties	Emissions reductions must be: Approved by the Parties involved; additional to measures that would have otherwise been implemented; acquired only by Parties that comply with their reporting obligations; and supplemental to domestic action.
12	Acquire certified emission reductions from projects in non-Annex I Parties from 2000 and onwards (CDM)	Certified emissions reductions (CER)	Annex I Parties buy, non-Annex I Parties sell	Supervised by an executive board; emissions reductions will be certified by operational entities designated by the COP/MOP. [5]
			Private and/or public entities	A share of the proceeds of certified project activities shall cover administrative costs as well as assist particularly vulnerable developing countries with adaptation.

1. International Emissions Trading (IET)

- Under this mechanism, an Annex I Party may transfer Kyoto units to or acquire units from another Annex I Party.
- Emissions trading does not affect the total assigned amount of Annex I Parties collectively; rather, it re-distributes the assigned amount among them.
- A Party may acquire an unlimited number of units.
- The number of units that a Party may transfer to other Parties is limited by the Party's commitment period reserve (CPR).
- The CPR is the minimum level of units that a Party must hold in its national registry at all times. The requirement for each Party to maintain a CPR prevents a Party from over-transferring units, and thus impair its ability to meet its commitments

2. Joint implementation (JI)

- It is a project-based mechanism by which one Annex I Party can invest in a project that reduces emissions or enhances sequestration in another Annex I Party, and receive credit for the emission reductions or removals achieved through that project.
- The unit associated with JI is called an emission reduction unit (ERU).
- The total projected emission savings from JI by 2012 are about one tenth that of the CDM.
- Russia accounts for about two-thirds of these savings, with the remainder divided up roughly equally between the Ukraine and the EU's New Member States.

3. Clean Development Mechanism

- CDM credits may be generated from emission reduction projects or from afforestation and reforestation projects in non-Annex I Parties.
- Unlike emissions trading and JI, projects under the CDM create new Kyoto units and their acquisition by Annex I Parties increases both the total assigned amount available for those Annex I Parties collectively and their allowable level of emissions.
- CDM projects result in three types of Kyoto units.
  - Certified emission reductions (CERs) are issued for projects that reduce emissions
  - Temporary CERs (tCERs)
  - Long-term CERs (lCERs) both of which may be issued for projects that enhance removals through afforestation and reforestation projects.

MONITORING EMISSION TARGETS

- Under the Protocol, countries' actual emissions have to be monitored and precise records have to be kept of the trades carried out.
- Registry systems track and record transactions by Parties under the mechanisms. The UN Climate Change Secretariat, based in Bonn, Germany, keeps an international transaction log to verify that transactions are consistent with the rules of the Protocol.
- Reporting is done by Parties by submitting annual emission inventories and national reports under the Protocol at regular intervals.
- A compliance system ensures that Parties are meeting their commitments and helps them to meet their commitments if they have problems doing so.

Adaptation:

- The Kyoto Protocol, like the Convention, is also designed to assist countries in adapting to the adverse effects of climate change. It facilitates the development and deployment of technologies that can help increase resilience to the impacts of climate change.
- The Adaptation Fund was established to finance adaptation projects and programmes in developing countries that are Parties to the Kyoto Protocol. In the first commitment period, the Fund was financed mainly with a share of proceeds from CDM project activities. In Doha, in 2012, it was decided that for the second commitment period, international emissions trading and joint implementation would also provide the Adaptation Fund with a 2 percent share of proceeds.

.....

Topic; S8

SLO 1: Climate Change and Carbon credit

SLO 2: Clean Development Mechanism

.....

S8 SLO 1: Climate Change and Carbon credit

S8: Climate Change

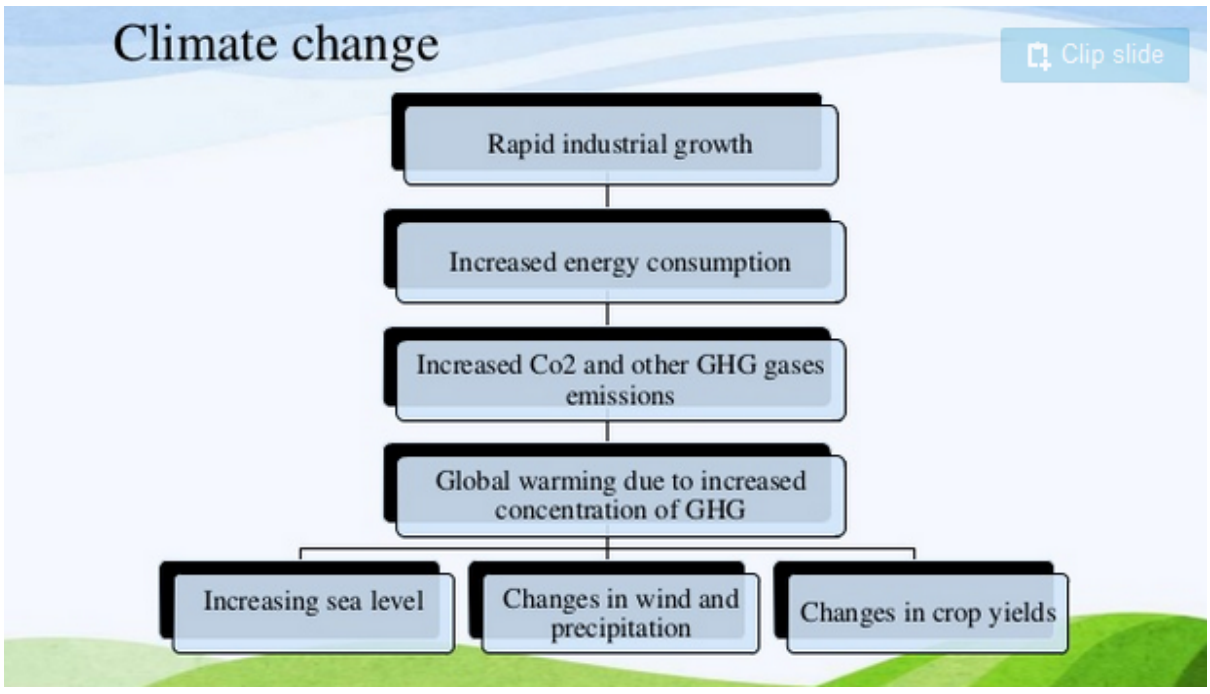
Climate Change is the defining issue of our time and we are at a defining moment. From **shifting weather patterns that threaten food production**, to rising sea levels that increase the risk of catastrophic flooding, the impacts of climate change are global in scope and unprecedented in scale. Without drastic action today, adapting to these impacts in the future will be more difficult and costly.

There are some basic well-established scientific links:

- The **concentration of GHGs** in the earth's atmosphere is directly linked to the average global temperature on Earth;
- The most abundant GHG, accounting for about **two-thirds of GHGs, carbon dioxide (CO_2),** is largely the product of burning fossil fuels.

State Indicators of Climate Change

- The anthropogenic concentrations of the greenhouse gases, and among them **carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O),** have grown significantly since pre-industrial times. These trends can be attributed to human activities, mostly fossil fuel use, land-use change and agriculture. Concentrations of other anthropogenic greenhouse gases have also increased. An increase of greenhouse gas concentrations leads on average to an additional warming of the atmosphere and the Earth's surface. Many greenhouse gases remain in the atmosphere-- and affect climate for a long time (IPCC, 1995). UNFCCC Article 4.1(a) states that:
- All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, shall develop, periodically update, publish and make available to the Conference of the Parties, in accordance with Article 12, national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties.
- **Atmospheric concentrations of CO_2, CH_4, and N_2O are key indicators** in formulating policies for mitigating the effects of climate change.



S8 : Carbon Credit: A Step Towards Green Environment

Carbon Credit Trading is generated from the **Kyoto Protocol**. The main aim of this concept is basically to trade the carbon credit in the market. This type of trading is now the one of the fastest trading market in India.. This research is used for the several benefits and challenges which are directly or indirectly associated with carbon credit trading. It is a tradable certificate or permit representing the right to emit **1 tonne of carbon di oxide.**

In today's scenario Global Warming is costing a lot of money, so Green Environmentalist aims to promote policy and business that works for the environment. As we all know, **carbon dioxide, the most important greenhouse gas** produced by combustion of fuels, has become a cause of global panic as its concentration in the Earth's atmosphere has been rising alarmingly. This has created an opportunity for the trade of carbon credits both within and outside of the regulated area, thereby creating a global "carbon market".

In this system of carbon trading, controls are imposed on **Green House Gas (GHG) emissions under the Kyoto Protocol,** and the pre-decided emission limits are then allocated across countries, which have to control the greenhouse gas emissions from the various industries and commercial units operating within them.

What Is Carbon Credit?

Carbon credits are basically an element which is used to aid in regulation of the amount of gases that are being released into the air. This is basically a larger international plan which has been created in an effort to reduce global warming and its effects. International treaties have set quotas on the amount of GHG countries can produce, which in turn set quotas for businesses. **Instruments like carbon credits and carbon offset were introduced in order to improve the scenario by encouraging firms** to be more environment friendly in conducting their business.

One carbon credit allows one tonne of carbon dioxide or a corresponding amount of other greenhouse gases to be discharged in the air.. The amount of global emissions can be controlled through the buying and selling of carbon credits in the carbon trading method. But still the increased demand flowing to carbon credits and the introduction of newer financial instruments for emission trading are all signs of heightened activity. It can also be concluded that India is an emerging leader for the developing countries in designing innovative strategies and portfolios for carbon trading.

Sectors in Which Carbon Credits Can Work?

There are several sectors in which carbon credits work as shown in figure.

Energy Supply
Transport
Residential and Commercial Buildings
Industry
Agriculture
Forestry
Waste management

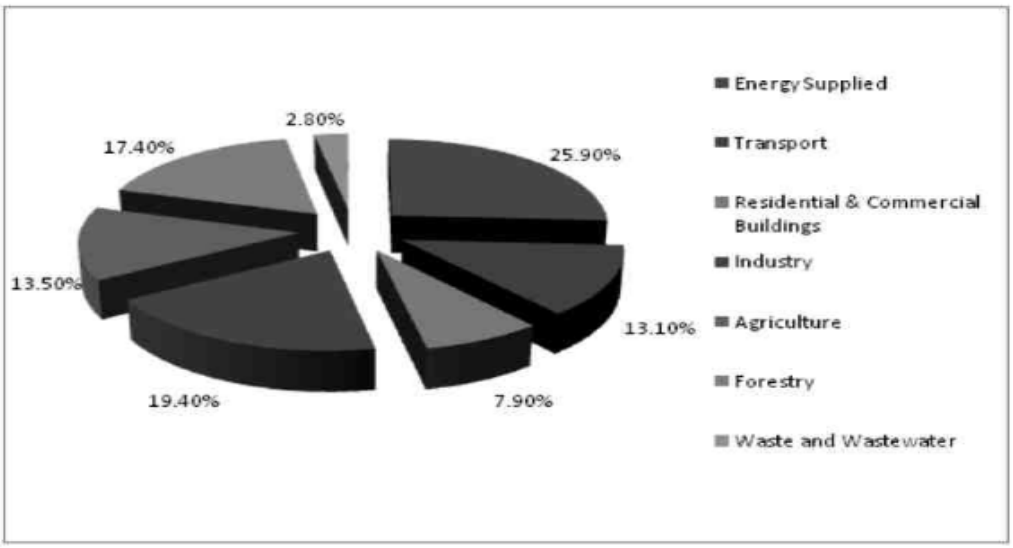
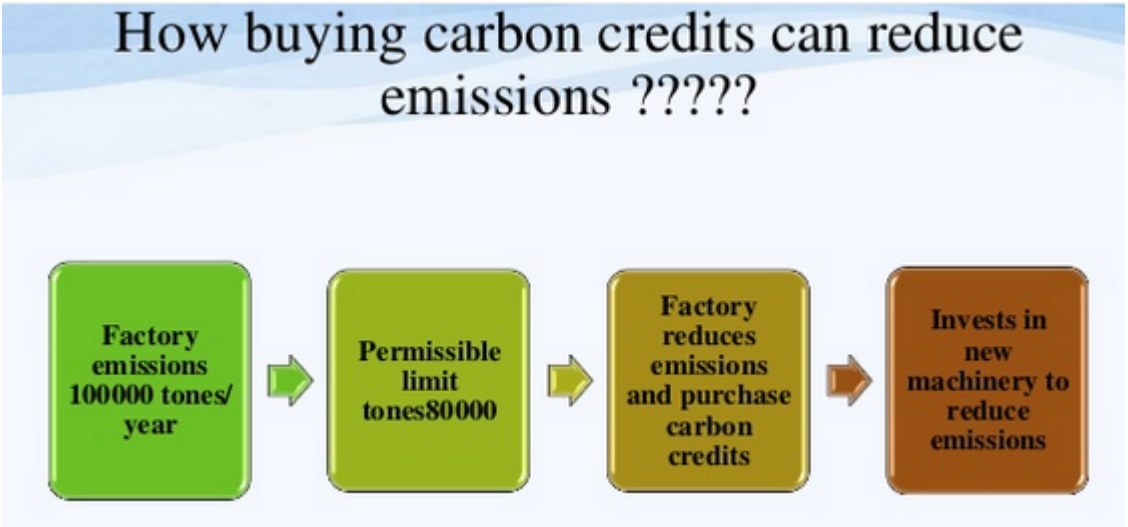


Fig. Different Sectors in which Carbon Credit Works with Percentage

How buying carbon credits can reduce emissions?



Reducing carbon emissions

i. Use of renewable energy such as wind farms, installation of solar.
ii. Afforestation

iii. Reforestation
iv. It is also duty of each individual to contribute the following
    - Drive less
    - Use solar energy
    - Plant more tress
    - Turn off electronic devices
    - Reuse and recycle.

Carbon credits in India

India signed the **kyoto protocoal in August 2002.**

India is the second largest seller of carbon credits globally with **489 CDM projects.**

Merits and demerits of carbon credits

Merits of carbon credits	De merits of carbon credits
Technology trasfer from developed to developing countries Better technology for company Can change country's financial situation Development of Cleaner technologies Environmental benefits Helps in developing extra income	Gives false sense of pollution It is not regulated Developed countries purchase CER's rather than finding new ways to reduce emissions Lack of comprehensive and structured international system.

.....

S8: SLO2: Clean Development Mechanism (CDM)

Clean Development Mechanism (CDM)

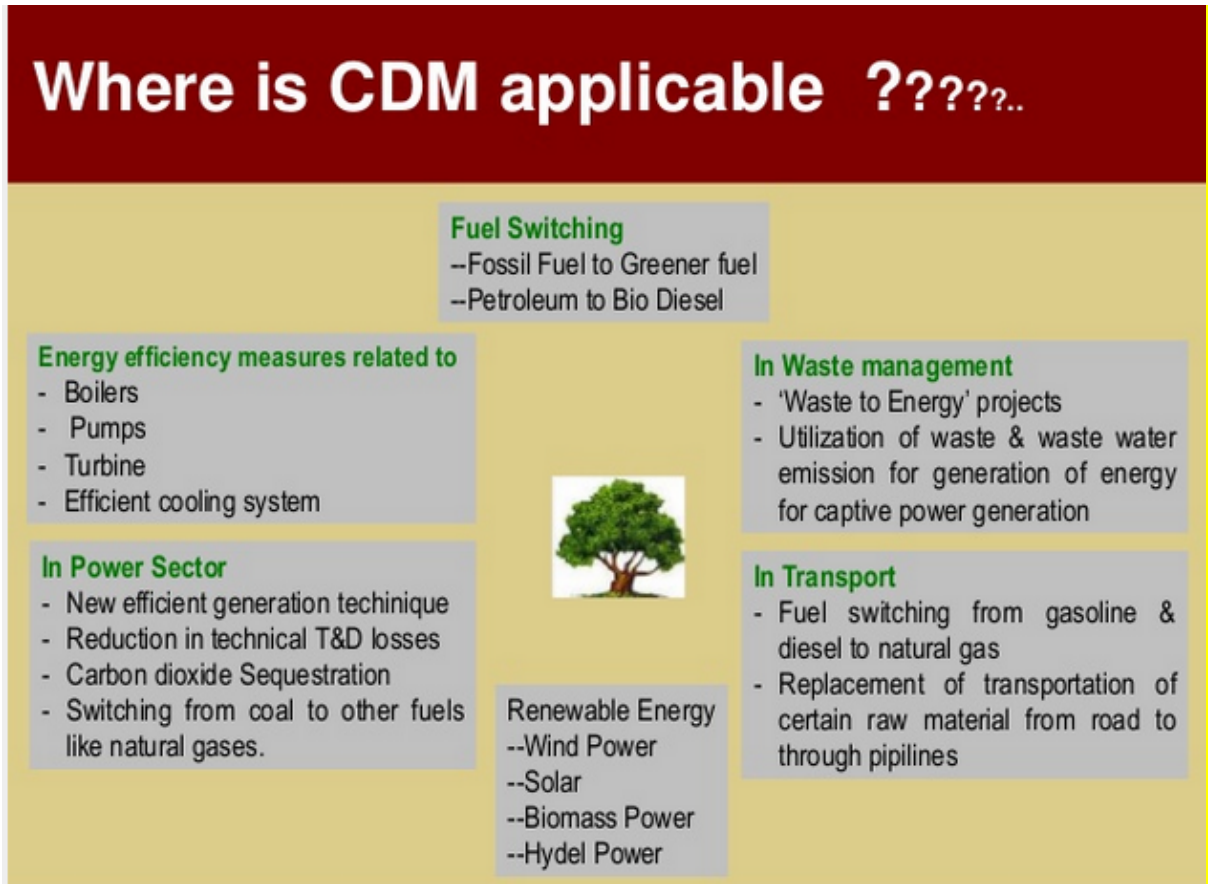
- A mechanism that allows Annex B Countries to undertake GHG emission reduction projects in non-annex B countries, and to use the achieved emission reductions to meet their own emission goal. The Clean Development Mechanism (CDM), defined in **Article 12 of the Protocol**, allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol **(Annex B Party)** to implement an emission-reduction project in developing countries. Such projects can earn saleable **certified emission reduction (CER)** credits, each equivalent to one tonne of CO_2, which can be counted towards meeting Kyoto targets.
- It is the first global, environmental investment and credit scheme of its kind, providing a standardized emissions offset instrument, CERs.
- A CDM project activity might involve, for example, a rural electrification project using solar panels or the installation of more energy-efficient boilers.
- The mechanism stimulates sustainable development and emission reductions, while giving industrialized countries some flexibility in how they meet their emission reduction or limitation targets.

Annex B: A list in the Kyoto Protocol of 38 countries plus the European Community that agreed to QELRCs (emission targets), along with the Quantified Emission Limitation and Reduction Commitment (QELRCs) they accepted. The list is nearly identical to the Annex I Parties listed in the Convention except that it does not include Belarus or Turkey.

Two main goals of CDM

i. To assist countries **without emissions targets (i.e developing countries)** in achieving sustainable development.
ii. To help those countries **with emission reduction targets under Kyoto (i.e developed countries)** in achieving compliance by allowing them to purchase offsets created by CDM projects.

Where CDM will be applicable?



Operating details of the CDM

- A CDM project must provide emission reductions that are additional to what would otherwise have occurred. The projects must qualify through a rigorous and public registration and issuance process. Approval is given by the Designated National Authorities. Public funding for CDM project activities must not result in the diversion of official development assistance.
- The mechanism is overseen by the CDM Executive Board, answerable ultimately to the countries that have ratified the Kyoto Protocol.
- Operational since the beginning of 2006, the mechanism has already registered more than 1,650 projects and is anticipated to **produce Certified Emission Reductions (CERs) amounting to more than 2.9 billion tonnes of CO_2 equivalent in the first commitment period of the Kyoto Protocol, 2008–2012**

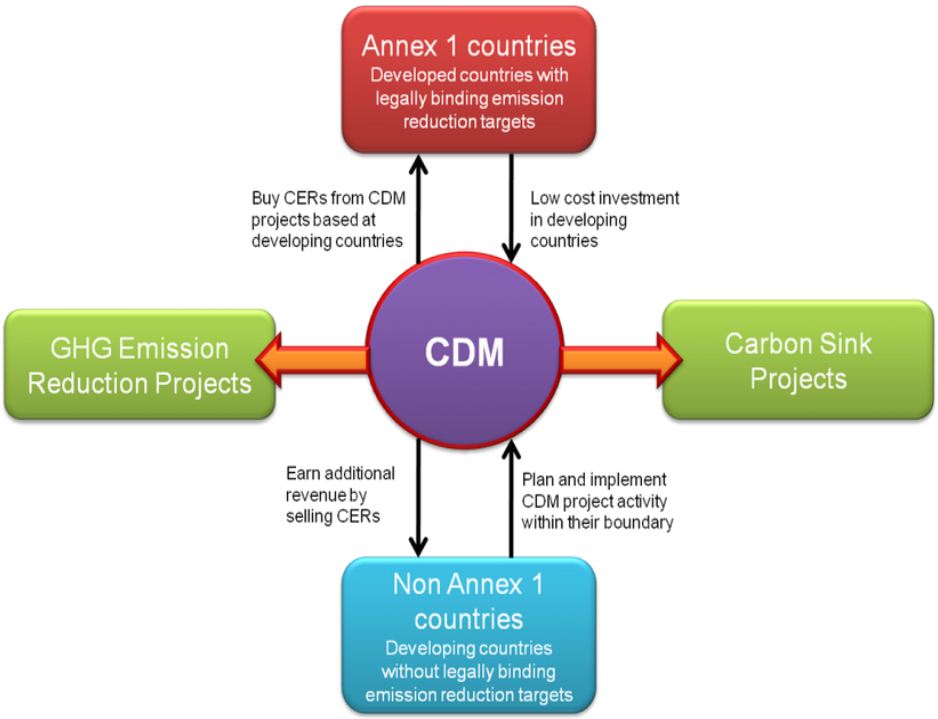


Fig: CDM Mechanism

Article 6 lay the foundation of a new mechanism different from JI and CDM

CDM and Joint Implementation [JI]were created to reach countries' commitments of GHG emission reduction. CDM allows developed countries to generate certified emission reduction (CER) emitted thanks to a mitigation project in developing countries. JI is very similar but includes mitigation outcomes transfers between Annex I countries.

CDM PROJECT CYCLE

The Designated National Authority in India is the National Clean Development Mechanism Authority (NCDMA). The Chairperson of the NCDMA is the Secretary of Environment and Forests. The NCDMA meets once per month to review project proposals, evaluating them on the probability of success and the extent to which they meet sustainable development objectives

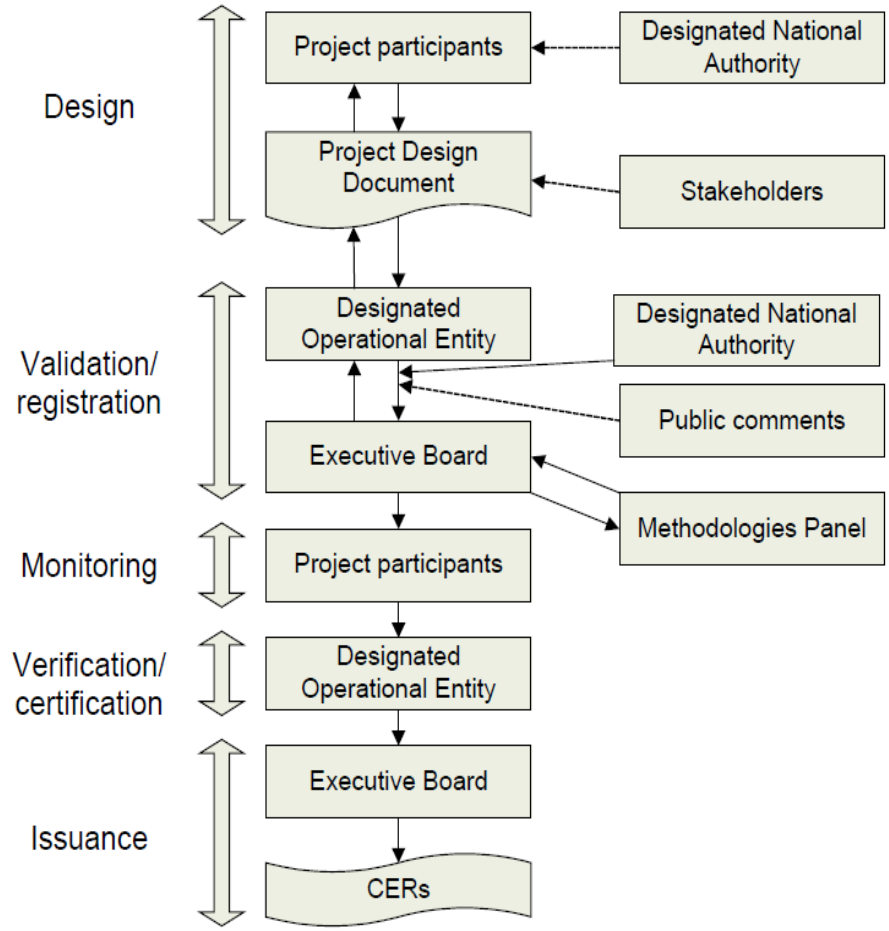


Fig: Project cycle of CDM

CDM Benefits for industrialized and developing countries.

CDM benefits for industrialized and developing countries

- Industrialized Countries
  - CDM emission reductions count towards the GHG emissions targets of the Kyoto Protocol.
  - Lower cost for GHG emissions reductions in developing countries than in industrialized countries.
  - Opportunities to market new technologies in developing countries.
- Developing countries
  - CDM projects generate sustainable development benefits (for example sustainable energy and poverty reduction).
  - Transfer of technologies to achieve sustainable development
  - Additional financial assistance for sustainable development

Disadvantages of CDM

- Concerns have also been raised regarding the conduct of project owners, with certain CDM projects implicated in land rights issues and human rights abuses.
- Meanwhile, the geographical distribution of CDM projects, over 80% of which originate in China and India, calls into question the ability of the CDM to drive broad engagement with sustainable development across developing countries.
- What's more, critics would suggest a more fundamental flaw in the CDM is that it is impossible to prove the 'additionality' of a project in comparison to a hypothetical baseline.

.....

S9: TOPIC

SLO 1: UNFCCC and India

SLO 2: MONTREAL PROTOCOL

.....

SLO 1: UNFCCC and India

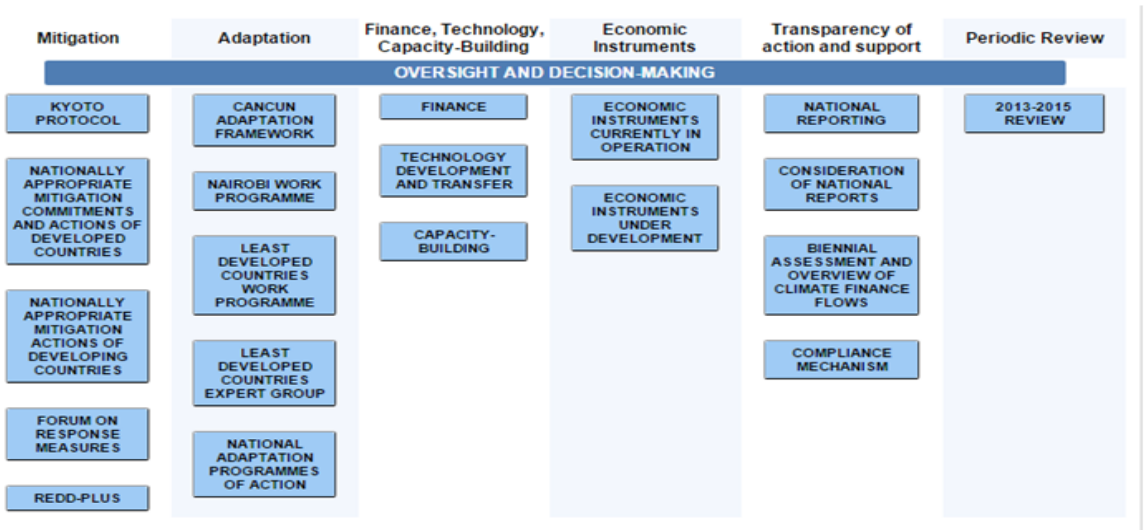
The UNFCCC **[United Nations Framework Convention on Climate Change]** is a framework Convention which aims to limit the level of climate change. The UNFCCC is a framework Convention which focuses on promoting cooperation by means of systematic observations, research and information exchange on the effects of human activities on climate, and adopting legislative or administrative measures against activities likely to have adverse effects. Climate change is a complex problem, which, although environmental in nature, has consequences for all spheres of existence on our planet. It either impacts on or is impacted by global issues, including poverty, economic development, population growth, sustainable development and resource management. The **(UNFCCC)** is an international environmental treaty negotiated at the Earth Summit in Rio de Janeiro from 3 to 14 June 1992, then entered into force on 21 March 1994.

The main objective of UNFCCC is to **"stabilize greenhouse gas concentrations in the atmosphere** at a level that would prevent dangerous anthropogenic interference with the climate system One of the first tasks set by the UNFCCC was for signatory nations to establish national greenhouse gas inventories of greenhouse gas (GHG) emissions and removals, which were used to create the 1990 benchmark levels for accession of Annex I countries to the Kyoto Protocol and for the commitment of those countries to GHG reductions.

UNFCCC Members

1) **Annex 1 countries** Developed Nations and Nations with Economies in Transition (EIT)
2) **Annex II Countries** These are Annex I countries without the countries with Economies in Transition (EIT).
3) **Non-annex I countries** Developing countries

Action of UNFCCC



The UNFCCC secretariat supports all institutions involved in the international climate change negotiations, particularly the **Conference of the Parties (COP),** the Conference of the Parties serving as the **meeting of the Parties (MOP)** The question of what happens beyond 2020 was answered by Parties in Durban in 2011.

At the very heart of the response to climate change, however, lies the need to reduce emissions. In 2010, governments agreed that emissions need to be reduced so that global temperature increases are limited to below 2 degrees Celsius.

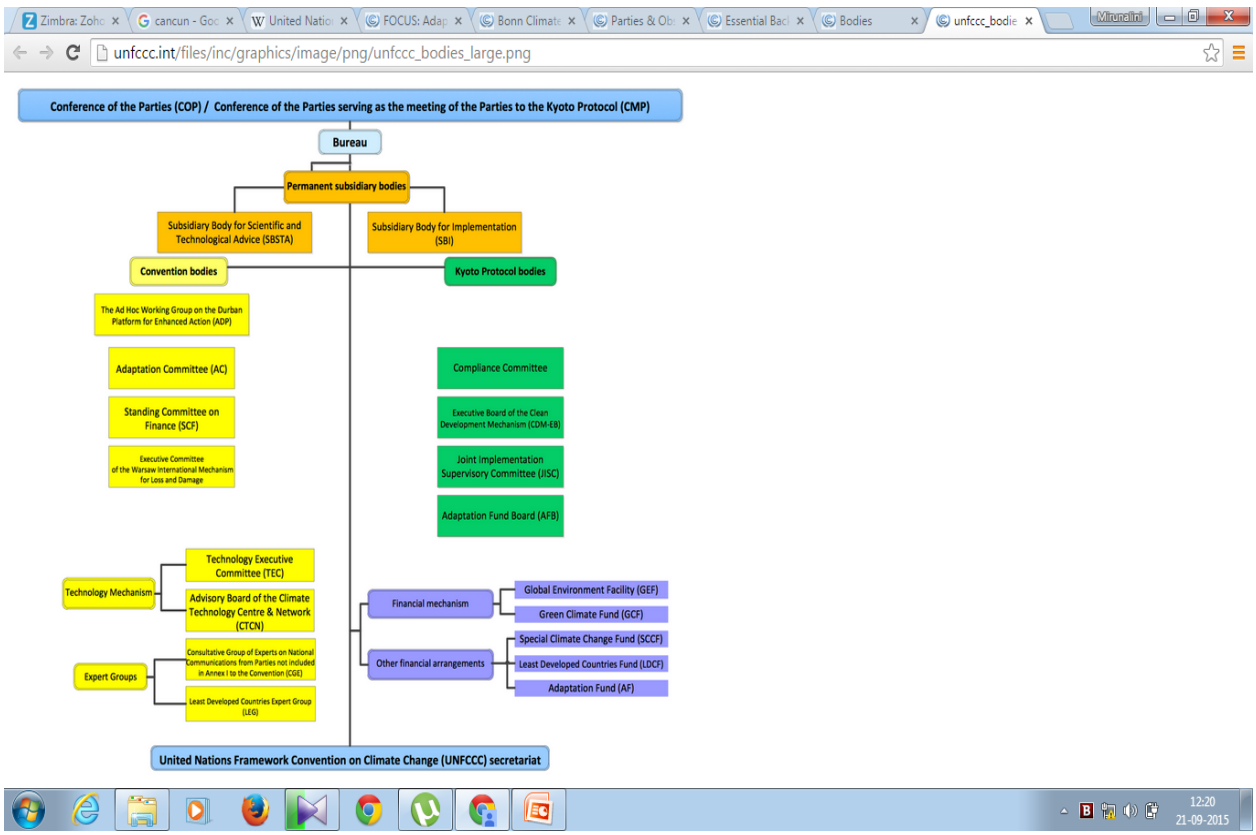
In 1992, countries joined an international treaty, the United Nations Framework Convention on Climate Change, to cooperatively consider what they could do to limit average global temperature increases and the resulting climate change, and to cope with whatever impacts were, by then, inevitable.

By 1995, countries realized that emission reductions provisions in the Convention were inadequate. They launched negotiations to strengthen the global response to climate change, and, two years later, adopted the Kyoto Protocol. The Kyoto Protocol legally binds developed countries to emission reduction targets. The Protocol's first commitment period started in 2008 and ended in 2012. The second commitment period began on 1 January 2013 and will end in 2020.

There are now

195 Parties to the Convention and

192 Parties to the Kyoto Protocol.



S9 : SLO 2: MONTREAL PROTOCOL

- The **Montreal Protocol on Substances that Deplete the Ozone Layer** (a protocol to the Vienna Convention for the Protection of the Ozone Layer) is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion.
- It was developed under the management of **UNEP [United Nations Environment Programme]** on 16 September 1987, and entered into force on 1 January 1989, followed by a first meeting in Helsinki, May 1989. Since then, it has undergone eight revisions, in 1990 (London), 1991 (Nairobi), 1992 (Copenhagen), 1993 (Bangkok), 1995 (Vienna), 1997 (Montreal), 1998 (Australia), 1999 (Beijing) and 2007 (Montreal).
- The **Montreal Protocol and Vienna convention frame work aggrement from which protocol was born were the first global aggrements to protect the earth's atmosphere.**
- International treaty ratified in 1987 in which 180 signatory nations agrred to **restrict production of chloroflurocarbon [CFC]** inorder to forestall stratospheric ozone depeltion. Because of its effectiveness in decreasing global CFC emissions, the **Montreal protocol is considered the most successful effort to date in addressing a global environment problem.**
- As a result of the international agreement, the ozone hole in Antarctica is slowly recovering. Climate projections indicate that the ozone layer will return to 1980 levels between 2050 and 2070.
- Due to its widespread adoption and implementation it has been hailed as an example of exceptional international co-operation, the single most successful international agreement to date has been the Montreal Protocol".
- In comparison, effective burden sharing and solution proposals mitigating regional conflicts of interest have been among the success factors for the Ozone depletion challenge, where global regulation based on the Kyoto Protocol has failed to do so.
- In case of the **ozone depletion** challenge, there was global regulation already being installed before a scientific consensus was established. As well in comparison, lay people and public opinion were more convinced about possible imminent risks.

- The two ozone treaties have been ratified by **197 parties,** which includes 196 states and the European Union, making them the first universally ratified treaties in United Nations history.

Terms and purposes

- The treaty is structured around several groups of halogenated hydrocarbons that have been shown to play a role in ozone depletion.
- All of these ozone depleting substances contain either chlorine or bromine (substances containing only fluorine do not harm the ozone layer).
- For each group, the treaty provides a timetable on which the production of those substances must be shot out and eventually eliminated.

Scope of Protocol

The Montreal Protocol is an international agreement adopted in 1987 to control the production and consumption of specific man-made chemicals that destroy the ozone layer, the earth's protective shield. An agreement /mechanism to reduce and eliminate the production and consumption of ODS Developed and developing countries have different phase out schedules

INDIA'S COMMITMENT TO THE MONTREAL PROTOCOL

i. 19th June 1991 : India became a Party to the Vienna convention.
ii. 17th September 1992 : India became a Party to the Montreal Protocol and ratified the London Amendment.
iii. 3rd March 2003 : India ratified Copenhagen Amendment (1992), Montreal Amendment (1997) and Beijing Amendment (1999).
iv. November 1993 : India's Country Programme was prepared.
v. January 2006 : India's Country Programme was updated.

MONTREAL PROTOCOL – Prevention of OZONE Depletion

The Montreal Protocol is designed to protect the ozone layer by phasing out the production of **ODS (Ozone Depleting Substances),** Chemicals that potentially deplete the ozone layer.

Gases considered in terms of **Ozone Depletion Potential (ODP):**

The ODP is based on the **amount of chlorine** which is released by the refrigerant as it degrades.

Reference ODP is for CFC R11 (also known as Freon-11, CFC-11, or R-11)

which is taken as 1.

Most of refrigerants are strong GHG emissions and thus limitation of ODS will help climate change as well.

Without the Montreal Protocol by 2050

Ozone depletion would have reached to at least 50 % in the northern hemisphere's mid latitudes 70% in the southern mid latitudes.

Doubling on the UV-B radiation reaching earth's surface.

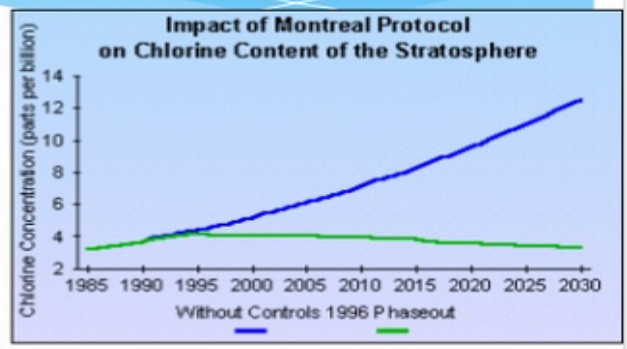
Estimated increases of 19 million more cases of non-melanoma cancer 1.5 million more cases of melanoma cancer 130 million more eye cataracts

Montreal Protocol

- Signed 16 September 1987
- Location Montreal
- Effective 1 January 1989 if 11 states have ratified by then
- Condition ratification by 20 states
- Signatories 46
- Ratifiers 197 (all United Nations members, as well as Niue, the Cook Islands, the Holy See and the European Union)
- Depositary Secretary-General of the United Nations
- Languages Arabic, Chinese, English, French, Russian and Spanish.

Results to date

- The Montreal Protocol is working. There is clear evidence of a decrease in the atmospheric burden of ozone-depleting substances in the lower atmosphere and in the stratosphere;
- Some early signs of the expected stratospheric ozone recovery are also evident.
- Furthermore, if the Parties were to eliminate all emissions of ozone depleting substances soon after 2006, it would advance by about 15 years (from around 2050 to 2035) the global ozone layer recovery to pre-1980 levels



.....