CLIMATE CHANGE MITIGATION AND ITS IMPORTANCE FOR PROFESSIONALS AND BUSINESS

Contents

INTRODUCTION

The Threat to the environment, posed by the global climate change is real. Human activities are increasing the atmospheric concentrations of greenhouse gases. All theoretical models predict that these increases in greenhouse gas concentrations will cause changes in climate, both regionally and globally -- with adverse consequences likely for human health, as well as to ecological and socio-economic systems.

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 devil, however, is now turning into a product that helps people, countries, consultants, traders, corporations and even farmers earn billions of rupees while in turn benefiting the environment. This was an unimaginable trading opportunity not more than a decade ago. Carbon credits can form a massive source of revenue for the developing world.

Over a decade ago, most countries joined an international treaty to address the danger of global climate change. The United Nations Framework Convention on Climate Change (UNFCCC) is an international environmental treaty that sets

general goals and rules for confronting climate change. The UNFCCC provides the basis for concerted international action to mitigate climate change and to adapt to its impacts. Its provisions are far-sighted, innovative and firmly embedded in the concept of sustainable development.

With 195 Parties, the United Nations Framework Convention on Climate Change (UNFCCC) has near universal membership and is the parent treaty of the 1997 Kyoto Protocol. The Kyoto Protocol, an addition to the UNFCCC treaty, has been ratified by 193 of the UNFCCC Parties. Under the Protocol, 37 States, consisting of highly industrialized countries and countries undergoing the process of transition to a market economy, have legally binding emission limitation and reduction commitments.
The ultimate objective of both treaties is to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system.

The clean development mechanism (CDM) allows emission-reduction projects in developing countries to earn certified emission reductions (CERs), each equivalent to one tonne of CO2. CERs can be traded and sold, and used by industrialized countries to meet a part of their emission reduction targets under the Kyoto Protocol. With more than 4,500 registered projects in 75 developing countries, the CDM has proven to be a powerful mechanism to deliver finance for emission-reduction projects and contribute to sustainable development.

The greenhouse emission reduction credit or "carbon credit" market has become a multi-billion dollar industry for credits issued under the Kyoto Protocol internationally. India is being heralded as the next carbon credit destination of the world. On 7th September 2012, the one billionth CER credit under the Kyoto Protocol's Clean Development Mechanism (CDM) was issued to a project at a manufacturing plant in India that has switched its fuel source from coal and oil to locally gathered biomass.

LEGISLATIONS REGULATING CARBON CREDITS MECHANISM

The UNFCCC was adopted at the United Nations Headquarters, New York on the 9 May 1992. In accordance with Article 20, it was open for signature at Rio de Janeiro from 4 to 14 June 1992, and thereafter at the United Nations Headquarters, New York, from 20 June 1992 to 19 June 1993.
Pursuant to Article 22, the Convention is subject to ratification, acceptance, approval or accession by States and by regional economic integration

organizations. States and regional economic integration organizations that have not signed the Convention may accede to it at any time.

The Convention entered into force on 21 March 1994. Currently, there are 195 Parties (194 States and 1 regional economic integration organization) to the United Nations Framework Convention on Climate Change.

The Kyoto Protocol is an international and legally binding agreement to reduce greenhouse gas emissions worldwide and is an addition to the UNFCCC treaty.

The Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) was adopted at the third session of the Conference of the Parties (COP 3) in Kyoto, Japan, on 11 December 1997. In accordance with Article 24, it was open for signature from 16 March 1998 to 15 March 1999 at United Nations Headquarters, New York. Pursuant to Article 22, the Protocol is subject to ratification, acceptance, approval or accession by Parties to the UNFCCC. Parties to the UNFCCC that have not signed the Protocol may accede to it at any time.

The Protocol entered into force on 16 February 2005 and currently, there are 193 Parties to the Kyoto Protocol to the UNFCCC.

India signed UNFCCC on 10th June 1992 and ratified it on 1st November 1993. India acceded to the Kyoto Protocol on 26th August 2002. Under the UNFCCC, developing countries such as India do not have binding GHG mitigation commitments in recognition of their small contribution to the greenhouse problem as well as low financial and technical capacities.

The Ministry of Environment and Forests, Government of India, is the nodal agency for climate change issues in India.

OPPORTUNITIES FOR PROFESSIONALS AND BUSINESS IN THE CLIMATE CHANGE INDUSTRY

In today's increasingly challenging and volatile macro world, the role of the Chief Executive Officers (CEO's) and Chief Financial Officers (CFO's) of their companies has also evolved significantly. Their roles have expanded and evolved as strategic partners and advisors. The Key Personnel of an organization perform four main functions of Steering, Operating, Motivating and Planning, - they are in the best position to guide their organizations in shifting their business models towards adherence with the climate change agenda.

Organizations also stand to gain from environment protection and sustainable development. New business can be started as green businesses. Credits can be earned under the Clean Development Mechanism of the United Nations Framework Convention on Climate Change, thereby benefiting the Organisation and the Environment as a whole.

Professional Opportunities in the Climate Change industry include:

1. Conceptualizing the Clean Development Mechanism (CDM) project
2. Quantification of greenhouse gases (GHG) Carbon Footprint
3. Selection of Cleaner technologies for New projects
4. Project risk analysis
5. Registration of project - both national and international level
6. Obtaining Host country approval
7. Preparation of Project Concept Note
8. Preparation of Project Design Document
9. Selection of Methodologies and Baseline
10. Legal and regulatory advice during negotiations with host country Designated National Authority (DNA)
11. Advice on the appointment of independent validators
12. Assistance to achieve registration of the project by the CDM Executive Board
13. Assistance in getting verification done by Designated Operational Entity (DOE)
14. Ensure Compliances
15. Assisting various Ministries associated with National Action Plan on Climate Change (NAPCC)
16. Carbon Finance
17. Energy Audit under The Energy Conservation Act 2001
18. Advise on investment in carbon credit
19. Accounting advisory services
20. Taxation advisory services

Professional Opportunities in Environmental Laws and Green Sectors:

1. Professionals as consultants can obtain consents for establishment of a Unit under the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981.

2. Before establishing an industrial unit a certificate from a professional about proposed Capital Investment or Gross capital investment (Land, building, plant and machinery) is required to be submitted along with the consent application for establishment of a Unit. This certificate is also known as Gross Block investment certificate. This certificate should include the cost of land, building, plant and machinery without depreciation.

3. Professionals as environment consultants can play an important role in obtaining environmental clearance under the Environment Impact Assessment Notification. The environmental consultant should be conversant with the existing legal and procedural requirements of obtaining environmental clearance for a proposed project. The consultant should guide the project proponent (i.e the person who is going to establish an industrial unit) through initial screening of the project and establish whether Environment Impact Assessment (EIA) studies are required to be conducted and if so finalise the scope of such study. The consultant should also be fully equipped with required instruments and infrastructure for conducting EIA studies. The environmental consultant is responsible for supplying all the environment-related information required by the State Pollution Control Board (SPCB) and Impact Assessment Agency (IAA) through the project proponent. The consultant is also required to justify the findings in the Environment Impact Assessment and Environmental Management Plan (EMP) during the meeting with the expert groups at IAA.

4. Professionals can also assist the Industrial Units in record keeping of various hazardous wastes, chemicals etc, as prescribed under the Hazardous Wastes (Management and Handling) Rules, 1989 and Manufacture, Storage, and Import of Hazardous Chemicals Rules, 1989.

5. Professionals can also provide information on the capital and recurring (O&M) expenditure on various aspects of environment protection such as effluent, emission, hazardous wastes, solid wastes, tree-plantation, monitoring, data acquisition etc. This is important information to be given in the application for consent to establish/operate/renewal of consent.

6. Status of compliance of Rules 5, 7, 10,11,12,13 and 18 under the Manufacture, Storage, and Import of Hazardous Chemicals Rules, 1989 need to be given in the application for consent to establish/operate/renewal of consent. This status of compliance can be given by a professional in the form of a certificate of compliance.

a. Rule 5 – Notification of major accident

b. Rule 7 – Notification of sites

c. Rule 10 – Preparation and submission of safety report

d. Rule 11 – Updation of safety report

e. Rule 12 – Requirements of further information to given to the authority

f. Rule 13 – Preparation of on-site emergency plan by the occupier

g. Rule 18 – Import of hazardous chemicals

7. After consent to establish/operate is obtained under the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981, professionals can ensure on a monthly/quarterly/half-yearly basis that the conditions of the consent order are complied with by the industrial unit.

8. In the same manner professionals can also ensure on a monthly/quarterly/half-yearly basis that the conditions of the authorization are complied by the industrial units under the Hazardous Wastes (Management and Handling) Rules, 1989.

9. Professionals can give a report or certificate with regard to capital investment under the Biomedical waste (Management and Handling) Rules, 1998. This is an important document to be submitted along with the application for authorization.

10. Professionals as environmental consultants can give opinion on - viability of various projects, technologies to prevent pollution and clean up polluted resources.

11. Environmental audits can be conducted by Professionals. Environmental auditing refers to the monitoring of environmental management system of the Unit, checking the status of consent orders, compliance of consent orders, water cess, other legal requirements, industrial data collection regarding product process, electric consumption, water consumption, raw materials and energy balance etc.

CLIMATE CHANGE AND GLOBAL WARMING

Public awareness of the threat of climate change has risen sharply in the last couple of years and an increasing number of businesses, organizations and individuals are looking to minimize their impact on the climate.

Scientists believes that global warming will cause the average World temperature rise by one Degree Celsius by the year 2020 and four Degree Celsius by the end of 21st century. The Earth has warmed about 1^{o}F in the last 100 years. The eight warmest years on record (since 1850) have all occurred since 1998. Periods of increased heat from the sun may have helped make the Earth warmer. But many of the world's leading climatologists think that the greenhouse gases people produce are making the Earth warmer, too.

The Earth's Atmosphere, Greenhouse Gases and the Greenhouse Effect

The planet Earth supports life because of some unique environmental conditions that are present: water, an oxygen-rich atmosphere, and a suitable surface temperature.

The Earth's atmosphere consists of a layer of gases surrounding the planet Earth that is retained by the Earth's gravity. The chemical composition of the atmosphere is responsible for nurturing life on our planet.

The Earth has a natural temperature control system. The Earth's atmosphere carries out the critical function of maintaining life-sustaining conditions on Earth. The mixture of gases in the atmosphere protects life on Earth by absorbing ultraviolet solar radiation and reducing temperature extremes between day and night.

The Greenhouse Effect is the process by which the gases make the Earth warmer by trapping energy in the atmosphere. Greenhouse gases (GHGs) re-emit some of this heat to the earth's surface. Without the natural greenhouse effect, the average temperature at Earth's surface would be below the freezing point of water. An increase in the levels of GHGs could lead to greater warming, which, in turn, could have an impact on the world's climate, leading to the phenomenon known as climate change.

Greenhouse gases are the gases present in the earth's atmosphere which reduce the loss of heat into space and therefore contribute to global temperatures through the greenhouse effect. The CO2 equivalence of a particular gas, when integrated over a time horizon of 100 years, is referred to as its Global Warming Potential (GWP).

The Kyoto Protocol is an international and legally binding agreement to reduce greenhouse gas emissions worldwide. The Kyoto Protocol covers six greenhouse gases - carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O),

hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6).

Climate Change

Climate change represents a change in long-term weather patterns. It may be due to natural internal processes or external forcings, or due to persistent anthropogenic changes in the composition of the atmosphere or in land use. These changes can be caused by dynamic processes on Earth, external forces including variations in sunlight intensity, and more recently by human activities.

The Earth's atmosphere does not respond as an isolated system. Like the atmosphere, the thermodynamic state of the oceans is determined by the transfer of heat, momentum and moisture to and from the atmosphere. The global climate system is a consequence of and a link between the atmosphere, oceans, the ice sheets (cryosphere), living organisms (biosphere) and the soils, sediments and rocks (geosphere).

Climate models use quantitative methods to simulate the interactions of the atmosphere, oceans, land surface, and ice.

Global Warming

Global warming refers to an increase in the Earth's average temperature, which in turn causes changes in climate. A warmer Earth may lead to changes in rainfall patterns, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans. When scientists talk about the issue of climate change, their concern is about global warming caused by human activities.

Many people use the terms "climate change" and "global warming" interchangeably. But there are differences between the meanings of the two terms. Global Warming is an overall warming of the planet, based on average temperature over the entire surface. Whereas, Climate Change is changes in regional climate characteristics, including temperature, humidity, rainfall, wind, and severe weather events.

Carbon Credits

The pollution caused by the emission of greenhouse gases by industries and

anthropogenic activities have caused irreparable damage to the atmosphere giving way to rising global temperature, affecting human life thus causing Global Warming. The Concept of Carbon Credits evolved as a step to mitigate the rising Global Warming on earth. The Concept of Carbon Credits was thus evolved by way of an agreement by different countries of the world.

Carbon credits are a key component of national and international emissions trading schemes that have been implemented to mitigate global warming. They provide a way to reduce greenhouse effect emissions on an industrial scale by capping total annual emissions and letting the market assign a monetary value to any shortfall through trading.

The framework governing carbon credit is contained in the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol.

STRUCTURE OF UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (UNFCCC)

The United Nations Framework Convention on Climate Change (UNFCCC) is an international environmental treaty produced at the United Nations Conference on Environment and Development (UNCED), held in Rio de Janeiro in 1992. The Convention is the foundation of global efforts to combat global warming. The objective of the treaty is to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

The UNFCCC treaty itself sets no mandatory limits on greenhouse gas emissions for individual countries and contains no enforcement mechanisms. Instead, the treaty provides for protocols that would set mandatory emission limits. The principal update to the UNFCCC is the Kyoto Protocol.

The Convention is based on three principles –

1. Common but differentiated responsibility;
2. Precautionary approach;
3. Sustainable Economic Growth and Development.

The Convention divides countries into three main groups according to differing commitments:

a. Annex I Parties

This include the industrialized countries that were members of the OECD (Organisation for Economic Co-operation and Development) in 1992, plus countries with Economies In Transition (the EIT Parties), including the Russian Federation, the Baltic States, and several Central and Eastern European States.

b. Annex II Parties
This consist of the OECD members of Annex I, but not the EIT Parties. They are required to provide financial resources to enable developing countries to undertake emissions reduction activities under the Convention and to help them adapt to adverse effects of climate change. In addition, they have to "take all practicable steps" to promote the development and transfer of environmentally friendly technologies to EIT Parties and developing countries. Funding provided by Annex II Parties is channelled mostly through the Convention's financial mechanism.

c. Non-Annex I Parties
These are mostly developing countries. Certain groups of developing countries are recognized by the Convention as being especially vulnerable to the adverse impacts of climate change, including countries with low-lying coastal areas and those prone to desertification and drought. Others (such as countries that rely heavily on income from fossil fuel production and commerce) feel more vulnerable to the potential economic impacts of climate change response measures. The Convention emphasizes activities that promise to answer the special needs and concerns of these vulnerable countries, such as investment, insurance and technology transfer.

The 49 Parties classified as least developed countries (LDCs) by the United Nations are given special consideration under the Convention on account of their limited capacity to respond to climate change and adapt to its adverse effects. Parties are urged to take full account of the special situation of LDCs when considering funding and technology-transfer activities.

The Structure of the Convention

The text of Framework Convention is contained in 26 Articles. There are two annexure to the Convention. Annexure I contains the list of 41 developed nations. 6 of these nations have been added by an amendment that entered into force on 13 August 1998, pursuant to decision 4/CP.3 adopted at COP.3. Annexure I Parties include both the relatively wealthy countries that were members of the Organization for Economic Co-operation and Development (OECD) in 1992, as well as the Economies in Transitions (EITs), including the Russian Federation, the Baltic States, and several Central and Eastern European

States. Annex I Parties have higher per capita emissions than most developing countries. They also have greater financial and institutional capacity to address climate change, and hence they are expected to take a lead in modifying longer-term trends in emissions. Therefore, by the means of this Convention, Annex I Parties pledged to adopt national policies and measures that aim to return national GHG emissions to 1990 levels by the year 2000.
Annexure II of the Convention is a list of 24 countries, (who are also Annexure I Parties) who were OECD members in 1992. They have a special obligation to provide "new and additional financial resources" (Article 4.3) to developing countries to help them tackle climate change. They must also facilitate the transfer of climate-friendly technologies to both developing countries and Economies in Transition.

Objective of the Convention

Article 2 of the Convention sets out the objective of the Convention. According to this article, the Convention's ultimate objective is "to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic [originating in human activity] interference with the climate system". This objective is qualified in that it "should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner".

Institutional Bodies under the Convention

Various institutions and bodies work within the framework of the Convention. These include institutions and bodies established by the Convention like the Conference of the Parties to the Convention (COP), the subsidiary bodies (SBs), the Bureau and the secretariat and also other bodies established by the COP, in accordance with Article 7.2(i) of the Convention like committees, working groups and expert bodies.

The Conference of the Parties (COP)

Article 7.2 defines the COP as the "supreme body" of the Convention, as it is its highest decision-making authority. The climate change process revolves around the annual sessions of the COP, which bring together all countries that are Parties to the Convention. The COP is responsible for reviewing the implementation of the Convention and any related legal instruments, and has to

make the decisions necessary to promote the effective implementation of the Convention. COP is headed by its President. The office of the COP President normally rotates among the five United Nations regional groups. The President is usually the environment minister of his or her home country. She/he is elected by acclamation immediately after the opening of a COP session. Their role is to facilitate the work of the COP and promote agreements among Parties. The work of the COP and each subsidiary body is guided by an elected Bureau. To ensure continuity, it serves not only during sessions, but between sessions as well. The COP Bureau consists of 11 officers: the COP President, seven Vice-Presidents, the Chairs of the two subsidiary bodies and a Rapporteur. It deals mainly with procedural and organizational issues arising from the COP, and advises the President. In addition, the Bureau has other technical functions, such as examining the credentials of Party representatives and reviewing – in cooperation with the secretariat – requests for accreditation by nongovernmental organizations (NGOs) and intergovernmental organizations (IGOs).

Subsidiary Bodies (SBs)

The Convention establishes two permanent subsidiary bodies (SBs), namely the Subsidiary Body for Scientific and Technological Advice (SBSTA), by Article 9, and the Subsidiary Body for Implementation (SBI), by Article 10. These bodies advise the COP. In accordance with Articles 9.1 and 10.1, they are both multidisciplinary bodies open to participation by any Party, and governments send representatives with relevant expertise.

Subsidiary Body for Scientific and Technological Advice (SBSTA)

The SBSTA's task is to provide the COP and, as appropriate, its other subsidiary bodies "with timely advice on scientific and technological matters relating to the Convention". The following tasks are assigned to the SBSTA:

- to provide assessments of the state of scientific knowledge of climate change and its effects to the COP by reviewing the latest relevant information provided by competent bodies such as the IPCC, and evaluating its implications to the extent possible
- to prepare scientific assessments of the effects of measures taken in implementing the Convention by compiling in-depth reports on national communications, and making recommendations on technical aspects of the review process
- to identify innovative, efficient and state-of-the-art technologies and know-how and advise on how to promote their development and/or transfer by ensuring that information on them is collected and disseminated and by providing advice on them and evaluating ongoing efforts in their development and/or transfer according to need under the Convention

- to advise on scientific programmes, international cooperation in research and development and on supporting capacity-building in developing countries, and to assist the Parties in implementing Article 5 and Article 6 of the Convention, by ensuring that information on related international initiatives is collected and disseminated. In addition, to advise on education programmes, human resources and training and on the promotion of such initiatives, and to evaluate ongoing efforts in this field according to need under the Convention
- to respond to scientific, technological and methodological questions that the COP and the SBI may put to it.

Subsidiary Body for Implementation (SBI)

The SBI's task is to assist the COP "in the assessment and review of the effective implementation of the Convention". More specifically, the following tasks are assigned to the SBI:

- to consider the information communicated by all Parties in accordance with Article 12.1, in order to assess the overall aggregated effect of the steps taken in the light of the latest scientific assessments of climate change
- to consider the information communicated by Annex I Parties in accordance with Article 12.2, in order to assist the COP in carrying out the review of the adequacy of commitments.
- to assist the COP, as appropriate, in preparing and implementing its decisions

The Secretariat

The secretariat, also known as the Climate Change Secretariat, was established as per the Article 8 of the Convention. This secretariat services the COP, the SBs, the Bureau and other bodies established by the COP. Its main function includes:

- to make practical arrangements for sessions of the Convention bodies, namely the COP and its SBs
- to assist Parties, in particular developing countries, in implementing their commitments
- to provide support to negotiations and
- to coordinate with the secretariats of other relevant international bodies, notably the Global Environment Facility (GEF) and its implementing agencies (United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP) and the World Bank), the IPCC and other relevant conventions
- to prepare official documents for the COP and the SBs, coordinating in-depth reviews of Annex I Party national communications and compiling GHG inventory data

- It also carries out tasks that are specified in the programme of work that is adopted by the COP and other tasks decided by the COP.
- The secretariat also services the bodies established by the Kyoto Protocol

Other bodies

Other bodies have been set up by the COP to undertake specific tasks. These bodies report back to the COP when they complete their work. Some of the bodies established by COP are various Ad hoc groups and certain limited membership bodies. Some of the important Ad hoc group are , the Ad hoc Group on the Berlin Mandate (AGBM) , the Ad hoc Group on Article 13 (AG13), and Ad hoc working group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG). Beside these, several specialized bodies with a limited membership have been established to address specific areas, namely:

- the Expert Group on Technology Transfer (EGTT);
- the Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention (Consultative Group of Experts, or CGE); and
- the Least Developed Countries Expert Group (LEG).

These groups have been set up on an ad hoc and temporary basis. Their mandate and possible continuation is subject to review by the COP. The nature of their work is technical; their conclusions and recommendations must be reported either to the SBSTA or to the SBI.

A variety of groups of a more informal character has been set up on an ad hoc basis to move the negotiation process forward during sessions. Their existence is therefore usually limited to the session in which they were established.

Parties & Observers under the Convention

1. Parties

The Convention divides countries into three main groups according to differing commitments:

Annex I Parties

This include the industrialized countries that were members of the OECD (Organisation for Economic Co-operation and Development) in 1992, plus countries with economies in transition (the EIT Parties), including the Russian Federation, the Baltic States, and several Central and Eastern European States.

Annex II Parties

This consist of the OECD members of Annex I, but not the EIT Parties. They are required to provide financial resources to enable developing countries to undertake emissions reduction activities under the Convention and to help them adapt to adverse effects of climate change. In addition, they have to "take all practicable steps" to promote the development and transfer of environmentally friendly technologies to EIT Parties and developing countries. Funding provided by Annex II Parties is channelled mostly through the Convention's financial mechanism.

Non-Annex I Parties

These are mostly developing countries. Certain groups of developing countries are recognized by the Convention as being especially vulnerable to the adverse impacts of climate change, including countries with low-lying coastal areas and those prone to desertification and drought. Others (such as countries that rely heavily on income from fossil fuel production and commerce) feel more vulnerable to the potential economic impacts of climate change response measures. The Convention emphasizes activities that promise to answer the special needs and concerns of these vulnerable countries, such as investment, insurance and technology transfer.

The 49 Parties classified as least developed countries (LDCs) by the United Nations are given special consideration under the Convention on account of their limited capacity to respond to climate change and adapt to its adverse effects. Parties are urged to take full account of the special situation of LDCs when considering funding and technology-transfer activities.

2. Observer organizations

Several categories of observer organizations also attend sessions of the COP and its subsidiary bodies. These include representatives of United Nations secretariat units and bodies, such as UNDP, UNEP and UNCTAD, as well as its specialized agencies and related organizations, such as the GEF and WMO/UNEP Intergovernmental Panel on Climate Change (IPCC). Observer organizations also include intergovernmental organizations (IGOs), such as the OECD and its International Energy Agency (IEA), along with non-governmental organizations (NGOs).

The NGOs represent a broad spectrum of interests, and embrace representatives from business and industry, environmental groups, indigenous populations, local governments and municipal authorities, research and academic institutes,

parliaments, labour unions, faith groups, women and youth. Constituency groupings have emerged to facilitate interaction.

STRUCTURE OF THE KYOTO PROTOCOL

The Kyoto Protocol, an international and legally binding agreement to reduce greenhouse gas(GHG) emissions worldwide assigns mandatory targets for signatory nations. The Protocol is an addition to the UNFCCC treaty and has more powerful and legally binding measures. The treaty was negotiated in Kyoto, Japan on 11th December 1997, at the Third Conference of Parties (COP), hence the name 'Kyoto Protocol'. The Protocol entered into force on 16th February 2005.

Countries that ratify this Protocol agree to reduce their emission of the specified 6 greenhouse gases, or engage in emissions trading if they maintain or increase emission of these gases. The first commitment period under this Protocol starts from calendar year 2008 to calendar year end 2012.

The detailed rules for the implementation of the Protocol were adopted at COP 7 in Marrakesh in 2001, and are called the "Marrakesh Accords."

The major distinction between the Protocol and the Convention is that while the Convention encouraged industrialized countries to stabilize GHG emissions, the Protocol commits them to do so. However, to understand the Kyoto Protocol (KP), it is important to read it together with the Framework Convention on Climate Change (FCCC).

Structure of the Protocol

The text of the Kyoto Protocol comprises of a short preamble, twenty-eight Articles and two Annexure viz. Annexure A and Annexure B. Annexure A give the list of Greenhouse Gasses the emission of which is to be regulated under the Protocol. It also gives the list of sources and categories of sectors, which are significant in respect to controlling emission of GHG. Annexure B gives the name of the parties and "quantified emission limitation or reduction commitment" (QUELROS) binding upon the parties as a percentage of the base year.

Objective of the Kyoto Protocol

The preamble to the Kyoto Protocol states that the Protocol has been developed to meet the 'ultimate objective' of the FCCC as stated in its Article 2. The objective of the FCCC is "*to achieve....stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner*."

Under the Treaty, countries must meet their targets primarily through national measures. However, the Kyoto Protocol offers them an additional means of meeting their targets by way of three market-based mechanisms:
-Joint Implementation
-Clean Development Mechanism
- Emission Trading

Highlights of Kyoto Protocol

1. Important Definitions

Article 1 of the Kyoto Protocol defines the terms like conference of parties, convention, Intergovernmental Panel on Climate Change, Montreal Protocol, parties present and voting, party and party included in Annex 1. It is important to note that party refers to the party to the Kyoto Protocol whereas as Conference of Parties has been defined as Parties to the Convention.

The term ' party included in Annex 1' means a nation included in Annex 1 to the FCCC or a Party which has made a notification under Article 4, paragraph 2 (g), of the Convention. By making this notification any party though not in Annex I of the Convention may commit itself to actions specifically provided under subparagraph (a) and (b) of Article 4(2) of the FCCC. These actions described under Article 4, sub-paragraphs 2(a) and 2(b) are:

a. adoption of national policies and measures and implementation of corresponding measures to mitigate climate change by limiting their anthropogenic emissions of greenhouse gases and protecting their sinks and reservoirs; and,

b. keeping other nations informed about their policies and measures so that this information can be reviewed by the Conference of Parties (CoP).

2. Commitments under Kyoto Protocol

Article 2 of the Kyoto Protocol states the activities that Annex 1 countries should take to meet their commitments under the Kyoto Protocol. Sub-paragraph 1 (a) lists a number of activities that Annex 1 nations can undertake to achieve their "quantified emission limitation and reduction commitments" (QUELROS). These activities are:

- enhancement of energy efficiency;
- protection and enhancement of sinks and reservoirs of greenhouse gases not controlled by the Montreal Protocol and promotion of sustainable forest management, afforestation and reforestation;
- promotion of sustainable agriculture;
- research and promotion of new and renewable sources of energy, carbon dioxide sequestration technologies, and innovative environmentally-sound technologies;
- changes in fiscal policies, including subsidies in all greenhouse gas emitting sectors;
- reforms in relevant sectors;
- limit and/or reduce greenhouse gases from the transport sector; and,
- limit and/or reduce methane emissions through better management of wastes and of the energy sector.

The article also says that countries should cooperate with each other to enhance their individual and combined effectiveness. The COP serving as the first meeting of Parties (MOP) to the Kyoto Protocol will consider ways to facilitate such cooperation.

Paragraph 3 states that measures taken by Annex 1 nations must minimize adverse effects, including adverse effects:

- of climate change;
- of measures taken to address climate change on international trade; and,
- social, environmental and economic impacts on other nations, especially developing countries and in particular small island nations; countries with low-lying coastal areas; countries with arid and semi-arid areas, forested areas and areas liable to forest decay; countries with areas prone to natural disasters; countries with areas liable to drought and desertification; countries with areas of high urban atmospheric pollution; countries with areas with fragile ecosystems, including mountainous ecosystems; countries whose economies are highly dependent on income generated from production, processing and export, and/or on

consumption of fossil fuels and associated energy-intensive products; land-locked and transit countries; and, least developed countries.

3. Emission Reduction Targets

Paragraph 1 of Article 3 details the first commitment period and the overall reduction targets. It says, that a reduction in "*...overall emission of such gases by at least 5 per cent below 1990 levels in the commitment period 2008-2012*" has to be achieved by Annex 1 countries as a whole. The greenhouse gases are listed in Annex A of the Kyoto Protocol and the quantified emission limitation and reduction commitments (QUELROS) are listed in Annex B.

This sub-paragraph also states that Annex 1 nations can meet their reduction targets individually or jointly. It also clarifies that their "aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases" should not exceed their 'assigned amounts'.

Annex 1 countries can take 1995 as the base year for estimating their QUELROS with respect to the three gases — hydrofluorocarbons (HFCs), perfluorocarbons and sulphur hexafluoride — which are helping to reduce damage to the ozone layer, a threat which is being addressed by the Montreal Protocol on Substances that Deplete the Ozone Layer. These gases have a potential to cause global warming.

4. Mechanisms for attaining targets

a. Bubble Formation

Article 4 of the Kyoto Protocol contains a provision which allow developed nations to form a bubble wherein they can set out their own individual targets as long as the countries which set out to form a 'bubble' meet their targets in aggregate. However, this provision will be applicable only for first commitment period. In case countries that form a bubble fail to achieve their "total combined level of emission reduction", each party to that agreement will be responsible only for that level of emissions that have been set out in the agreement

b. Formation of national accounting system

The article 4 of the Protocol states that all Annex I nations must have in place, no later than one year prior to the start of the first commitment period, namely, by 2007, a national accounting system for estimation of emissions of greenhouse gases and their absorption by sinks. The methodology for these estimations will be developed by the Intergovernmental Panel on Climate Change and agreed by COP-3 which was held in Kyoto in December 1997. MOP-I will build upon these

methodologies to develop guidelines for the national accounting systems. Where such methodologies are not used, appropriate adjustments to these methodologies can be agreed upon by MOP-I. The MOPs will take advice of IPCC, SUBSTA and other bodies to regularly review and, where necessary, revise these methodologies.

c. Joint Implementation

Joint Implementation means transfer of emissions reduction at the project level only between Annex I Parties. This is one of the three flexible mechanism provided to Annex I Parties in Kyoto Protocol for accomplishing their reduction targets.

d. Clean development Mechanism

Article 12 of the Protocol defines Clean Development Mechanism (CDM). Unlike Article 6, this is a mechanism between industrialized countries and developing countries.

e. Emission Trading

Article 17 of the Protocol states that the Parties included in Annex B may participate in emissions trading for the purposes of fulfilling their commitments under Article 3. This provides the Parties with another flexible mechanism under the Protocol for fulfillment of the commitment.

<u>Bodies under the Protocol</u>

1. Meeting of Parties (MOP)

As per the article 13 of the Protocol, the COP, which is the supreme body of the FCCC, will also serve as the Meeting of Parties (MOP) of the Kyoto Protocol. Nations that have become parties to the FCCC but not parties to the Protocol can participate as observers in the MOP. The MOP will regularly review the implementation of the Protocol and take decisions to promote its effective implementation. It will also assess the overall effects, in particular environmental, economic and social effects, of the measures taken in pursuance of the Protocol and the extent to which progress is being made to achieve the objective of the FCCC. It will periodically examine the obligations of parties *i.e.* the adequacy of their commitments in the light of new scientific and technical knowledge and consider and adopt regular reports on the implementation of the Protocol.

The MOP will also:

- promote exchange of information on measures adopted by parties to address climate change and its effects;
- coordinate measures adopted by two or more parties, at their request, to address climate and its effects;
- develop and periodically refine comparable methodologies for the effective implementation of the KP;
- recommend any other matter necessary for the implementation of the KP;
- mobilise additional financial resources as indicated in Article 11.2 of the KP;
- establish subsidiary bodies as required;
- seek the services of competent international organisations, and intergovernmental bodies and NGOs, as necessary; and,
- undertake all other steps as may be required to implement the KP.

The first MOP will take place in conjunction with the first CoP that meets after the KP has entered into force. Subsequent ordinary sessions of the MOPs will take place every year and in conjunction with the ordinary sessions of the CoPs.

Extraordinary sessions of the MOPs will be held either if they have been decided by earlier MOPs or at the request of any party, provided one-third or more parties agree within six months of the request being communicated by the secretariat.

National or international, governmental or non-governmental agencies can attend the MOP as observers provided they are qualified in matters covered by the Protocol, they have informed the secretariat in advance, and their presence has not been objected to by at least one-third of the parties present.

2. Secretariat

As per the Article 14 of the Protocol, the Secretariat for the KP will be the same as the Secretariat for the FCCC. It will have same functions and arrangements for functioning as specified in the convention. The Secretariat shall, in addition to its functions under the FCCC, exercise the functions assigned to it under this Protocol.

3. Subsidiary Bodies

The Subsidiary Body for Scientific and Technological Advice (SBSTA) and the Subsidiary Body for Implementation (SBI) established by Articles 9 and 10 of the Convention shall serve as, the Subsidiary Body for Scientific and Technological

Advice and the Subsidiary Body for Implementation of this Protocol. They will have same functions as specified in the convention.

Kyoto Protocol Mechanisms

Under the UNFCCC, Countries are separated into 2 categories:
1.Developed - referred to as Annexure 1 Countries, and
2. Developing – referred to as Non-Annexure 1 Countries

Annex I (developed countries) agreed to reduce their GHGs by 5.2 % below 1990 levels in the Protocol's 1st commitment period i.e 2008 – 2012.

The Kyoto Protocol is only binding 'industrialized' or 'developed' countries. These are states listed in Annex 1 of the UNFCCC. The protocol commits developed countries to specific targets for reducing their green house gas emissions. Each country has a prescribed number of 'emission units' which make up the target emission. The Kyoto Protocol provides mechanisms for countries to meet their emission targets.

The Kyoto Protocol provides for three market-based mechanisms that enable countries or operators in developed countries to acquire greenhouse gas reduction credits:

1. Emissions Trading, (also known as "the carbon market")
2. Joint Implementation (JI)
3. The Clean Development Mechanism (CDM)

International Emission Trading

Emissions trading (ET) is a mechanism that enables countries with legally binding emission targets to buy and sell emissions allowances among themselves. Each country has a certain number of emission allowances (amount of carbon dioxide it can emit) in line with its Kyoto reduction targets. Countries can trade in the international carbon credit market to cover their shortfall in allowances. Countries with surplus credits can sell them to countries with capped emission commitments under the Kyoto Protocol.

Emissions trading transfers "assigned amount units" or AAU units. One AAU is equal to one metric tonne of carbon dioxide equivalent, calculated using global warming potentials. The buyer will then use the credits to meet their emissions targets. Thus a new commodity was created in the form of emission reductions

or removals. Carbon is now tracked and traded like any other commodity. This is known as the "carbon market." The carbon market is a key tool for reducing emissions worldwide. Currently, futures contracts in carbon credits are actively traded in the European exchanges (ECX).

Participants in the market include Project enablers, Public utilities, manufacturing entities, Hedgers, Intermediaries, Ultimate buyers, banks, and others. The potential buyers of carbon credits are mostly in various Annexure I countries that need to meet the compliance prevailing in their countries as per the Kyoto Protocol or those investors who would like buy the credits and with the expectation of selling them at a higher price during the first commitment period of the Kyoto Protocol (2008-2012). The major sources of supply are Non-Annexure I countries.

Emission Markets

a. European Union Emission Trading System (EU ETS) – Multi Country trading Scheme
b. Chicago Climate Exchange (CCX) - North America
c. European Climate Exchange - Europe
d. Nord Pool - Norway, Denmark, Sweden and Finland
e. Powernext - Powernext is a Paris-based company operating a European energy exchange, owned by NYSE Euronext
f. Multi Commodity Exchange – India
g. National Commodity and Derivatives Exchange - India

Joint Implementation

The Joint Implementation (JI) mechanism allows a country with an emission reduction or limitation commitment i.e an Annex I Country to earn emission reduction units (ERUs) from an emission-reduction or emission removal project in another Annex I Country, each equivalent to one tonne of CO2, which can be counted towards meeting its Kyoto target. It is done because of geographical or cost implications. Emission reduction units (ERUs) created through joint implementation is treated in the same way as those from emissions trading.

JI project must provide a reduction in emissions by sources, or an enhancement of removals by sinks, that is additional to what would otherwise have occurred. Projects must have approval of the host Party and participants have to be authorized to participate by a Party involved in the project.

There are 2 procedures under this mechanism. If a host Party meets all of the eligibility requirements to transfer and/or acquire ERUs, it may verify emission reductions or enhancements of removals from a JI project as being additional to any that would otherwise occur. Upon such verification, the host Party may issue the appropriate quantity of ERUs. This procedure is commonly referred to as the "Track 1" procedure." If a host Party does not meet all, but only a limited set of eligibility requirements, verification of emission reductions or enhancements of removals as being additional has to be done through the verification procedure under the Joint Implementation Supervisory Committee (JISC). This is known as the "Track 2" procedure. Under this "Track 2" procedure, an Accredited Independent Entity (AIE), accredited by the JISC has to determine whether the relevant requirements have been met before the host Party can issue and transfer ERUs.

Clean Development Mechanism

The Clean Development Mechanism (CDM) offers industrialized countries the possibility to engage in economically and environmentally competitive emission reduction projects in developing countries (the Non-Annexure I countries). Through the CDM, certified emission reductions (CERs) will be generated. These certified emission reduction (CER) credits, each equivalent to one tonne of CO2, can be can be traded and sold, and used by industrialized countries for the purpose of being counted towards meeting Kyoto targets.

Projects that will be implemented through the CDM have to fulfill additional criteria that will be defined by a national framework of the host countries (developing countries, where the project will be implemented). A CDM project has a pre-defined project-cycle that was defined by the UNFCCC, the official executive institution concerning these questions.

The mechanism stimulates sustainable development and emission reductions, while giving industrialized countries some flexibility in how they meet their emission reduction limitation targets. The gains to the developing country host parties are in the form of finance, technology, and sustainable development benefits while investors profit from CDM projects by obtaining reductions at costs lower than in their own countries.

Certified Emission Reduction

Certified Emission Reductions (CERs) are climate credits (or carbon credits) issued by the Clean Development Mechanism (CDM) Executive Board for emission reductions achieved by CDM projects and verified by a Designated Operational Entity (DOE) under the rules of the Kyoto Protocol. CERs can be used by Annex 1 countries in order to comply with their emission limitation targets or by operators of installations covered by the European Union Emission Trading Scheme (EU ETS) in order to comply with their obligations to surrender EU Allowances, CERs or Emission Reduction Units (ERUs) for the CO2 emissions of their installations.

THE CLEAN DEVELOPMENT MECHANISM

The Clean Development Mechanism (CDM) offers industrialized countries the possibility to engage in economically and environmentally competitive emission reduction projects in developing countries (the Non-Annexure I countries). Through the CDM, certified emission reductions (CERs) will be generated. These certified emission reduction (CER) credits, each equivalent to one tonne of CO2, can be can be traded and sold, and used by industrialized countries for the purpose of being counted towards meeting Kyoto targets.

Projects that will be implemented through the CDM have to fulfill additional criteria that will be defined by a national framework of the host countries (developing countries, where the project will be implemented). A CDM project has a pre-defined project-cycle that was defined by the United Nations Framework Convention on Climate Change (UNFCCC).

Eligibility for setting up CDM projects

To set up a CDM project, the project proponent has to ensure that:

1. The CDM Project must promote sustainable development as defined by host countries

2. Emission reductions must be:
a. Real
b. Measurable
c. Long term reduction
d. Additional

3. Funding for CDM must not divert funds from existing government development programs

4. There should be voluntary participation by each party involved

5. The activity must ensure access to environmentally sound technology needed by the developing country.

The basic rules for the functioning of the CDM were agreed on at the seventh Conference of Parties (COP-7) to the UNFCCC held in Marrakesh, Morocco in October-November 2001. At COP-7, it was decided that the following types of projects would qualify for fast-track approval procedures:

- Renewable energy projects with output capacity up to 15 MW
- Energy efficiency improvement projects which reduce energy consumption on the supply and/or demand side by up to 15 GWh annually
- Other project activities that both reduce emissions by sources and directly emit less than 15 kt CO2 equivalent annually.

The projects must qualify through a rigorous and public registration and issuance process designed to ensure real, measurable and verifiable emission reductions that are additional to what would have occurred without the project

Additionality

CDM Projects have to satisfy the "additionality" criteria, which means – " The emission reductions of the proposed project must be additional to any that would occur in absence of the project".

According to the Kyoto Protocol, gas emission reductions generated by project activities must be additional to those that otherwise would occur. Additionality is established when there is a positive difference between the emissions that occur in the baseline scenario, and the emissions that occur in the proposed project.

The project proposal should establish the following in order to qualify for consideration as CDM project activity:

- Emission Additionality: The project should lead to real, measurable and long term GHG mitigation. The additional GHG reductions are to be calculated with reference to a baseline
- Financial Additionality: The procurement of Certified Emission Reduction (CERs) should not be from Official Development Assistance (ODA)
- Environmental additionality: It looks as to what would happen without the project. This includes a dialogue of impact of the project activity on resource sustainability, reduction of the level of pollution by the project etc.
- Technological additionality: The CDM project activities should lead to transfer of environmentally safe and sound technologies and knowledge.

There are other sustainable development indicators which is the prerogative of the host Party to confirm whether a CDM project activity assists it in achieving sustainable development. The CDM projects should also be oriented towards improving the quality of life of the poor from the environmental standpoint.

Examples of CDM Projects

The CDM projects may vary much in their nature and context, but as the market develops further the diversity of project types is likely to grow. Examples of projects are given below, classified in 12 categories:

1. Installations based on renewable energy sources
Utilization of wind, wave/tidal, solar, hydro, biomass or geothermal energy sources in order to generate electricity or heat. In such projects the emission reductions occur by substituting electricity and/or heat generated by combustion of fossil fuels with electricity and/or heat from zero-emission sources.

2. Fuel switch to lower carbon intensive fuels
If one fossil fuel is substituted with another less carbon intensive fuel this would lead to emission reductions. An example could be switching from coal to gas-fired power or heat generation at a heat and power station or in industry.

3. Energy efficiency at supply side of energy systems
The energy industry can mitigate emissions if improving the efficiency of energy generation and distribution by reducing losses in these processes. Reducing electricity losses in transmission and distribution grid would lead to a lower consumption of fossil fuels per kWh electricity delivered and thus lower emissions.

4. Energy efficiency at the demand side.
Manufacturing industries can reduce emissions by cutting direct consumption of fossil fuels such as coal or gas, or indirectly, by minimizing energy and electricity use. These projects could be best fitted to large heavy industries, such as metallurgical, cement, glass, etc. Programmes for energy efficiency in buildings could also generate CERs.

5. Combined heat and power projects
By implementing cogeneration projects the waste heat from a conventional power plant could be utilized for industrial heating processes or supply heat to a district heating network. If the district heating is based on i.e coal combustion the heat that otherwise would have been wasted can reduce the consumption of coal, thus reducing GHG emissions.
Note: Cogeneration is the use of a heat engine or a power station to simultaneously generate both electricity and useful heat.

6. Chemical Industries
In nitric acid/ammonia production processes, N20 waste gases are often emitted. Given high GHG potential of nitrous oxide, destroying or catalysing this gas yields a high volume of CERs. Another example is reducing PFCs emissions as a result of "anode effect" in smelting of aluminium.

7. Mining and minerals production
Methane is often emitted from coal beds and mines. If it is captured it could be flared or used for electricity generation, reducing the fugitive emissions that would otherwise occur. Each ton methane abated could generate 21 CERs.

8. Reduction of methane emissions from waste handling facilities
When municipal solid waste is deposited in land-fills, methane is generated due to anaerobic decomposition processes. Similar type of processes happens in treatment of municipal wastewater and wastewater resulting from production of starch. These methane streams could be collected in order to simply flare or to generate heat/electricity in addition to reducing methane emissions to the atmosphere.
9. Fugitive emissions from fuels
This category of projects includes recovery and utilization of gas flared from oils wells and reduction of fugitive emissions from leaking gas pipelines.

10. Transport
Transport is responsible for approximately 30% of the global GHG emissions. CDM projects in this sector focus on decreasing the consumption of diesel and petrol by using more efficient vehicles and utilizing fuels such as bio-gas, bio-

ethanol or bio-diesel.

11. Reduction of methane emissions from biomass
In agriculture and timber industry, biomass is often considered as waste and dumped landfills where the anaerobic decomposition leads to emission of methane. The methane emissions can be avoided by combusting of the biomass to generate heat and/or electricity.

12. Other type of projects
Other types of projects are planting of trees (afforestation /reforestation), reducing use of solvents and destruction of HFCs.

Institutional Framework

- The CDM is administered by the CDM Executive Board (CDM Board) which reports and is accountable to the Conference of Parties (COP).
- A Certified Emission reduction (CER) certificate is given by the CDM Executive Board of the UNFCCC.
- Developing country is the Project Developer also known as the Host Party/Country
- Annexure 1 countries are the Investors
- The project has to be first approved by Designated National Authority (DNA) of the Host country where the project is being set up. The Designated National Authority (DNA) in India is the National Clean Development Mechanism Authority (NCDMA)
- An institution which verifies the essential prerequisites for CDM projects and certifies the emission reductions is the Designated Operational Entity (DOE)

Steps in development of CDM Project:

- Identify Project Idea
- Prepare Project Concept Note (PCN)
- Project Development and prepare Project Design Document (PDD)
- Approval by DNA
- Project validation by DOE and Registration by CDM Executive Board
- Monitoring by Entities
- Verification by DOE
- Issuance of Certified Emission Reductions (CER) by CDM Executive Board

In India, clearance for a CDM project is granted by the National CDM Authority (NCDMA)and is spearheaded by the Union Ministry of Environment and Forests.

Irrespective of whether CDM projects are initiated by the private sector, non-government organisations or government agencies, their development will involve a number of essential steps. This section outlines these requirements, from a project developer's perspective.

1. Identify project and develop project concept note

The process of developing a CDM project starts by identifying an idea that will reduce GHG emissions. The initial steps require the project proponent to examine the emissions reduction resulting from the project and to ascertain if it contributes to the development priorities of the nation. This will need to take into account any national or regional requirements for project eligibility. Project developers should note that potential investors and verification bodies will also operate their own screening procedures. It is important that local stakeholders' needs and aspirations are considered at this early stage.

A **Project Concept Note (PCN)** needs to be submitted. The National CDM Authority in India has specified format for the project Concept note. PCN is a brief description of a project prepared by the project proponent entity or intermediary.

2. Project Development and Project Design Document.

Each project plan should include details of how the greenhouse gas benefits are calculated and how they will be monitored over time. In most cases the quantification of benefits will begin prior to submission to the National CDM Authority. Quantification involves the following steps:

- *Definition of the boundaries of the project* - this will result in a list of all the processes that result in uptake or release of carbon (and other greenhouse gases covered by the Kyoto Protocol) as a result of the project activities.
- *Description of the baseline and additionality* - the effect of the project is measured relative to a 'baseline scenario' that represents what would happen in the absence of the project. Additionality is the extent to which

the activities promoted by the project (e.g. the planting of trees) can only have happened with the project's specific intervention

- *Quantification of baseline emissions and crediting period* - the emissions that would occur with the baseline scenario, and the number of years over which the project may take credit, will be defined using one of the procedures approved by the CDM Executive Board.

The project proposal must clearly and transparently describe methodology of determination of baseline. It should confirm to following:

• Baselines should be precise, transparent, comparable and workable;
• Should avoid overestimation;
• The methodology for determination of baseline should be homogeneous and reliable;
• Potential errors should be indicated;
• System boundaries of baselines should be established;
• Interval between updates of baselines should be clearly described;
• Role of externalities should be brought out (social, economic and environmental);
• Should include historic emission data-sets wherever available;
• Lifetime of project cycle should be clearly mentioned;

The project proponent could develop a new methodology for its project activity or could use one of the approved methodologies by the CDM Executive Board. For small scale CDM projects, the simplified procedures can be used by the project proponent. The project proposal should indicate the formulae used for calculating GHG offsets in the project and baseline scenario. Leakage, if any, within or outside the project boundary, should be clearly described. Determination of alternative project, which would have come up in absence of proposed CDM project activity should also be described in the project proposal.

- *The emissions and uptake of carbon by the project* - in the case of afforestation and reforestation projects, the uptake of carbon will be calculated using forestry growth data. The net benefit of the project is then calculated by subtracting the emissions that would have occurred in the baseline scenario.

- *Adjustment for leakage and risk* - The amount of benefit for which a project will be allowed to take credit may need to be adjusted to take account of leakage and risks. Creating a reserve or buffer of carbon offsets is one

method that has been proposed for dealing with project risks. The best approach to managing leakage is to avoid it in the first place. This is best done at the project design stage, notably by:

- Consultation with local stakeholders;
- Integration of project design with local, regional and/or national priorities and legislation;
- Participation of landowners or managers in the project, avoiding their exclusion or displacement;
- Clear and fair benefit sharing through the project;
- Awareness building of carbon project needs;
- Effective monitoring of project activities and likely sources of leakage.

The results and methodologies used in the quantification of the greenhouse gas benefits will need to be presented in a Project Design Document.

Project Design Document (PDD) is a project specific document required under the CDM rules which will enable the Operational Entity to determine whether the project (i) has been approved by the parties involved in a project, (ii) would result in reductions of greenhouse gas emissions that are additional, (iii) has an appropriate baseline and monitoring plan.

A report summarising comments by local stakeholders and how these are taken into account in the project design must also be included in this document.

Baseline and Methodologies

The baseline is the basis for calculation of the emission reductions generated by a CDM project. The baseline-or reference scenario-of a CDM project comprises the current level and the evolution of GHG emissions which might occur if the CDM activity were not implemented. This scenario is used for calculating emission reductions (carbon credits) to be generated by the project.

The amount of emission reduction, obviously, depends on the emissions that would have occurred without the project minus the emissions of the project. The construction of such a hypothetical scenario is known as the baseline of the project.

The baseline may be estimated through reference to emissions from similar activities and technologies in the same country or other countries, or to actual emissions prior to project implementation. The partners involved in the project could have an interest in establishing a baseline with high emissions, which would yield a risk of awarding spurious credits. Independent third party verification is meant to ameliorate this potential problem.

Project baselines must be established using one of the existing methodologies approved by the CDM Executive Board, or a new methodology. A new methodology needs to be approved by the CDM Executive Board before validation can take place.

Methodologies rely on one of the following three underlying approaches, or on a combination of them:

- Existing actual or historical emissions, as applicable.
- Emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment.
- The average emissions of similar project activities undertaken in the previous five years in similar social, economic, environmental and technological circumstances, and whose performance is among the top 20% of their category.

3. ***Host country approval***

Any project wishing to participate in the CDM must obtain approval from the host government. A pro-active government National Authority for CDM will facilitate this. In addition, the host government should determine whether or not the project will lead to sustainable development benefits.

The National CDM Authority is a single window clearance for CDM projects in the country. The project proponents are required to submit one soft copy of Project Concept Note (PCN) and Project Design Document (PDD) through online form and 20 hardcopies each of PCN and PDD along with two CDs containing all the information in each of them.

The project report and CDs should be forwarded through covering letter signed by the project sponsors. The project report submitted should be properly bound. The National CDM Authority examines the documents and if there are any preliminary queries the same are asked from the project proponents. The project proposals are then put up for consideration by the National CDM Authority. The project proponent and his consultants are normally given about 10-15 days notice to come to the Authority meeting and give a brief power point presentation regarding their CDM project proposals. Members seek clarifications during the presentation and in case the members feel that some additional clarifications or information is required from the project proponent the same is informed to the presenter. Once the members of Authority are satisfied, the Host Country Approval (HCA) is issued by the Member-Secretary of the National CDM Authority.

4. Validation of the project

A CDM project must be checked by two processes – **Validation** and **Verification**. Validation is done once before initial project approval. Verification is done periodically after the project has been approved or registered.

Before projects can produce emission reductions that will be recognised by the CDM, they must be 'validated' by one of the independent companies approved by the CDM Executive Board. The project developer must submit the Project Design Document and any related documentation to the 'Designated Operational Entity'. The process will involve detailed scrutiny of the institutional capacity of the project stakeholders, the evidence underlying the calculations of carbon benefits, the systems to be used for monitoring, and the relevant government approvals. During this period, the Project Design Document will be made publicly available for comments.

A designated operational entity (DOE) is an independent auditor accredited by the CDM Executive Board (CDM EB) to validate project proposals or verify whether implemented projects have achieved planned greenhouse gas emission reductions.

A Designated Operational Entity under the CDM is either a domestic legal entity or an international organization accredited and designated, by the CDM Executive Board (CDM EB).

It has two key functions:

1. Validation - It validates and subsequently requests registration of a proposed CDM project activity which will be considered valid after 8 weeks if no request for review was made.

2. Verification/ Certification - It verifies emission reduction of a registered CDM project activity, certifies as appropriate and requests the Board to issue Certified Emission Reductions accordingly. The issuance will be considered final 15 days after the request is made unless a request of review is made

Usually, for large scale projects, a DOE may only conduct either validation or verification of the same project. However, upon request, the CDM EB may allow a single DOE to perform both functions (validation and verification/certification).

Designated Operational Entities in India:

- TUV Suddeutschland India (www.tun-sud.in/CDM.asp)
- Det Norske Veritas (www.dnv.com/services/certification/climate_change/index.asp)
- SGS United Kingdom Limited (www.sgs.com)
- tüv Rheinland India (www.tuv.com)
- BVQI(Bureau Veritas Quality International) (www.**bureauveritas**.co.in)

Validation

Based on the project design document (PDD), the DOE will evaluate and validate the proposed CDM project, confirming:

1.Voluntary participation of parties
2. Comments by stakeholders have been invited
3. Project participants have submitted documentation on environmental impacts to the DOE
4. The project will result in reduction in greenhouse gas that are additional
5. A methodology has been adopted in accordance with CDM rules
6. Provisions for monitoring, verification and reporting are in accordance with CDM rules
7. The project complies with all other CDM rules

The DOE then issues a validation report, and requests the CDM Executive Board for registration of the project based on this report.

*5. **Registration with the CDM***

The validation report and Project Design Document will be submitted to the CDM Executive Board by the operational entity. Registration will be finalised after a maximum of 8 weeks from receipt, unless a review is requested. The detailed procedure for registration is stated below:

1. In accordance with paragraph 40 (f) of the CDM modalities and procedures (CDM M&P), the request for registration of a proposed CDM project activity shall be in the form of a validation report which includes the project design document, the written approval of the host Party and an explanation of how the DOE has taken due account of public comments received on the CDM-PDD.

2. A designated operational entity shall submit its validation report using the "CDM project activity registration and validation report form" (F-CDM-REG)

(attached to these procedures) to request for registration of a proposed project activity.

3. In order to ensure transparency and efficiency of the registration process:
(a) A request for registration will only be processed after the secretariat has determined that all information and documentation requested in the registration form has been provided by the DOE;

(b) The date of receipt of a request for registration is the date when the deposit of the registration fee indicated in the registration form has been received by the secretariat;

(c) A request for registration" (as defined in paragraph 40 (f) of the CDM modalities and procedures) shall be made publicly available through the UNFCCC CDM web site (either by a link to the DOE web site or by being directly posted) for a period of eight (8) weeks. The secretariat shall announce a request for registration of a proposed CDM project activity on the UNFCCC CDM web site and in the CDM news facility. The announcement shall specify where the request for registration can be found, the name of the proposed CDM project activity and the first and last day of the eight-week period. The secretariat shall notify the DOE requesting a registration when and where the request for registration is posted.

(d) Unless there is a request for review, a request for registration shall, after eight weeks, bemarked in the UNFCC CDM web site as "registration completed" and the corresponding proposed CDMproject activity and related public documents recorded/displayed as registered.

Registration Fee to be paid:

A registration fee schedule applies to submissions of request for registration of proposed project activities under the clean development mechanism (CDM).

The share of proceeds to cover administrative expenses is:

(a) USD 0.10 per certified emission reduction issued for the first 15,000 tonnes of CO2 equivalent for which issuance is requested in a given year.

(b) USD 0.20 per certified emission reduction issued for any amount in excess of 15,000 tonnes of CO2 equivalent for which issuance is requested in a given year.

(c) No share of proceeds shall be due for project activities hosted in least developed countries. The application of this exemption shall be based on the status of the country on the date of the publication of the request for issuance of certified emissions reductions.

The registration fee shall be the share of proceeds applied to the expected average annual certified emission reductions for the proposed project activity over its crediting period, as identified in the project design document and as validated by the designated operational entity (DOE).

Upon resubmission of a request for registration directly following a determination by the secretariat that the submission is incomplete, no registration fee must be paid unless the resubmission results in an increase in the expected average annual certified emission reductions for the proposed project activity over its crediting period. If the resubmission results in an increase in the expected average annual certified emission reductions, then the registration fee due shall be recalculated upon resubmission. The registration fee due upon resubmission shall be difference between the recalculated registration fee and the registration fee previously paid.

For the purpose calculating the registration fee for proposed afforestation/reforestation project activities, "certified emission reductions" shall mean the net greenhouse gas removals by sinks.

The maximum registration fee payable based on this calculation shall be USD 350,000.

No registration fee must be paid for proposed project activities with expected average annual emission reductions over the crediting period below 15,000 tonnes of CO2 equivalent.

6. Project implementation and monitoring

Registered projects, and those that have entered the implementation phase, will be required to maintain internal monitoring systems to demonstrate they are achieving the emission reductions specified in the Project Design Document

7. Verification and certification

Once the project is being implemented, it will undergo additional scrutiny by the operational entities in the form of verification and certification. The verification report is then made available to the CDM Executive Board and the general

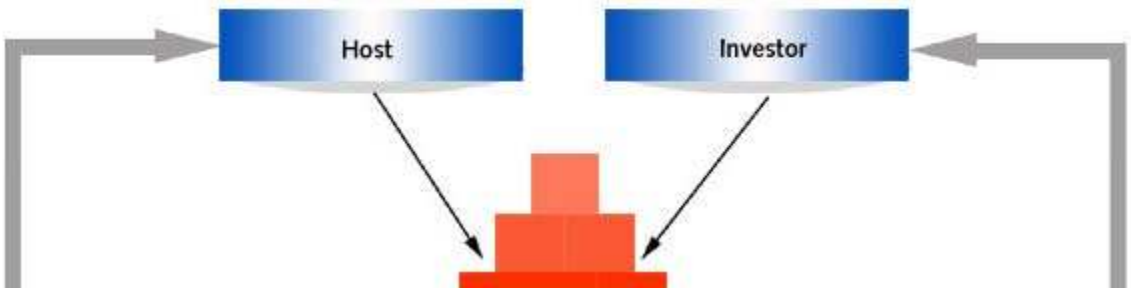
public, after which the Certified Emission Reductions will be issued to the project developer within 15 days, unless the Executive Board requests a review.

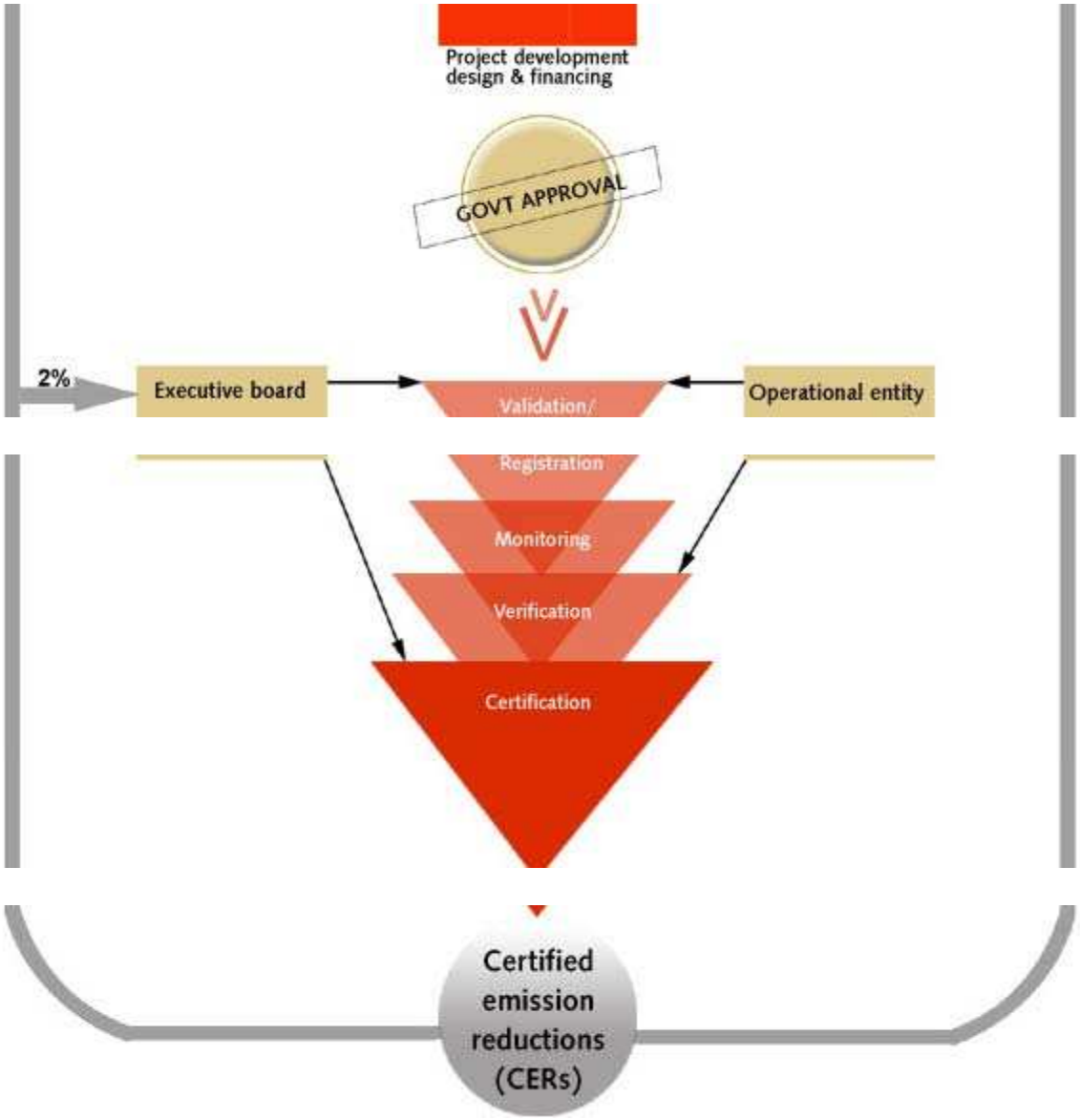
Registration Procedure for Small Scale CDM Projects

Projects registered as small-scale CDM projects are entitled to use the simplified modalities and procedures for small-scale CDM project activities set out in 4/CMP.1, Annex II. To qualify as small scale a project activity must meet the eligibility requirements. The proposed project activity shall:

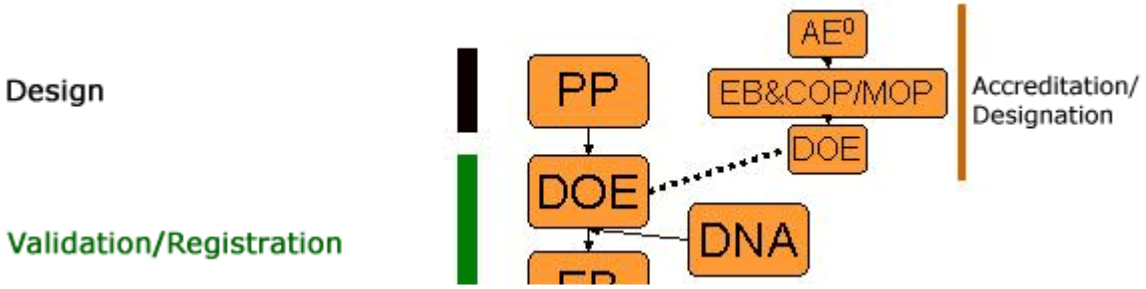
1. Meet the eligibility criteria for small-scale CDM project activities set out in paragraph 6 (c) of decision 17/CP.7.
2. Conform to one of the project categories in appendix B to Annex II. This list shall not preclude other types of small-scale CDM project activities. If a proposed small-scale CDM project activity does not fall into any of the categories in appendix B, the project participants may submit a request to the Executive Board for approval of a simplified baseline and/or monitoring plan developed.
3. Not be a debundled component of a larger project activity.

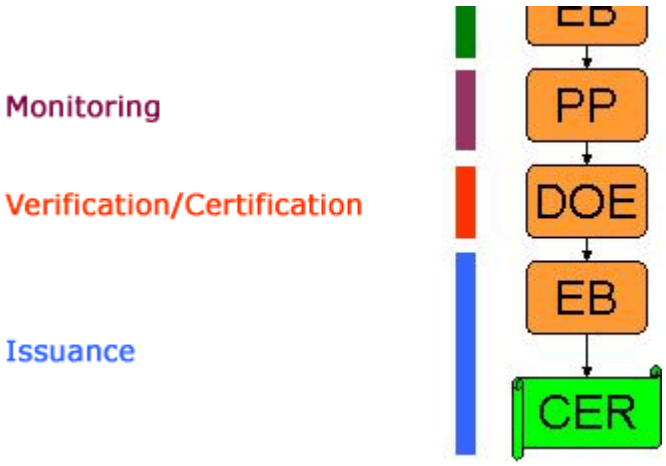
The CDM project cycle





Parties Involved in the CDM Cycle





Legend		
PP	-	Project Proponent
DOE	-	Designated Operational Entities
AE	-	Applicant Entity
EB	-	Executive Board
COP/MOP	-	Conference of the Parties and Meetings serving as the meeting of the Parties to the Kyoto Protocol
CER	-	Certified Emission Reductions
DNA	-	Designated National Authority

The National Clean Development Mechanism Authority (NCDMA).

The National CDM Authority (NCDMA) is a single window clearance for CDM projects in the country. The project proponents are required to apply to the administrator of National CDM Authority through the website by filling the User Registration form. Upon acceptance of the request, the project proponent shall fill in online the Project Concept Note (PCN) and also upload the Project Design Document (PDD).

The National CDM Authority examines the documents and if there are any preliminary queries the same are asked from the project proponents. The project proposals are then put up for consideration by the National CDM Authority. The project proponent and his consultants are normally given about 10-15 days notice to come to the Authority meeting and give a brief power point presentation regarding their CDM project proposals. Members seek clarifications during the presentation and in case the members feel that some additional clarifications or information is required from the project proponent, the same is informed to the presenter. Once the members of Authority are satisfied, the Host Country Approval (HCA) is issued by the Member-Secretary of the National CDM Authority.

Benefits for India

India is seen as one of the Non-Annex I countries offering the largest potential for Clean Development Mechanism (CDM) development, besides China and Brazil.

The Indian CDM project portfolio has grown exponentially. Out of the 4644 project activities registered by UNFCCC as on 19.9.2012, India bags 901 registered project activities.
As on 20.9.2012, a total of 1,005,175,604 CERs have been issued out of which India has issued 14.78% i.e 148,558,219 CERs.

By Clean Development Mechanism (CDM) Projects, India has a lot to gain from Carbon Credits:

- It will gain in terms of advanced technological improvements and related foreign investments.
- It will contribute to the underlying theme of green house gas reduction by adopting alternative sources of energy
- Indian companies can make profits by selling the CERs to the developed countries to meet their emission targets.

India being a developing country has no emission targets to be followed. However, it can enter into CDM projects. Industries like cement, steel, power, textile, fertilizer etc emit green houses gases as an outcome of burning fossil fuels. Companies investing in Windmill, Bio-gas, Bio-diesel, and Co-generation are the ones generating carbon credits for selling to developed nations. Polluting industries, which are trying to reduce emissions and in turn earn carbon credits and make money include steel, power generation, cement, fertilizers, waste disposal units, plantation companies, sugar companies, chemical plants and municipal corporations.

Type of projects, which are being applied for CDM and which can be of valuable potential, are:

• Energy efficiency projects
– Increasing building efficiency (Concept of Green Building/LEED Rating)
– Increasing commercial/industrial energy efficiency (Renovation & Modernization of old power plants)
– Fuel switching from more carbon intensive fuels to less carbon intensive fuels; and

– Also includes re-powering, upgrading instrumentation, controls, and/or equipment

• Transport
– Improvements in vehicle fuel efficiency by the introduction of new technologies
– Changes in vehicles and/or fuel type, for example, switch to electric cars or fuel cell vehicles (CNG/Bio fuels)
– Switch of transport mode, e.g. changing to less carbon intensive means of transport like trains (Metro in Delhi); and
– Reducing the frequency of the transport activity

• Methane recovery
– Animal waste methane recovery & utilization

• Installing an anaerobic digester & utilizing methane to produce energy
– Coal mine methane recovery

• Collection & utilization of fugitive methane from coal mining;
– Capture of biogas

• Landfill methane recovery and utilization
– Capture & utilization of fugitive gas from gas pipelines;
– Methane collection and utilization from sewage/industrial waste treatment facilities

• Industrial process changes
- Any industrial process change resulting in the reduction of any category greenhouse gas emissions

• Cogeneration
- Use of waste heat from electric generation, such as exhaust from gas turbines, for industrial purposes or heating (e.g. Distillery-Molasses/ bagasse)

• Agricultural sector
– Energy efficiency improvements or switching to less carbon intensive energy sources for water pumps (irrigation)
– Methane reductions in rice cultivation
– Reducing animal waste or using produced animal waste for energy generation

The carbon credits generated can be exchanged between businesses or bought and sold in international markets at prevailing market price.

INDIA'S NATIONAL ACTION PLAN ON CLIMATE CHANGE (NAPCC)

The Government of India released The National Action plan on Climate Change (NAPCC) on 30th June, 2008 to state India's contribution towards combating climate change. The plan outlines Eight National Missions running through 2017. The NAPCC consists of several targets on climate change issues and addresses the urgent and critical concerns of the country. The Missions form the core of the Plan, representing long term integrated strategies for achieving goals in the context of climate change.

What is India's NAPCC

India's NAPCC is a National Document compiling action taken for addressing the challenge of Climate Change, and the action it proposes to take.

The Action Plan, would be implemented through a core of eight National Missions

1. National Solar Mission
2. National Mission for Enhanced Energy Efficiency
3. National Mission on Sustainable Habitat
4. National Water Mission
5. National Mission for Sustaining the Himalayan Ecosystem
6. National Mission for creating a "Green India")
7. National Mission for Sustainable Agriculture
8. National Mission on establishing a Strategic Knowledge Platform for Climate Change.

The Government plans to prepare a Ninth Mission - National Bio-energy Mission - The mission, to be launched during the 12th Five-Year Plan, will offer a policy and regulatory environment to facilitate large-scale capital investments in biomass-fired power stations. It will also encourage development of rural enterprises. However, like the previous two plans, the 12th five-year Plan (2012-17) also officially began on 2nd April, 2012 without a final document in place. The Official Document is expected to be ready by November 2012 and will then be sent to the National Development Council (NPC) for approval.

The Prime Minister's Council on Climate Change is in charge of the overall implementation of the NAPCC. The Council is Chaired by the Prime Minister. The National Missions are to be institutionalized by the respective Ministries and

will be organized through inter-sectoral groups which include in addition to related Ministries, Ministry of Finance and the Planning Commission, Experts from Industry, academia and civil society.

Each Mission was to evolve specific objectives spanning the remaining years of the 11th plan period at the time it was laid down and the 12th Plan Period and each Mission will report publicly on its annual performance.

Ministries with lead responsibility for each of the missions are directed to develop objectives, implementation strategies, timelines, and monitoring and evaluation criteria, to be submitted to the Prime Minister's Council on Climate Change.

The Council will also be responsible for periodically reviewing and reporting on each mission's progress. To be able to quantify progress, appropriate indicators and methodologies will be developed to assess both avoided emissions and adaptation benefits.

Planning Commission of India

The Planning Commission was set up by a Resolution of the Government of India in March 1950 in pursuance of declared objectives of the Government to promote a rapid rise in the standard of living of the people by efficient exploitation of the resources of the country, increasing production and offering opportunities to all for employment in the service of the community. The Planning Commission was charged with the responsibility of making assessment of all resources of the country, augmenting deficient resources, formulating plans for the most effective and balanced utilisation of resources and determining priorities.

The Prime Minister is the Chairman of the Planning Commission, which works under the overall guidance of the National Development Council. The Deputy Chairman and the full time Members of the Commission, as a composite body, provide advice and guidance to the subject Divisions for the formulation of Five Year Plans, Annual Plans, State Plans, Monitoring Plan Programmes, Projects and Schemes. The Planning Commission functions through several Divisions, each headed by a Senior Officer. At present, the 12th Five-year Plan for the period 2012-2017 is in force.

Background to India's National Action Plan on Climate Change

The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC-AR4) concluded that the warming of the Earth's Climate System is unequivocal.

The global atmospheric concentration of Carbon dioxide (Co2) has increased from a pre-industrial value of 280 ppm to to 379 ppm in 2005. Multi model averages show that the temperature increases during 2090-2099relative to 1980-1999 may range from 1.1 to 6.4 degrees Celsius and sea level rise from 0.18 to 0.59 metres.

Due to this, the Prime Ministers Council which was constituted on June 5th, 2007, in its first meeting on 13th July,2007 had decided that – "*A National Document compiling action taken for addressing the challenge of Climate Change, and the action it proposes to take*", be prepared.

Approach of the Plan:

The NAPCC identifies measures that promote the development objectives of India and at the same time yields co-benefits for addressing climate change-related objectives of adaptation and mitigation effectively. The plan document elaborates on a unique approach to reduce the stress of climate change and uses the poverty-growth linkage to make its point.

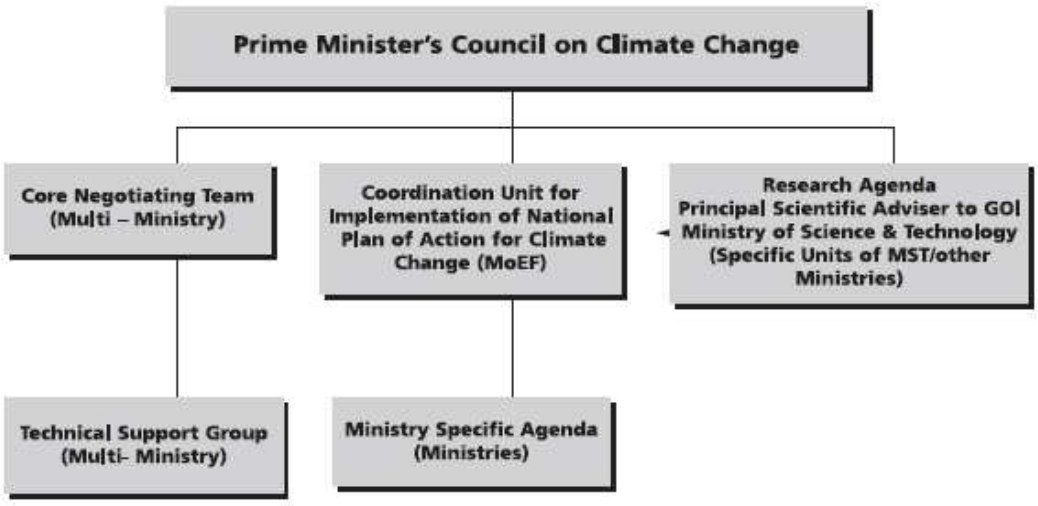
Principles of the Plan:

The guiding principles of the plan are:

1. Inclusive and sustainable development strategy to protect the poor
2. Qualitative change in the method through which the national growth objectives will be achieved i.e. by enhancing ecological sustainability leading to further mitigation
3. Cost effective strategies for end use demand side management
4. Deployment of appropriate technologies for extensive and accelerated adaptation, and mitigation of green house gases
5. Innovative market, regulatory and voluntary mechanisms to promote Sustainable Development
6. Implementation through linkages with civil society, local governments and public-private partnerships
7. International cooperation, transfer of technology and funding

Implementation of the Plan

The Prime Minister's Council on Climate Change is in charge of the overall implementation of the plan. The Council is Chaired by the Prime Minister.



The Prime Minister's Council on Climate Change was constituted on June 05, 2007 as a high-level advisory group on climate change.

The work of the Council relates to -

- coordinate National action plans for assessment, adaptation and mitigation of climate change
- advise the Government on pro-active measures that can be taken by India to deal with the challenge of climate change.
- facilitate inter-ministerial coordination and guide policy in relevant areas

The Eight National Missions

The Action Plan, would be implemented through a core of eight National Missions comprising inter-sectoral groups involving relevant
Ministries, civil society, private players and local governments.

Theses 8 missions will be responsible for achieving the broad goals of adaptation and mitigation, as applicable. The focus of the national energies is on Eight National Missions which are:

1. National Solar Mission

2. National Mission for Enhanced Energy Efficiency

3. National Mission on Sustainable Habitat

4. National Water Mission

5. National Mission for Sustaining the Himalayan Ecosystem

6. National Mission for creating a "Green India")

7. National Mission for Sustainable Agriculture

8. National Mission on establishing a Strategic Knowledge Platform for Climate Change.

Responsibility of Implementation of the Missions

These National Missions will be institutionalized by respective Ministries and will be organized through inter-sectoral groups which include in addition to related Ministries, Ministry of Finance and the Planning Commission, Experts from Industry, academia and civil society. Each Mission was to evolve specific objectives spanning the remaining years of the 11th plan period at the time it was laid down and the 12th Plan Period. Each Mission will report publicly on its annual performance.

Ministries with lead responsibility for each of the missions are directed to develop objectives, implementation strategies, timelines, and monitoring and evaluation criteria, to be submitted to the Prime Minister's Council on Climate Change.

The Council will also be responsible for periodically reviewing and reporting on each mission's progress. To be able to quantify progress, appropriate indicators and methodologies will be developed to assess both avoided emissions and adaptation benefits.

1. National Solar Mission

The National Solar Mission would promote the use of solar energy for power generation and other applications. Solar based power technologies are an

extremely clean form of generation with practically no form of emissions at the point of generation. Solar energy has great potential as future energy source.

Where necessary for the purpose of system balance or ensuring the cost-effectiveness and reliability, the National Solar Mission would also promote the integration of other renewable technologies like biomass and wind, with solar energy options.

The National Solar Mission would be launched to significanty increase the share of solar energy in the total energy mix while recognizing the need to expand the scope of other renewable and non-fossil options such as nuclear energy, wind energy and biomass.

Another aspect of the solar mission would be to launch a major Research and Development Programme, which could draw upon international co-operation as well, to enable the creation of more affordable, more convenient solar power systems and to promote innovations that enable the storage of solar power for sustained long term use.

The ultimate objective of the Mission would be to develop a solar industry in India that is capable of delivering solar energy competitively against fossil options from the Kilowatt range of distributed solar thermal and solar PV to the Gigawatt scale of base load priced and dispatchable Concentrating Solar Power (CSP) generation capacity within the next 20-25 years.

The plan goals include:

1. Solar Thermal Power Generation: Solar Thermal Power Generating Systems (STPG) or Concentrating Solar Power (CSP) use concentrated solar radiation as high temperature energy source (i.e more than 500 degrees celsisus) to produce electricity.
2. Solar Photovoltaic Generation: In Photovoltaic generation, solar energy is directly converted to electricity using a semi-conductor ususally a silicone diode
3. Reseach and Development Collaboration, Technology Transfer and Capacity Building
4. Establishment of a solar research center, increased international collaboration on technology development, strengthening of domestic manufacturing capacity, and increased government funding and international support.

2. National Mission for Enhanced Energy Efficiency

The Energy Conservation Act,2001 provides a legal mandate for the implementation of the energy efficiency measures through the institutional mechanism of the BEE (Bureau of Energy Efficiency) in the Central Government and various designated Agencies in each State. The current initiatives under the schemes and programmes is anticipated to result in a saving of 10,000MW by the end of the 11th Five Year Plan in 2012.

To enhance energy efficiency, four new initiatives will be introduced:

1. A market based mechanism to enhance cost-effectiveness of improvements in energy efficiency in energy-intensive large industries and facilities, through certification of energy savings that could be traded.
2. Accelerating the shift to energy efficient appliances in designated sectors
3. Creation of mechanisms that would help finance demand side management programmes in all sectors by capturing future energy savings
4. Developing Fiscal instruments to promote energy effeciency (like - Energy incentives, including reduced taxes on energy-efficient appliances)

The National Action Plan on Climate Change mandates setting up of energy benchmarks for each sector and allows trade in energy saving certificates. This is expected to kickstart a domestic trade in energy just as the world trades in carbon emission certificates.

The action plan seeks to create a market-based mechanism through which industrial units that use more energy than stipulated would be able to compensate by buying energy certificates from other industries consuming less energy.

This device for cajoling industries into performing better on the energy front would be part of the drive under the plan to save 10,000MW by the end of the 2012 through energy efficiency measures.

3. National Mission on Sustainable Habitat

The Mission comprises 3 components:

1. Promoting Energy Efficiency in the residential and commercial sector:
Various studies have established that substantial energy savings can be achieved in the residential and commercial sectors. There are a number of benefits of energy efficiency investments like carbon mitigation options in buildings improve energy security and system reliability.

2.Management of Municipal solid Waste:
Municipal Solid Waste (MSW) Generation reflects not just income levels but also lifestyle choices. Recycling of materials is an important option for reducing environmental pressures. India has a significantly higher rate of recycling of materials in MSW than developed countries. GHG emissions from MSW in India are also much lower than in developed countries.

3. Promotion of urban public transport :
An increase in the demand for transportation services for both passengers and freight is inevitable, given economic growth and increase of population. Various studies have estimated that Policy and Technological measures can lead to significant energy and thereby emissions savings in the transport sector. Estimates of the Planning Commission indicate an energy saving potential of 115 mtoe (million tones of oil equivalent) in the year 2031/2032 by increasing the share of railways and improving efficiencies of different modes of transport (Planning Commission, 2006).

A national Mission on sustainable Habitat will be launched to make habitat sustainable through improvements in energy efficiency in buildings, management of solid waste and modal shift to public transport.

<u>To promote energy efficiency as a core component of urban planning, the plan calls for the following initiatives:</u>

1. Extending the existing Energy Conservation Building Code:

   The Energy Conservation Building Codes under the Energy Conservation Act, 2001 are aimed at achieving total energy efficiency in buildings and establishments. The Government has introduced Energy Conservation Codes for commercial buildings, which will be implemented on a voluntary basis initially and then made mandatory

2. A greater emphasis on urban waste management and recycling, including power production from waste;
3. Major R&D programme focussing on bio chemical conversion, waste water use, sewage utilization and recycling options wherever possible.
4. Better Urban Planning and modal shift to public transport

5. Capacity Building
6. Improving the resilience of infrastructure, community based disaster management and measures for improving the warning system for extreme weather events

4. National Water Mission

The National Water Mission will be mounted to ensure integrated water resource management helping to conserve water, minimize wastage and ensure more equitable distribution both across and within states. The Mission will take into account the provisions of the National Water Policy 2002 and develop a framework to optimize wateruse by increasing water use efficiency by 20%, through regulatory mechanisms with differential entitlements and pricing. Many parts of India are water stressed today and India is likely to be water scarce by 2050. The problem way worsen due to climate change impacts. It is therefore important to increase the efficiency of water use, explore options to augment the water supply in critical areas, and ensure more effective management of water resources.

Some specific aspects of the mission are:

1. Studies on management of surface water resources

Rivers and Lakes, the most visible sources of surface water, often indicate the state of the environment more clearly than many other indicators, and they also have economic significance.

2. Management and Regulation of groundwater resources

Groundwater accounts for nearly 40% of the total available water resources in the country and meets nearly 55% of irrigation requirements, 85% of rural requirements and 50% of urban and industrial requirements. However, exploitation of groundwater has sharply lowered the water table in many parts of the country.

3. Upgrading Storage structures for freshwater and Drainage systems for wastewater.

4. Conservation of Wetlands

Wetlands provide a range of ecological services including water conservation, recharge of ground water and preservation of flora and fauna, including species and varieties at risk and are a source of livelihood to many.

5. Development of Desalination Technologies

In India, desalination has been recognized as a possible means to augment the water supply through natural resources for meeting the growing needs of water due to population and industrial growth. Since desalination is an energy intensive process, the application of desalination technology for increasing regional water supplies strongly links to energy issues and thus GHG emissions.

5. National Mission for Sustaining the Himalayan Ecosystem

The Mission aims to evolve management measures for sustaining and safegaurding the Himalayan glacier and mountain eco-system. It will try to conserve biodiversity, forest cover, and other ecological values in the Himalayan region, where glaciers that are a major source of India's water supply are projected to recede as a result of global warming. An observational and monitoring network for the Himalayan environment will also be established to assess freshwater resources and health of the eco-system.

Community based management of the Himalayan Eco-system will be promoted with incentives to community organisations and panchayats for protection and enhancement of forested lands.

6. National Mission for creating a "Green India"

This Mission will be launched to enhance ecosystem services including carbon sinks.

Forests play an indispensible role in the preservation of ecological balance and the maintenance of biodiversity. Forests are repositories of genetic diversity, and supply a wide range of ecosystem services thus helping maintain ecological balance. Forests separate billions of tonnes of carbon dioxide in the form of biomass and soil carbon.

The Prime Minister has already announced a Green India Campaign for the afforestation of 6 million hectares and expanding forest cover from 23% to 33% of India's territory.

This mission will be taken up on degraded forest land, through direct action by communities, organized through Joint Forest Management Committees and guided by the Departments of Forests in State Governements.

The National Mission for a "Green India" will focus on 2 objectives:

1. Increasing the Forest Cover and Density as a whole for the country
2. Conserving Biodiversity

7. National Mission for Sustainable Agriculture

The Mission will devise strategies to make Indian agriculture more resilient to climate change.

The mission aims to identify and develop new varieties of crops especially climate-resilient crops which will support climate adaptation in agriculture. New credit and insurance mechanisms will be devised. The focus will be on improving the productivity of rainfed agriculture.

8. National Mission on establishing a Strategic Knowledge Platform for Climate Change.

To gain a better understanding of climate science, impacts and challenges, the plan envisions a new Climate Science Research Fund to be created to support research , improved climate modeling, and increased international collaboration. It also encourage private sector initiatives to develop adaptation and mitigation technologies through venture capital funds.

The Mission will also support the establishment of dedicated climate change related academic units in Universities and and other academic and scientific research Institutions across the country which would be networked.

This National Mission will include the following key themes:

1. Research in key substantive domains of climate science like monsoon dynamics, aerosol science and ecosystems responses
2. Global and regional climate modelling
3. Strenghthening data gathering and assimilation measures
4. creation of essential research infrastructure

Status of Implementation of National Missions under NAPCC

1. National Solar Mission
[Concerned Ministry – Ministry of New and Renewable Energy]

Solar Renewable Purchase Obligations (RPOs) have been mandated. NTPC Vidyut Vyapar Nigam (NVVN), an organisation working outside the government, is incorporated to oversee the mission. Limited progress has taken place in off-grid solar, but otherwise there has been good, if not robust, progress. Reverse auctioning has been completed for on-grid power for both solar thermal (470 MW) and solar PV (150 MW) in the first round and the remaining 350 MW in the second. In the Rooftop PV and Small Solar Power Generation Programme (RPSSGP), 64.55 MW (against a target of 98.05 MW) has been commissioned; 11 solar PV projects (totalling 48 MW capacity) and one solar thermal project (with 2.5 MW capacity) have come under the Migration Scheme. Furthermore, projects of 40 MW Solar PV capacity for localised off-grid applications were approved (against 32 MW target), 22 companies provide consumers the opportunity to purchase solar products at low costs through loans. Solar thermal collectors with an area of 5 million sq. mt. have been installed.4 9 projects are under implementation for R&D. Solar Energy Research Advisory Council (SERAC) and Solar Energy Industry Advisory Council (SEIAC) have been set up. There is limited progress with co-benefits because they were not prioritised. Prices have dropped and constraints have been handled so far.

2. National Mission on Enhanced Energy Efficiency
[Concerned Ministry - Bureau of Energy Efficiency, Ministry of Power]

The Partial Risk Guarantee Fund (PRGF) and the Venture Capital Fund for Energy Efficiency (VCFEE) are almost set up. The Perform Achieve Trade (PAT) scheme has been notified though it has been delayed. Under PAT, Specific Energy Consumption (SEC) targets have been set for 478 Designated Consumers (DCs) across 8 sectors, with the targets to be achieved by 2014-15. It has a built-in verification process. With regard to institutional arrangements there has been progress on some aspects such as the Renewable Energy Certificate (REC) scheme and financial instruments with private investors. Energy Efficiency Services Ltd. (EESL), a joint venture of four Central Public Sector Undertakings CPSUs [National Thermal Power Corporation Ltd (NTPC), Power Grid Corporation of India Ltd (PGCIL), Power Finance Corporation Ltd. (PFC) and Rural Electrification Corporation Ltd. (REC), was incorporated as a business entity on 11th February 2010 to facilitate implementation of energy efficiency

projects. Under the Market Transformation for Energy Efficiency (MTEE), Bureau of Energy Efficiency (BEE) has completed consultation with fan manufacturers and other stakeholders and framed standards and a verification-based incentive structure to create super-efficient fans.

3. National Mission on Sustainable Habitat
[Concerned Ministry – Ministry of Urban Development]

Demonstration/pilot projects for sustainable waste management have been drawn up although approval from the Expenditure Finance Committee/Cabinet is pending. Proposals are being developed to support pilot/demonstration projects for promoting sustainable habitat to the extent of about 10% of the capital cost, for best practices related to energy efficiency. Sub-committees for setting NMSH standards/benchmarks for urban local bodies on Municipal Solid Waste Management, Urban Storm Water Management, Urban Water Supply and Sewerage, Urban Planning and Urban Transport were formed. Each sub-committee has submitted an individual report. Provision of Rs. 26,000 crores has been made for urban local bodies under the 13th Finance Commission.

4. National Water Mission
[Concerned Ministry - Ministry of Water Resources]

Some effort is being made to integrate this mission into the 12th plan, but many of the changes would have happened even without the mission since there is a lot of dynamism in the sector. A 'Draft National Water Policy (2012)' was released. A report titled 'Draft Guidelines for Development of Water Use Efficiency in Rural, Urban, Industrial and Irrigation Sector' has been released for inviting comments and suggestions. A web-enabled 'Water Resources Information System of India' (India-WRIS) was launched by the Central Water Commission(CWC) and Indian Space Research Organisation (ISRO). A pilot project for comprehensive assessment of groundwater resources through aquifer mapping in 5 blocks has been initiated. The Ministry of Water Resources has released a two-volume document titled 'Restructuring of Central Water Commission' in May 2011 and has invited public comments.

5. National Mission for Sustaining the Himalayan Ecosystem
[Concerned Ministry - Department of Science & Technology, Ministry of Science and Technology]

The Expert Committee set up for the preparation of a Detailed Project Report (DPR) on the proposed National Centre for Himalayan Glaciology has submitted its report. A Kailash landscape protection project has been initiated by the Ministry of Environment and Forests (MoEF) in collaboration with China, Nepal, International Centre for Integrated Mountain Development (ICIMOD) and United Nations Development Programme (UNDP) on 9th April 2010. A document titled 'Governance for Sustaining Himalayan Ecosystem: Guidelines and Best Practices (G-SHE)' was released in September 2009.

6. National Mission for creating a "Green India"
[Concerned Ministry – Ministry of Environment And Forests]

The preparatory stage for implementation is currently underway. Workshops were held to prepare and discuss guidelines at the national and landscape levels. The guidelines are a precursor to the final operational guidelines/manual for the Green India Mission (GIM). The guidelines, issued in the form of three advisories between November 2011 and January 2012, are on (a) selecting landscapes and operational units, (b) operations to be undertaken after short-listing landscapes/sub-units and (c) funding of the Green India Mission. The advisories create the scope for pilot implementation including capacity building, baseline studies and institutional revamping or strengthening. Based on these advisories, states are expected to have submitted a Bridge Plan by the end of 2011 and the Perspective Plan for the next five or ten years is to be presented by the end of February 2012. State governments are to identify land for pilot projects and proactively seek funding. A total of Rs. 4,500 crores per year has been earmarked for the GIM, and gaps in requirement, if any, will have to be met from external funding. For the Bridge Plan, the Ministry of Finance has allocated Rs. 500 crores from the National Clean Energy Fund towards the activities of the GIM. However, a fund allocation of Rs. 200 crores from the National Clean Energy Fund was announced in the Union Budget 2011-12 to begin its implementation.

7. National Mission for Sustainable Agriculture
[Concernerd Ministry - Ministry of Agriculture]

The NMSA is designed to be made operational by mainstreaming adaptation and mitigation strategies in on-going research and development programmes and in flagship schemes including the Rashtriya Krishi Vikas Yojana (RKVY), National Horticulture Mission (NHM), National Food Security Mission (NFSM) and National Agricultural Insurance Scheme (NIAS). As the NMSA is not a stand-

alone mission, the Department of Agriculture and Cooperation does not feel the need to set up a Mission Directorate, at least for the time being. Some flagship schemes have been recommended for expansion taking the NMSA into consideration. For instance, the Modified National Agricultural Insurance Scheme (MNIAS) has been approved and takes into account some recommendations provided by the NMSA, such as the calculation of threshold yield. The Indian Council of Agricultural Research is undertaking the National Initiative on Climate Resilient Agriculture (NICRA) which seeks to scale up outputs both through Krishi Vigyan Kendras and the NMSA for wider adoption by farmers. Components of the NICRA scheme include strategic research on adaptation and mitigation for which institutions and research areas have been identified, and technology demonstration to cope with current climate variability in 100 vulnerable districts. A sum of Rs. 350 crores has been allocated for NICRA.

8. National Mission on establishing a Strategic Knowledge Platform for Climate Change

[Concerned Ministry - Department of Science & Technology, Ministry of Science and Technology]

Building Human and Institutional Capacities, a focus of the mission, was launched with SCOPUS data providing a list of 100 institutes and 100 scientists, of which 30 institutes were invited to submit proposals for 15 topics in four broad categories: establishing and strengthening a Centre for Excellence (CfE), strengthening major programmes and building human capacity. Of the 29 proposals received from 19 institutions, 14 were selected (including proposals to set up 2 CfEs by the Indian Institute of Technology Bombay and the International Crops Research Institute for the Semi-Arid-Tropics (ICRISAT), which have been launched, while the rest have been initiated funds and sanctions have been released till 31 March 2012. At least two thematic knowledge networks have been set up so far. A National Data Sharing and Access Policy (NDSAP) has also been launched. Indian Network for Climate Change Assessment (INCCA) has released "Climate Change and India: A 4X4 assessment" to address concerns regarding the effects of climate change on natural resources and livelihoods. The process of formulating Professor-Chairships for the next 5 years has been initiated.

ENERGY CONSERVATION

Energy and environment are essential for sustainable development. The poor are disproportionately affected by environmental degradation and lack of access to clean, affordable energy services.

Section 2(h) of the Energy Conservation Act 2001, defines 'Energy' as –
"Energy means any form of energy derived from fossil fuels, nuclear substances or materials, Hydro-electricity and includes electrical energy or electricity generated from renewable sources of energy or biomass connected to the grid."

About 20% of worlds energy is generated from coal and about 60% of worlds energy is generated from oil and natural gas. Because of extensive use of fossil fuel, such as coal, oil and natural gas, as primary source of energy today, the harmful emissions of GHG (Green House Gasses) such as Carbon Dioxide increases the GHG level and causes the Greenhouse Effect and eventually global warming.

Meaning of Energy Conservation

Energy conservation is the practice of decreasing the quantity of energy used. It can be achieved through efficient energy use, where energy use is decreased while achieving a similar outcome, or by reduced consumption of energy services. By reducing emissions, energy conservation is an important part of lessening climate change.

Energy conservation facilitates the replacement of non-renewable resources with renewable energy. Energy conservation is often the most economical solution to energy shortages, and is a more environmentally benign alternative to increased energy production.

Thus energy conservation has emerged as one of the major issues in recent years. Energy requirement in our country is increasing at a very rapid rate. India's demand for commercial energy in 2020 is expected to increase by 250% from today's level. Coal accounts for about 50% of primary commercial energy today and is further increase its share. Despite its low per capita CO 2 emission of less than 1 ton, India contributed over 4% of world total CO 2 emission in 2000.

The Energy Conservation Act 2001

Considering the vast potential of energy savings and benefits of energy efficiency, the Government of India enacted the Energy Conservation Act, 2001 (52 of 2001).

It was enacted in October 2001 but became effective from 1st March, 2002.

The Act provides for the legal framework, institutional arrangement and a regulatory mechanism at the Central and State level to embark upon energy efficiency drive in the country.

Measures Proposed by the Act

SHORT TERM MEASURES

1.Energy Conservation

Bureau of Energy Efficiency operationalized Complete pilot phase of programme for energy efficiency in government buildings and prepare action plan for wider dissemination and implementation.

2. Energy audit of government buildings

Energy Audit completed for nine govt. buildings.
Legal Performance contract agreement, payment security mechanism, bids selection and evaluation criteria provided to all building owners for implementation.
Five Building owners have floated tenders.
Monitoring and verification of energy savings from March 2005.

3. Capacity building amongst departments to take up energy efficiency programmes

BEE to train core group members to implement energy efficiency in buildings.

LONG TERM MEASURES

Potential of 23,700 MW assessed by end of XIth Plan

The Thrust Areas :

1. Industry specific Task Forces.

2. Notifying more industries as designated consumers.

3. Conduct of energy audit amongst notified designated consumers.

4. Recording and publication of best practises (sectorwise).

5. Development of energy consumption norms.

6. Monitoring of compliance with mandated provision by designated consumers.

Framework of the Act

The Energy Conservation Act, 2001 is An Act to provide for efficient use of energy and its conservation and for matters connected therewith or incidental thereto.

The Act is divided into 10 chapters, comprising of 62 sections and one Schedule.

Chapter I: Preliminary
Chapter II: Bureau of Energy Efficiency
Chapter III: Transfer of assets, liabilities etc. of Energy Management Centre to Bureau
Chapter IV: Powers and functions of Bureau
Chapter V: Power of Central Government to facilitate and enforce efficient use of energy and its conservation
Chapter VI: Power of State Government to facilitate and enforce efficient use of energy and its conservation
Chapter VII: Finance, Accounts and Audit of Bureau
Chapter VIII: Penalties and Adjudication
Chapter IX: Appellate Tribunal for Energy Conservation
Chapter X : Miscellaneous

The Schedule : List of Energy Intensive Industries and other establishments specified as designated consumers.

Salient features of the Energy Conservation Act 2001

The Act empowers the Central Government and, in some instances, State Governments to:

- specify energy consumption standards for notified equipment and appliances;

- direct mandatory display of label on notified equipment and appliances;
- prohibit manufacture, sale, purchase and import of notified equipment and appliances not conforming to energy consumption standards;
- notify energy intensive industries, other establishments, and commercial buildings as designated consumers;
- establish and prescribe energy consumption norms and standards for designated consumers;
- prescribe energy conservation building codes for efficient use of energy and its conservation in new commercial buildings having a connected load of 500 kW or a contract demand of 600 kVA and above;
- direct designated consumers to -

o designate or appoint certified energy manager in charge of activities for efficient use of energy and its conservation;

o get an energy audit conducted by an accredited energy auditor in the specified manner and interval of time;

o furnish information with regard to energy consumed and action taken on the recommendation of the accredited energy auditor to the designed agency;

o comply with energy consumption norms and standards;

o prepare and implement schemes for efficient use of energy and its conservation if the prescribed energy consumption norms and standards are not fulfilled;

- get energy audit of the building conducted by an accredited energy auditor in this specified manner and intervals of time;

State Governments may –

o amend the energy conservation building codes prepared by the Central Government to suit regional and local climatic conditions;

o direct every owners or occupier of a new commercial building or building complex being a designated consumer to comply with the provisions of energy conservation building codes;

o direct, if considered necessary for efficient use of energy and its conservation, any designated consumer to get energy audit conducted by an accredited energy auditor in such manner and at such intervals of time as may be specified;

Energy intensive Industries

The Schedule to the Energy Conservation Act, 2001 gives the List of Energy Intensive Industries and other establishments specified as designated consumers.

However, the Central government has, vide its notification published in the Gazette of India dated 19th March,2007 in exercise of the powers conferred by the clauses (e) and (f) of section 14 of the Energy Conservation Act,2001, in consultation with the Bureau of Energy Efficiency, altered the List of Energy Intensive Industries and other establishments specified in the Schedule to the said Act.

As per the Notification, The Central Government notifies 9 energy intensive industries as designated consumers under The EC Act 2001:

1) Thermal Power Stations - 30,000 metric tonne of oil equivalent (MTOE) per year and above
2) Fertilizer - 30,000 metric tonne of oil equivalent (MTOE) per year and above
3) Cement - 30,000 metric tonne of oil equivalent (MTOE) per year and above
4) Iron & Steel - 30,000 metric tonne of oil equivalent (MTOE) per year and above
5) Chlor-Alkali - 12,000metric tonne of oil equivalent (MTOE) per year and above
6) Aluminium - 7,500 metric tonne of oil equivalent (MTOE) per year and above
7) Railways - electric traction Sub-Section(TSS),diesel loco shed, Production units and Workshops of Indian Railways having total annual energy consumption of 30,000 MTOE or more under Ministry of Railways (as per table given in the Notification)
8) Textile - 3,000 metric tonne of oil equivalent (MTOE) per year and above
9) Pulp & Paper - 30,000 metric tonne of oil equivalent (MTOE) per year and above
Energy Conversion values used for working out annual energy consumption in terms of metric tonne of oil equivalant

For the purpose of this table

i) 1 Kg of Oil Equivalant :10,000 kcal
ii) 1 Metric Tonne of Oil Equivalant (MTOE) : 10 x 106 kcal
iii) In case of coal, petroleum products and other fuels in absence of supplier certificate, GCV of the above fuel (fuel sample) will be considered as per the test Certificate from a NABL Accredited Lab or State Government Lab or Gov. recoganised Lab .

Establishment of Bureau of Energy Efficiency

The Bureau of Energy Efficiency (BEE) is a statutory Body under the Ministry of Power, Government of India established under the provisions of the Energy Conservation Act, 2001. Under the provisions of the Act, Bureau of Energy Efficiency has been established with effect from 1st March, 2002.

The Bureau would be responsible for spearheading the improvement of energy efficiency of the economy through various regulatory and promotional instruments. The BEE has published specifications of several electrical equipments and appliances on energy efficiency.

The Bureau shall be a body corporate having perpetual succession and a common seal, with power subject to the provisions of this Act, to acquire, hold and dispose of property, both movable and immovable, and to contract, and shall, by the said name, sue or be sued.

The head office of the Bureau shall be at Delhi. The Bureau may establish offices at other places in India.

The Director-General is the chief executive officer of the Bureau of Energy Efficiency.

The Energy Conservation Building Codes (ECBC)

The BEE launched the Energy Conservation Building Code (ECBC) on 27th May 2007 in New Delhi.

This code addresses the design of new, large commercial buildings to optimize the building's energy demand. Commercial buildings are one of the fastest growing sectors of the Indian economy, reflecting the increasing share of the services sector in the economy.

Nearly one hundred buildings are already following the Code, and compliance with it has also been incorporated into the Environmental Impact Assessment requirements

The Energy Conservation Building Codes under the Act are aimed at achieving total energy efficiency in buildings and establishments.

The new buildings are required to be designed and built with energy efficiency consideration right from the initial stages itself. The development of energy conservation building codes is necessary for this purpose. The codes would be applicable to commercial buildings constructed after the relevant rules are notified under the Energy Conservation Act. The Bureau would constitute Committee of Experts for preparation of Energy Conservation Building Codes for different climatic zones.

ECBC norms will be implemented on a voluntary basis initially and then made mandatory.

Under the EC Act 2001
Power of BEE:

Under Section 13(d) of the Act, the BEE may perform the function of taking suitable steps to prescribe guidelines for energy conservation building codes under clause (p) of section 14.

Power of Central Government to enforce efficient use of energy and its conservation:

The Central Government may by notification, in consultation with the BEE -
Under Section 14(p) - prescribe energy conservation building codes for efficient use of energy and its conservation in the building or building complex;
Under Section 14(q) amend the energy conservation building codes to suit the regional and local climatic conditions;
Under Section 14(r) direct every owner or occupier of the building or building complex, being a designated consumer to comply with the provisions of energy conservation building codes for efficient use of energy and its conservation;

Aim of ECBC:
The ECBC aims at increasing awareness about efficient use of energy and its conservation in new commercial buildings with a connected load of 500kW or contract demand of 600KVA.

ECBC incorporates energy efficiency factors at the design stage itself to reduce the long term operating energy costs of the buildings.

What does ECBC do?:

ECBC defines the norms of energy requirement per sq. metre of area and takes into consideration the climatic region of the country, where the building is located. Norms have been developed to cater to 5 different climate zones in India- Composite; Hot and Dry; Warm and Humid; Moderate; and Cold.

What is Included in ECBC:
The Government has introduced Energy Conservation Codes for commercial buildings.

ECBC details the parameters of various building materials to be used in walls, windows, glass, ceilings and floors to minimize heat gain and thus the cooling cost.

ECBC also covers Lighting, Heating, Ventilation, Air-Conditioning, Electrical Distribution, Water Heating and Pumping Systems.

Savings
If the nearly 21.50 million sq mtrs of commercial space constructed in India every year conforms to ECBC norms, energy consumption can be cut down by 30-40%, which will result in a saving of approx. Rs.1000 crores in capital investment in a 250MW power plant plus 1.7 billion units of electricity annually every year.

Designated Consumers (DCs)

Under Section 2(g) of the Energy Conservation Act,2001 "designated consumer" means any consumer specified under clause (e) of section 14 of the Act.

Section 14(e) says - The Central Government may, by notification, in consultation with the Bureau, specify, having regarding to the intensity or quantity of energy consumed and the amount of investment required for switching over to energy efficient equipments and capacity or industry to invest in it and availability of the energy efficient machinery and equipment required by the industry, any user or class of users of energy as a designated consumer for the purposes of this Act.

The Schedule to the Act provides a list of the Designated Consumers. These DCs have to :
1. Appoint/Designate Energy Managers
2. Get Energy Audit conducted by Accredited Energy Auditors
3. Implement Techno-Economic Viable Recommendations

4. Comply with norms of specific energy consumption fixed
5. Submit Report on Steps Taken

Labeling Programme for Appliances

An energy labeling programme for appliances was launched in 2006, and comparative starbased labeling has been introduced for fluorescent tubelights, air conditioners, and distribution transformers.

The labels provide information about the energy consumption of an appliance, and thus enable consumers to make informed decisions. Almost all fluorescent tubelights sold in India, and about two-thirds
of the refrigerators and air conditioners, are now covered by the labeling programme.

Energy Managers and Energy Auditors

Under the EC Act, 2001 it is mandatory for the designated consumers to get energy audit conducted by an "accredited energy auditor" (under clause 14(h) and 14(i)) and to designate or appoint an energy manager (under clause 14(1)).

The BEE is empowered to specify the regulations and mechanism to meet the above objective. It has been decided that prescribed qualification for energy manager will be the passing of certification examination to be arranged by the Bureau. Also, regular accreditation is proposed to be given to energy audit firms having a pool of certified energy auditors.

BEE has retained the National Productivity Council (NPC) as the National Certifying Agency on the advise of the Governing Council of the BEE, for conducting the National Certification Examination for Energy Managers and Energy Auditors under the aegis of BEE.

A Board of Examination was constituted by BEE for this purpose comprising of 6 members under the Chairmanship of Ex-Chairman, CEA and Members from CII, PCRA, AICTE,BEE and NPC.

To qualify as Energy Manager, a candidate has to pass 3 papers of Written Examinations.

To qualify as Energy Auditor, a candidate has to pass 4 papers of Written examinations and a VIVA examination.

Energy Audits of Large Industrial Consumers:

Energy audit studies conducted in several office buildings, hotels and hospitals in India indicate energy saving potential of 20-30%. The potential is largely untapped, partly due to lack of an effective delivery mechanism for energy efficiency.

Government buildings by themselves, constitute a very large target market. The Government of India is committed to set an example by implementing the provisions of the EC Act in all its establishments as a first initiative.

To begin with, the Bureau has begun conduct of energy audit in the Rashtrapathi Bhawan, Parliament House, South Block, North Block, Shram Shakti Bhawan, AIIMS, Safdarjung Hospital, Delhi Airport, Sanchar Bhawan, and RailBhawan. Energy audit in the Rashtrapati Bhawan PMO, S S Bhawan, Sanchar Bhawan & Rail Bhawan has been completed

In March 2007, the conduct of energy audits was made mandatory in large energy-consuming units in nine industrial sectors. These units, notified as "designated consumers" are also required to employ "certified energy managers", and report energy consumption and energy conservation data annually.

Indian Energy Exchange (IEX)

Indian Energy Exchange Limited (IEX) is India's first-ever, nationwide, automated, and online electricity trading platform. It has been conceived to catalyse the modernisation of electricity trade in the country by ushering in a transparent and neutral market through a technology-enabled electronic trading platform.

CENTRAL ELECTRICITY REGULATORY COMMISSION (CERC) accorded approval on 9th June 2008, to IEX to commence its operations. IEX is a demutualised exchange that will enable efficient price discovery and price risk management in the electricity market.

On 6th February 2007, the CERC issued guidelines for grant of permission to set up power exchanges in India. Financial Technologies (India) Ltd responded by proposing then tentatively named 'Indian Power Exchange Ltd' and applied for

permission to set it up and operate it within the parameters defined by CERC and other relevant authorities. Based on the oral hearing on July 10, the CERC accorded its approval vide its order dated 31st August, 2007. IEX thus moved from the conceptual level to firmer grounds. On 9th June 2008 CERC accorded approval to IEX to commence its operations and 27th June 2008 marked its presence in the history of Indian Power Sector as Indian Energy Exchange Ltd (IEX), India's first-ever power exchange.

Regulator of IEX:
CENTRAL ELECTRICITY REGULATORY COMMISSION (CERC)

Promoters of IEX:

IEX is promoted by Financial Technologies (India) Ltd, and PTC India Ltd.

Financial Technologies (India):
Financial Technologies has a 90% share of the electronic exchange and online brokerage solutions market in India. The company's solutions power six exchanges and 750 out of the 800-odd brokerage houses operating over 1,40,000 trading terminals on a daily basis. IEX will be the seventh exchange to be powered by Financial Technologies.

PTC India:
A public-private partnership initiated by the government of India, whose primary focus is to develop a commercially vibrant power market in the country. It has pioneered power trading in India and is presently the leading power trading company with a market share of 44% (2006-2007)

Stakeholders in IEX:

There are a number of key stakeholders in IEX:

1. Infrastructure Development Finance Company (IDFC):
A private sector enterprise formed by a consortium of public and private investors, IDFC is a specialised financial intermediary for infrastructure. It provides financial assistance to projects in power, roads, ports, and telecommunications.

2. Adani Enterprises:

Part of the Adani group of companies, Adani Enterprises is active in the power trading business across the country. It is implementing mega thermal power projects at various locations in India. It aims to enter into power transmission in a big way.

3. Reliance Energy:
India's largest integrated private sector power utility company, Reliance Energy is into generation, transmission, distribution, and trading of power. It is also an investor in infrastructure projects including the prestigious Mumbai metro rail project and various road projects of the National Highways Authority of India.

4. Lanco Infratech:
With more than two decades of experience in power generation, power trading, construction and EPC, infrastructure and property development, Lanco Infratech's expertise in power encompasses conventional as well as non-conventional sources of energy such as gas, coal, biomass, hydro, and wind. It is also one of the top three power trading companies in the country.

5. Rural Electrification Corporation (REC):
A wholly public sector enterprise, REC's main objective is to finance and promote electrification projects in villages all over India. It provides financial assistance to state electricity boards, state government departments, and rural electricity cooperatives for rural electrification projects.

6. Tata Power Company:
Pioneers of electricity generation in India, Tata Power is the country's largest private sector power utility. It has successfully served customers in Mumbai for over 90 years and has now spread its operations across the nation. Tata Power has generation units in Mumbai, Delhi, Jojobera, Jharkhand, and Karnataka.

<u>Technology Support to IEX:</u>
OMX Technology, Sweden, the technology provider to the world's leading power exchange, NORDPOOL, has joined hands with Financial Technologies (India) Ltd to provide technology support to Indian Energy Exchange (IEX). OMX is a leading expert in the exchange industry. It owns exchanges in the Nordic and Baltic regions, and develops and provides technology and services to

companies in the securities industry around the globe. In power trading, OMX is a pioneer, with four power exchanges in Europe currently using its technology.

ENVIRONMENTAL LAWS AND GREEN AUDIT

Laws and regulations are a major tool in protecting the environment. To put those laws into effect, government agencies create and enforce regulations. Environmental law is a complex and interlocking body of statutes, common law, treaties, conventions, regulations and policies which, very broadly, operate to regulate the interaction of humanity and the rest of the biophysical or natural environment, toward the purpose of reducing or minimizing the impacts of human activity, both on the natural environment for its own sake, and on humanity itself.

The Indian constitution is amongst the few in the world that contains specific provisions on environment protection. In the Constitution of India it is clearly stated that it is the duty of the state to 'protect and improve the environment and to safeguard the forests and wildlife of the country'. It imposes a duty on every citizen 'to protect and improve the natural environment including forests, lakes, rivers, and wildlife'. Reference to the environment has also been made in the Directive Principles of State Policy as well as the Fundamental Rights.

Green Audit

Green audit is all about corporate responsibility. It uncovers the truth about statements made by governments and companies with regard to the effects of environmental pollution. The aim of Green Audit is to review the measures taken by the company to combat pollution. Green audit is defined as an official examination of the effects a company has on the environment. It is also widely known as Environmental Audit.

Green audit can also be described as the inspection of a company to assess the total environmental impact of its activities or of a particular product or process. It covers not only the technical aspects but also the legal aspects. Green audit also checks if the environment laws applicable to a company are complied with.

Green audit also refers to the monitoring of environmental management system of the Unit, checking the status of consent orders, compliance of consent orders, water cess, other legal requirements, industrial data collection regarding product process, electric consumption, water consumption, raw materials and energy balance etc.

According to the World Bank, environmental audit is a methodical examination of environmental information about an organization, a facility or a site, to verify

whether, or to what extent, they conform to specified audit criteria. The criteria may be based on local, national or global environmental standards.

Compliance of Environmental laws

Organisations have a legal and moral duty to comply with environmental laws and regulations. Regulatory compliance is society's licence to operate. Given the complexity of legal requirements regarding environmental protection this indeed is a significant challenge for organisations. The first difficulty comes from finding out what laws and regulations actually apply; followed by the need to understand how they apply and what needs to be done to comply and ensure compliance on an ongoing basis.
Compliance of environment laws under Green Audit should cover the following –

- National Environment Laws, Rules and Regulations;
- Notifications issued by the Government and the agencies under them;
- Standards issued by responsible bodies such as those for Environment Impact Assessments (EIA), ISO 14001 for Environment Management System, pollution control orders and standards issued by oversight and implementation bodies such as CPCB etc.;
- Sanctions and permits issued in respect of the entity by the regulatory bodies concerned;
- EIA reports, reviews by independent organisations, company's environment policy etc.

Green Audit Report

The Audit report should be complete, precise, accurate and balanced. It should contain constructive and precise recommendations. It must be persuasive and instrumental in inspiring the managements of entities to take corrective actions. The violations and omissions should also be effectively mentioned in the report. Last but not the least, the contents of green audit report should be easy to understand and free from vagueness or ambiguity, include information which is supported by complete and relevant audit evidence and be independent, objective fair and constructive.

Meaning of Environmental Law

Environmental law is a complex and interlocking body of statutes, common law, treaties, conventions, regulations and policies which, very broadly, operate to

regulate the interaction of humanity and the rest of the biophysical or natural environment, toward the purpose of reducing or minimizing the impacts of human activity, both on the natural environment for its own sake, and on humanity itself. This can be further divided into two major subjects – (1) pollution control and remediation and (2) resource conservation and management.

Laws dealing with pollution are often media-limited - i.e., pertain only to a single environmental medium, such as air, water (whether surface water, groundwater or oceans), soil, etc. - and control both emissions of pollutants into the medium, as well as liability for exceeding permitted emissions and responsibility for cleanup. Laws regarding resource conservation and management generally focus on a single resource - e.g., natural resources such as forests, mineral deposits or animal species, or more intangible resources such as especially scenic areas or sites of high archeological value - and provide guidelines for and limitations on the conservation, disturbance and use of those resources. These areas are not mutually exclusive - for example, laws governing water pollution in lakes and rivers may also conserve the recreational value of such water bodies. Furthermore, many laws that are not exclusively "environmental" nonetheless include significant environmental components and integrate environmental policy decisions.

Pollution control laws generally are intended to protect and preserve both the natural environment and human health. Resource conservation and management laws generally balance the benefits of preservation and economic exploitation of resources. From an economic perspective environmental laws may be understood as concerned with the prevention of present and future externalities, and preservation of common resources from individual exhaustion.

Sources of Environmental law

Sources of environmental law may be treaties, protocols, conventions, customary international law, judicial decisions etc.

International environmental agreements are generally multilateral (or sometimes bilateral) treaties. The majority of such conventions deal directly with specific environmental issues. There are also some general treaties with one or two clauses referring to environmental issues but these are rare. There are about 1000 environmental law treaties in existence today; no other area of law has generated such a large body of conventions on a specific topic. Protocols are subsidiary agreements built from a primary treaty. They exist in many areas of international law but are especially useful in the environmental field, where they may be used to regularly incorporate recent scientific knowledge. They also permit countries to reach agreement on a framework that would be contentious if every detail were to be agreed upon in advance.

Customary international law is an important source of international environmental law. These are the norms and rules that countries follow as a matter of custom and they are so prevalent that they bind all states in the world. Environmental law also includes the opinions of courts and tribunals. While there are few and they have limited authority, the decisions carry much weight with legal commentators and are quite influential on the development of environmental law. One of the biggest challenges in judicial decisions is to determine an adequate compensation for environmental damages.

United Nations Conference on Human Environment

The United Nations Conference on the Human Environment (UNCHE) (also known as the Stockholm Conference) was an international conference convened under United Nations auspices held in Stockholm, Sweden from June 5-16, 1972. It was the UN's first major conference on international environmental issues, and marked a turning point in the development of international environmental politics. The conference acknowledged that the goal of reducing human impact on the environment would require extensive international cooperation, as many of the problems affecting the environment are global in nature. Following this conference, the United Nations Environmental Programme (UNEP) was launched in order to encourage United Nations agencies to integrate environmental measures into their programs.

The conference was opened and addressed by the Swedish Prime Minister Olof Palme and Secretary-general Kurt Waldheim to discuss the state of the global environment. Attended by the representatives of 113 countries, 19 inter-governmental agencies, and more than 400 inter-governmental and non-governmental organizations, it is widely recognized as the beginning of modern political and public awareness of global environmental problems.

The meeting agreed upon a Declaration containing 26 principles concerning the environment and development; an Action Plan with 109 recommendations, and a Resolution.

The UNCHE emphasized that defending and improving the environment must become a goal to be pursued by all countries. The Stockholm Declaration and Action Plan defined principles for the preservation and enhancement of the natural environment, and highlighted the need to support people in this process. The Conference indicated that “industrialized” environmental problems, such as habitat degradation, toxicity and acid rain, were not necessarily relevant issues for all countries. In particular, development strategies were not meeting the needs of the poorest countries and communities.

Some of the specific issues addressed was the role which industrialized countries should have in the process of protecting the environment, stating that industrial countries should help to close the gap between them and underdeveloped countries while keeping their own priorities and the protection and improvement of the environment in mind. The conference developed a long set of recommendations to act as goals to pursue its mission. Recommendations included that governments communicate about environmental issues that have international implications (such as air pollution), that governments give attention to the training of those who plan, develop, and manage settlement areas, and that agencies work together to address many issues, such as access to clean water and population growth. However, it was the pending environmental problems that dominated the meeting and led to wider public environmental awareness.

One of the greatest achievements of the UNCHE was the creation of the United Nations Environment Programme (UNEP), based in Nairobi, Kenya. The mission of UNEP is "to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and people to improve their quality of life without compromising that of future generations." UNEP is the voice for the environment within the United Nations system and works toward this mission by:

- Encouraging international participation and cooperation in addressing environmental issues and environmental policy
- Monitoring the status of the global environment and interpreting environmental data collected
- Creating environmental awareness in governments, society, and the private sector
- Coordinating UN activities pertaining to the environment
- Developing regional programs for sustainability
- Helping environmental authorities, especially those in developing countries, form and implement policy
- Helping to develop international environmental law

Environmental Laws in India

The Indian constitution is amongst the few in the world that contains specific provisions on environment protection. In the Constitution of India it is clearly stated that it is the duty of the state to protect and improve the environment and to safeguard the forests and wildlife of the country. Article 48-A of our Constitution, reads as follows: "*The State shall endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country*".

Environmental protection is a fundamental duty of every citizen of this country under Article 51-A(g) of the Constitution which reads as follows: "*It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures.*"
Article 48-A of the Constitution comes under Directive Principles of State Policy and Article 51 A(g) of the Constitution comes under Fundamental Duties.

History of environmental law in India

Environmental considerations have been an integral part of the Indian culture. The need for conservation and sustainable use of natural resources has been expressed in Indian scriptures, more than three thousand years old and is reflected in the constitutional, legislative and policy framework as also in the international commitments of the country. Even before India's independence in 1947, several environmental legislations existed but the real impetus for bringing about a well-developed framework came only after the UN Conference on the Human Environment (Stockholm, 1972). Under the influence of this declaration, the National Council for Environmental Policy and Planning within the Department of Science and Technology was set up in 1972. This Council later evolved into a full-fledged Ministry of Environment and Forests (MoEF) in 1985 which today is the apex administrative body in the country for regulating and ensuring environmental protection. After the Stockholm Conference, in 1976, constitutional sanction was given to environmental concerns through the 42nd Amendment, which incorporated them into the Directive Principles of State Policy and Fundamental Rights and Duties.

Since the 1970s an extensive network of environmental legislation has grown in the country. The Ministry of Environment and Forests and the pollution control boards (CPCB i.e. Central Pollution Control Board and SPCBs i.e. State Pollution Control Boards) together form the regulatory and administrative core of the sector.

List of environmental laws of India

I. **General**

1) **The Environment (Protection) Act, 1986**
This Act is an umbrella legislation designed to provide a framework for the co-ordination of central and state authorities established under the Water (Prevention and Control) Act, 1974 and Air (Prevention and Control) Act, 1981. Under this Act, the central government is empowered to take measures necessary to

protect and improve the quality of the environment by setting standards for emissions and discharges; regulating the location of industries; management of hazardous wastes, and protection of public health and welfare. Several notifications have been issued by the Central Government under this Act for protection of ecologically-sensitive areas or issues guidelines for matters under the Act. Some of the important notifications issued under the Environment Protection Act, 1986 are:

a. *Coastal Regulation Zone Notification* (1991), which regulates activities along coastal stretches. As per this notification, dumping ash or any other waste in the CRZ (coastal regulation zone) is prohibited. The thermal power plants (only foreshore facilities for transport of raw materials, facilities for intake of cooling water and outfall for discharge of treated waste water/cooling water) require clearance from the Ministry of Environment and Forests.
b. *Dhanu Taluka Notification* (1991), under which the district of Dhanu Taluka has been declared an ecologically fragile region and setting up power plants in its vicinity is prohibited.
c. Environmental Impact Assessment Notification-2006 (in supersession of the notification S.O. 60 (E) dated the 27th January, 1994. This notification is under sub-rule (3) of Rule 5 of the Environment (Protection) Rules, 1986 for imposing certain restrictions and prohibitions on new projects or activities, or on the expansion or modernization of existing projects or activities based on their potential environmental impacts. Rule 5 of the Environment (Protection) Rules, 1986 deals with Prohibitions and restrictions on the location of industries and the carrying on processes and operations in different areas.

    - All projects listed under Schedule I require environmental clearance from the Ministry of Environment and Forests.

    - Projects under the delicenced category of the New Industrial Policy also require clearance from the Ministry of Environment and Forests.

    - All developmental projects whether or not under the Schedule I, if located in fragile regions must obtain Ministry of Environment and Forests' clearance.

- Industrial projects with investments above prescribed limit must obtain Ministry of Environment and Forests clearance and are further required to obtain a LOI (Letter Of Intent) from the Ministry of Industry, and an NOC (No Objection Certificate) from the State Pollution Control Board and the State Forest Department if the location involves forestland. Once the NOC is obtained, the LOI is converted into an industrial licence by the state authority.

- The notification also stipulates procedural requirements for the establishment and operation of new power plants. As per this notification, two-stage clearance for site-specific projects such as pithead thermal power plants and valley projects is required. Site clearance is given in the first stage and final environmental clearance in the second. A public hearing has been made mandatory for projects covered by this notification. This is an important step in providing transparency and a greater role to local communities.

d. *Ash Content Notification* (1997), required the use of beneficiated coal with ash content not exceeding 34% with effect from June 2001, (the date later was extended to June 2002). This applies to all thermal plants located beyond one thousand kilometres from the pithead and any thermal plant located in an urban area or, sensitive area irrespective of the distance from the pithead except any pithead power plant.
e. *Taj Trapezium Notification* (1998), provided that no power plant could be set up within the geographical limit of the Taj Trapezium assigned by the Taj Trapezium Zone Pollution (Prevention and Control) Authority.

2) **The Environment (Protection) Rules, 1986**

These rules lay down the procedure for setting standards of emission or discharge of environmental pollutants. The Rules prescribe the parameters for the Central Government, under which it can issue orders of prohibition and restrictions on the location and operation of industries in different areas. The Rules lay down the procedure for taking samples, serving notice, submitting samples for analysis and laboratory reports. The functions of the

laboratories are also described under the Rules along with the qualifications of the concerned analysts.

3) **Hazardous Waste (Management and Handling) Rules, 1989**
   This Rules provide the procedure to control the generation, collection, treatment, import, storage, and handling of hazardous wastes. Under this Rule, any Unit that generates, collects, treats, imports, stores or handles hazardous wastes should obtain authorisation, maintain necessary records and submit returns.
4) **The Manufacture, Storage, and Import of Hazardous Chemicals Rules, 1989**
   This Rules deals with manufacture, storage and import of hazardous chemicals and also inspection of industrial activity connected with hazardous chemicals and isolated storage facilities.
5) **The Manufacture, Use, Import, Export, and Storage of hazardous Micro-organisms/ Genetically Engineered Organisms or Cells Rules, 1989**
   This Rule was introduced with a view to protect the environment, nature, and health, in connection with the application of gene technology and microorganisms. Any person dealing with Micro-organisms, Genetically Engineered Organisms or Cells should obtain permission from the Department of Bio-Technology.
6) **The Public Liability Insurance Act, 1991**
   This Act provides for public liability insurance for the purpose of providing immediate relief to the persons affected by accident while handling any hazardous substance.
7) **The Biomedical waste (Management and Handling) Rules, 1998**
   This Rule binds all the health care institutions to streamline the process of proper handling of hospital waste such as segregation, disposal, collection, and treatment. Every institution dealing with bio-medical wastes beyond a prescribed limit should obtain authorization from the prescribed authority.
8) **The Environment (Siting for Industrial Projects) Rules, 1999**
   This rule lays down detailed provisions relating to areas to be avoided for siting of industries, precautionary measures to be taken for site selecting as also the aspects of environmental protection which should have been incorporated during the implementation of the industrial development projects.
9) **The Municipal Solid Wastes (Management and Handling) Rules, 2000**
   This Rule will apply to every municipal authority responsible for the collection, segregation, storage, transportation, processing, and disposal of municipal solid wastes.

10) **The Ozone Depleting Substances (Regulation and Control) Rules, 2000**

This Rule has been enacted for the regulation of production and consumption of ozone depleting substances.

11) **The Batteries (Management and Handling) Rules, 2001**

This Rule will apply to every manufacturer, importer, re-conditioner, assembler, dealer, auctioneer, consumer, and bulk consumer involved in the manufacture, processing, sale, purchase, and use of batteries or components so as to regulate and ensure the environmentally safe disposal of used batteries.

12) **The Noise Pollution (Regulation and Control) Rules, 2002**

This Rule lays down conditions that are necessary to reduce noise pollution, permit use of loud speakers or public address systems during night hours (between 10:00 p.m. to 12:00 midnight) on or during any cultural or religious festive occasion.

13) **The Biological Diversity Act, 2002**

This Act provides for the conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of the benefits arising out of the use of biological resources and knowledge associated with it.

14) **The National Green Tribunal Act, 2010**

National Green Tribunal has been established for effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto.

15) **Plastic Waste (Management and Handling) Rules, 2011**

16) **E-waste Management and Handling Rules 2011**

II. <u>Water</u>

17) The Easement Act, 1882

This Act allows private rights to use a resource that is, groundwater, by viewing it as an attachment to the land. It also states that all surface water belongs to the state and is a state property.

18) The Indian Fisheries Act, 1897

This Act establishes two sets of penal offences whereby the government can sue any person who uses dynamite or other explosive substance in any way (whether coastal or inland) with intent to catch or destroy any fish or poisonous fish in order to kill.

19) The Merchant Shipping Act, 1970

This Act aims to deal with waste arising from ships along the coastal areas within a specified radius.

20) Water (Prevention and Control of Pollution) Act, 1974

This Act represented India's first attempts to comprehensively deal with environmental issues. The Act prohibits the discharge of pollutants into water bodies beyond a given standard, and lays down penalties for non-compliance.
The CPCB (Central Pollution Control Board) was constituted under this act.
Consent of the State Pollution control Board should be obtained by an industrial establishment for discharge of sewage or trade effluents.

21) The Water (Prevention and Control of Pollution) Cess Act, 1977

This Act provides for the levy and collection of cess or fees on water consuming industries and local authorities.

22) The Water (Prevention and Control of Pollution) Cess Rules, 1978

This Rule contains the standard definitions and indicate the kind of and location of meters that every consumer of water is required to affix.

III. **Air**

23) The Air (Prevention and Control of Pollution) Act, 1981

The Act provides means for the control and abatement of air pollution. The Act seeks to combat air pollution by prohibiting the use of polluting fuels and substances, as well as by regulating appliances that give rise to air pollution. Under the Act establishment or operation of any industrial plant requires consent from state pollution control boards. The pollution control boards are also expected to test the air in air pollution control areas, inspect pollution control equipment, and manufacturing processes. To counter the problems associated with air pollution, ambient air quality standards were established, under the Act.

24) The Air (Prevention and Control of Pollution) Rules,1982

This Rule prescribes the procedure for conducting meetings of the boards, the powers of the presiding officers, decision-making, the quorum; manner in which the records of the meeting are to be set etc. They also prescribed the manner and the purpose of seeking assistance from specialists and the fee to be paid to them.

25) **The Air (Prevention and Control of Pollution) Union Territories Rules, 1983**
26) **The Atomic Energy Act, 1982**
This Act deals with the radioactive waste.

IV. **Forest and Wildlife**

27) **The Indian Forest Act, 1927**
It is one of the many surviving colonial statutes. It was enacted to 'consolidate the law related to forest, the transit of forest produce, and the duty leviable on timber and other forest produce'.
28) **The Indian Wildlife Protection Act, 1972 and The Wildlife (Protection) Rules, 1995**
It provides for the protection of birds and animals and for all matters that are connected to it whether it be their habitat or the waterhole or the forests that sustain them. There is a blanket ban on carrying out any industrial activity inside these protected areas. It provides for authorities to administer and implement the Act; regulate the hunting of wild animals; protect specified plants, sanctuaries, national parks and closed areas; restrict trade or commerce in wild animals or animal articles; and miscellaneous matters.
29) **Forest (Conservation) Act, 1980 and Forest (Conservation) Rules, 1981**
It provides for the protection of and conservation of forests. The Act restricts the powers of the state in respect of de-reservation of forests and use of forestland for non-forest purposes (the term 'non-forest purpose' includes clearing any forestland for cultivation of cash crops, plantation crops, horticulture or any purpose other than re-afforestation).

National Green Tribunal

The National Green Tribunal has been established on 18.10.2010 under the National Green Tribunal Act 2010 for effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto. It is a specialized body equipped with the necessary expertise to handle environmental

disputes involving multi-disciplinary issues. The Tribunal will not be bound by the procedure laid down under the Code of Civil Procedure, 1908, but shall be guided by principles of natural justice.

The Tribunal's dedicated jurisdiction in environmental matters shall provide speedy environmental justice and help reduce the burden of litigation in the higher courts. The Tribunal is mandated to make and endeavour for disposal of applications or appeals finally within 6 months of filing of the same. Initially, the NGT is proposed to be set up at five places of sittings and will follow circuit procedure for making itself more accessible. New Delhi is the Principal Place of Sitting of the Tribunal and Bhopal, Pune, Kolkata and Chennai shall be the other 4 place of sitting of the Tribunal.

India is the third nation after Australia and New Zealand to have specialized environment tribunals.

The National Green Tribunal Act, 2010

There are 38 sections under 5 chapters and 3 schedules.

- Chapter I – Preliminary
- Chapter II – Establishment of the Tribunal
- Chapter III – Jurisdiction, powers and proceedings of the Tribunal
- Chapter IV – Penalty
- Chapter V - Miscellaneous

Composition of Tribunal

a) One full time Chairperson;
b) Minimum ten and maximum twenty full time judicial members;
c) Minimum ten and maximum twenty full time expert members.

Term of office for chairperson, judicial member and expert member is five years.
If the Chairperson or judicial member was a judge of the Supreme Court, then he should not hold office after he has attained the age of 70 years. In case the Chairperson or judicial member was the Chief Justice or judge of a High Court, then he should hold office after he has attained the age of 67 years.
No expert member should hold office after he has attained the age of 65 years.

The Tribunal will have jurisdiction over the following enactments (Sec.14) –

1. The Water (Prevention and Control of Pollution) Act, 1974
2. The Water (Prevention and Control of Pollution) Cess Act, 1977
3. The Forest (Conservation) Act, 1980
4. The Air (Prevention and Control of Pollution) Act, 1981
5. The Environment (Protection) Act, 1986
6. The Public Liability Insurance Act, 1991
7. The Biological Diversity Act, 2002

The above Acts have been given in Schedule I of the National Green Tribunal Act, 2010.

Relief and compensation

Any application to the Tribunal for relief and compensation and restitution of property and environment should be made within a period of 5 years. (Sec.15(3))
An appeal from the order of the Tribunal should be filed to the Supreme Court within 90 days from the date of communication of the order of the Tribunal. (Sec.22)

Penalty

Any person who fails to comply with the order, award or decision of the Tribunal will be punishable with imprisonment for a term which may extend to 3 years or with fine which may extend to ten crore rupees and in case of continuing contravention, with additional fine which may extend to twenty five thousand rupees for every day during which such failure or contravention continues.
Any company who fails to comply with the order, award or decision of the Tribunal will be punishable with fine which may extend to twenty five crore rupees and in case of continuing contravention, with additional fine which may extend to one lakh rupees for every day during which such failure or contravention continues.

Pollution Control Authorities

1) Ministry of Environment and Forests

The Ministry of Environment & Forests (MoEF) is the nodal agency in the administrative structure of the Central Government for the planning, promotion, co-ordination and overseeing the implementation of India's environmental and forestry policies and programmes.

The primary concerns of the Ministry are implementation of policies and programmes relating to conservation of the country's natural resources including its lakes and rivers, its biodiversity, forests and wildlife, ensuring the welfare of animals, and the prevention and abatement of pollution. While implementing these policies and programmes, the Ministry is guided by the principle of sustainable development and enhancement of human well-being.

The Ministry also serves as the nodal agency in the country for the United Nations Environment Programme (UNEP), South Asia Co-operative Environment Programme (SACEP), International Centre for Integrated Mountain

Development (ICIMOD) and for the follow-up of the United Nations Conference on Environment and Development (UNCED). The Ministry is also entrusted with issues relating to multilateral bodies such as the Commission on Sustainable Development (CSD), Global Environment Facility (GEF) and of regional bodies like Economic and Social Council for Asia and Pacific (ESCAP) and South Asian Association for Regional Co-operation (SAARC) on matters pertaining to the environment.

The broad objectives of the Ministry are:

- Conservation and survey of flora, fauna, forests and wildlife
- Prevention and control of pollution
- Afforestation and regeneration of degraded areas
- Protection of the environment and
- Ensuring the welfare of animals

2) Central Pollution Control Board

The Central Pollution Control Board (CPCB), was constituted in September, 1974 under the Water (Prevention and Control of Pollution) Act, 1974. Further, CPCB was entrusted with the powers and functions under the Air (Prevention and Control of Pollution) Act, 1981.

The Central Pollution Control Board will be a body corporate having perpetual succession and a common seal with power to acquire, hold and dispose of property and to contract and may by the aforesaid name sue or be sued.

It serves as a field formation and also provides technical services to the Ministry of Environment and Forests of the provisions of the Environment (Protection) Act, 1986. Principal Functions of the CPCB, as spelt out in the Water (Prevention and Control of Pollution) Act, 1974, and the Air (Prevention and Control of Pollution) Act, 1981, (i) to promote cleanliness of streams and wells in different areas of the States by prevention, control and abatement of water pollution, and (ii) to improve the quality of air and to prevent, control or abate air pollution in the country.
CPCB along with its counterparts State Pollution Control Boards (SPCBs) are responsible for implementation of legislations relating to prevention and control of environmental pollution.

All members of the central board are appointed by the central government.

The central board will consist of the following members –

1) Full time chairman;
2) Central Government nominated officials not exceeding five;
3) Central Government nominated officials not exceeding five from amongst members of the State Boards;
4) Central Government nominated non-officials not exceeding three representing the interest of agriculture, fishery or industry or trade etc.
5) Two persons representing the companies or corporations owned, controlled or managed by the Central Government;
6) Full-time member-secretary, possessing qualifications, knowledge and experience of scientific, engineering or management aspects of pollution control, appointed by the Central Government

If, in the opinion of the central government, a member of the central board is, or has been, convicted of an offence which involves moral turpitude, he shall be disqualified of such a position.
If a member of the central board has so abused his position as a member as to render his continuance on the Board detrimental to the interest of the general public, in the opinion of the central government, he shall be disqualified of such a position. However, no order of removal shall be made unless the member concerned has been given a reasonable opportunity of showing cause against the same.

3) **State Pollution Control Board**

The State Government by notification in the official gazette constitutes a State Pollution Control Board.
With regard to a Union Territory, a state board is not constituted. The Central Pollution Control Board exercises the powers and performs the functions of a state board for that Union Territory. The central board may however, delegate all or any of its powers and functions to such person or body of persons as the central government may specify.
A Joint Board may also be constituted for a Union Territory through an agreement entered into by the central government and one or more state governments, or two or more state governments.
The State board will consist of the following members –

1) Whole-time or part-time Chairman;
2) State Government nominated officials not exceeding five;
3) State Government nominated officials not exceeding five from amongst members of the local authorities functioning within the State;
4) State Government nominated non-officials not exceeding three representing the interest of agriculture, fishery or industry or trade etc.
5) Two persons representing the companies or corporations owned, controlled or managed by the State Government;

6) Full-time member-secretary, possessing qualifications, knowledge and experience of scientific, engineering or management aspects of pollution control, appointed by the State Government

The State Pollution Control Board will be a body corporate having perpetual succession and a common seal with power to acquire, hold and dispose of property and to contract and may by the aforesaid name sue or be sued.

The State Pollution Cotnrol Board has the following powers –

- To obtain information;
- To carry out inspections;
- To collect samples;
- Analysis of samples;
- Report of analysis;
- Report to be used as evidence.

4) New Regulator for eco-clearance of projects

In a recent development, it is expected that an independent regulator - the National Environment Assessment and Monitoring Authority would be constituted to revamp the process of granting environmental clearance and help protect the ecology. This authority could lead to a complete change in the process of granting environmental clearances. Staffed by dedicated professionals, it will work on a full-time basis to evolve better and more objective standards of scrutiny.

A project titled 'Scope, Structure and Processes of National Environment Assessment and Monitoring Authority (NEAMA) was given by Ministry of Environment and Forests (MoEF) to IIT Delhi consortium and had the broad mandate for developing the objectives, structure and core processes of the proposed NEAMA.

Environment Impact Assessment

Environment Impact Assessment or EIA can be defined as the study to predict the effect of a proposed activity/project on the environment. A decision making tool, EIA compares various alternatives for a project and seeks to identify the one which represents the best combination of economic and environmental costs and benefits.

EIA systematically examines both beneficial and adverse consequences of the project and ensures that these effects are taken into account during project design. It helps to identify possible environmental effects of the proposed project,

proposes measures to mitigate adverse effects and predicts whether there will be significant adverse environmental effects, even after the mitigation is implemented. By considering the environmental effects of the project and their mitigation early in the project planning cycle, environmental assessment has many benefits, such as protection of environment, optimum utilisation of resources and saving of time and cost of the project. Properly conducted EIA also lessens conflicts by promoting community participation, informing decision makers, and helping lay the base for environmentally sound projects. Benefits of integrating EIA have been observed in all stages of a project, from exploration and planning, through construction, operations, decommissioning, and beyond site closure.

Evolution of EIA

EIA is one of the successful policy innovations of the 20th Century for environmental conservation. Thirty-seven years ago, there was no EIA but today, it is a formal process in many countries and is currently practiced in more than 100 countries. EIA as a mandatory regulatory procedure originated in the early 1970s, with the implementation of the National Environment Policy Act (NEPA) 1969 in the US. A large part of the initial development took place in a few high-income countries, like Canada, Australia, and New Zealand (1973-74). However, there were some developing countries as well, which introduced EIA relatively early - Columbia (1974), Philippines (1978).

The EIA process really took off after the mid-1980s. In 1989, the World Bank adopted EIA for major development projects, in which a borrower country had to undertake an EIA under the Bank's supervision.

History of EIA in India

The Indian experience with Environmental Impact Assessment began over 20 years back. It started in 1976-77 when the Planning Commission asked the Department of Science and Technology to examine the river-valley projects from an environmental angle. This was subsequently extended to cover those projects, which required the approval of the Public Investment Board. Till 1994, environmental clearance from the Central Government was an administrative decision and lacked legislative support.

On 27 January 1994, the Union Ministry of Environment and Forests (MEF), Government of India, under the Environmental (Protection) Act 1986, promulgated an EIA notification making Environmental Clearance (EC) mandatory for expansion or modernization of any activity or for setting up new

projects listed in Schedule 1 of the notification. Since then there have been 12 amendments made in the EIA notification of 1994.

The MEF then notified new EIA legislation in September 2006. The notification makes it mandatory for various projects such as mining, thermal power plants, river valley, infrastructure (road, highway, ports, harbours and airports) and industries including very small electroplating or foundry units to get environment clearance. However, unlike the EIA Notification of 1994, the new legislation has put the onus of clearing projects on the state government depending on the size/capacity of the project.

Certain activities permissible under the Coastal Regulation Zone Act, 1991 also require similar clearance. Additionally, donor agencies operating in India like the World Bank and the ADB have a different set of requirements for giving environmental clearance to projects that are funded by them.

The EIA process

The stages of an EIA process will depend upon the requirements of the country or donor. However, most EIA processes have a common structure and the application of the main stages is a basic standard of good practice.

The environment impact assessment consists of eight steps with each step equally important in determining the overall performance of the project. Typically, the EIA process begins with screening to ensure time and resources are directed at the proposals that matter environmentally and end with some form of follow up on the implementation of the decisions and actions taken as a result of an EIA report. The eight steps of the EIA process are presented in brief below:

- **Screening:** First stage of EIA, which determines whether the proposed project, requires an EIA and if it does, then the level of assessment required.
- **Scoping:** This stage identifies the key issues and impacts that should be further investigated. This stage also defines the boundary and time limit of the study.
- **Impact analysis:** This stage of EIA identifies and predicts the likely environmental and social impact of the proposed project and evaluates the significance.
- **Mitigation:** This step in EIA recommends the actions to reduce and avoid the potential adverse environmental consequences of development activities.

- **Reporting:** This stage presents the result of EIA in a form of a report to the decision-making body and other interested parties.
- **Review of EIA:** It examines the adequacy and effectiveness of the EIA report and provides the information necessary for decision-making.
- **Decision-making:** It decides whether the project is rejected, approved or needs further change.
- **Post monitoring:** This stage comes into play once the project is commissioned. It checks to ensure that the impacts of the project do not exceed the legal standards and implementation of the mitigation measures are in the manner as described in the EIA report.

SUSTAINABLE DEVELOPMENT AND SUSTAINABILITY REPORTING

Sustainable development is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for future generations.

The 1992 Earth Summit in Rio de Janeiro popularized the phrase sustainable development even as the definition of the term remained vague. The term was used by the Brundtland Commission which coined what has become the most often-quoted definition of sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs

The many definitions and frameworks of sustainable development that now exist share a number of basic principles including:

- Concern for the well-being of future generations;
- Awareness of the multi-dimensional impacts of any decision (broadly categorized as economic, environmental, social); and,
- The need for balance among the different dimensions across sectors (e.g. mining, manufacturing, transportation), themes (climate change, community cohesion, natural resource management) and scale (local, regional, national, international).

The elusive goal of sustainable development, or sustainability as it is also called, is to make decisions and carry out programs and projects in a manner that maximizes benefits to the natural environment and humans and their cultures and communities, while maintaining or enhancing financial viability.

Sustainability Reporting

Sustainability, in general terms, is the ability to maintain balance of a certain process or state in any system. It is now most frequently used in connection with biological and human systems.

Concerns about climate change have made sustainability a mainstream issue. Never before have the capital markets been so interested in how companies are approaching the challenges and opportunities associated with the environment, societal change and governance.

Sustainability Reporting has become mainstream, driven by the potential business value generated through enhanced stakeholder reporting and communication.

International Federation of Accountants (IFAC) observes that the recognition governments and many organizations have given to sustainability and sustainable developments are changing business culture and society. The global challenge is to ensure that organizations' sustainable development practices -
(a) reverse the previous erosion of natural resources, and
(b) improve their environmental, social, and economic performance.
This requires radical changes in the way we do business and the way we live our lives. Although many organizations aspire to being responsible, few could claim to be truly sustainable.

Meaning of Sustainability Reporting

There is no single, universally accepted definition of Sustainability Reporting.

Sustainability reporting is the practice of measuring, disclosing, and being accountable to internal and external stakeholders for organizational performance towards the goal of sustainable development.

'Sustainability reporting' is a broad term considered synonymous with others used to describe reporting on economic, environmental, and social impacts (e.g., triple bottom line, corporate responsibility reporting, etc.).

A sustainability report should provide a balanced and reasonable representation of the sustainability performance of a reporting organization – including both positive and negative contributions.

The Dimensions of Sustainability Reporting

A Sustainability Report discloses information on the company's activities across the economic, social and environmental dimensions

Sustainability has three important dimensions for all organizations: (a) economic viability, (b) social responsibility, and (c) environmental responsibility. Although trade-offs can occur between these dimensions, generally being socially responsible (towards employees, communities, and other stakeholders), and environmentally responsible, lead to enhanced trust, and therefore makes good business sense. Social and environmental responsibility cannot, however, stand in isolation from economic viability. Profitability and growth create jobs and wealth; organizations must therefore continue to provide products and services that people want. While pursuing a commercial imperative, organizations must also deal with social and environmental issues as part of ensuring that they generate added value for an organization and its stakeholders

GRI Sustainability Reporting Framework

The Global Reporting Initiative (GRI) is a network-based organization that has pioneered the development of the world's most widely used sustainability reporting framework. The reporting framework is developed through a consensus-seeking process with participants drawn globally from business, civil society, labor, and professional institutions.

GRI's Framework consists of the Sustainability Reporting Guidelines, Sector Supplements, National Annexes, and the Boundary and Technical Protocols.

The Sustainability Reporting Guidelines are the foundation of GRI's Framework and are now in their third generation. They feature sustainability disclosures that organizations can adopt flexibly and incrementally, enabling them to be transparent about their performance in key sustainability areas.

The G3.1 Sustainability Reporting Guidelines are the latest and most complete version. Launched in 2011, G3.1 completes the content of the G3 Guidelines released in 2006. G3.1 features expanded guidance on local community impacts, human rights and gender. While G3-based reports are still accepted, GRI recommends that reporters use G3.1, the most comprehensive reporting guidance available today.

The fourth generation of Guidelines – G4 – are currently in development and will be launched in May 2013.

Important Landmarks in Connection with Environment and Sustainable Development

1. The Brundtland Commission / World Commission on Environment and Development (WCED)

The Brundtland Commission, formally the World Commission on Environment and Development (WCED), known by the name of its Chair Gro Harlem Brundtland, was created by the United Nations in 1983 (General Assembly Resolution 38/161 established the Commission).

The commission was created to address growing concern "about the accelerating deterioration of the human environment and natural resources and the consequences of that deterioration for economic and social development."

In establishing the commission, the UN General Assembly recognized that environmental problems were global in nature and determined that it was in the common interest of all nations to establish policies for sustainable development

Report:

The Report of the Brundtland Commission, Our Common Future, was published by Oxford University Press in 1987.

When the Brundtland Commission published its report in 1987, it presented a new concept - sustainable development. The concept became one of the most successful approaches to be introduced in many years. In fact, it helped to shape the international agenda and the international community's attitude towards economic, social and environmental development.

The Report was welcomed by the General Assembly in its resolution 42/187.

The report deals with sustainable development and the change of politics needed for achieving that. The definition of this term in the report is quite well known and often cited:

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." It contains within it two key concepts:
• the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and

• the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

2. Agenda 21

Agenda 21 is a programme run by the United Nations (UN) related to sustainable development.

It is a comprehensive blueprint of action to be taken globally, nationally and locally by organizations of the UN, governments, and major groups in every area in which humans impact on the environment.

There are 40 chapters in the Agenda 21, divided into four main sections.

Development of Agenda 21

The full text of Agenda 21 was revealed at the United Nations Conference on Environment and Development (Earth Summit), held in Rio de Janeiro on June 14, 1992, where 178 governments voted to adopt the programme.

The number 21 refers to an agenda for the 21st century. It may also refer to the number on the UN's agenda at this particular summit.

Agenda 21, the Rio Declaration on Environment and Development, and the Statement of principles for the Sustainable Management of Forests were adopted by more than 178 Governments at the United Nations Conference on Environment and Development (UNCED) held in Rio de Janerio, Brazil, 3 to 14 June 1992.

Commission on Sustainable Development (Implementation of Agenda 21) – PERMANENT BODY

The Commission on Sustainable Development acts as a high level forum on

sustainable development and has acted as preparatory committee for summits and sessions on the implementation of Agenda 21.

The United Nations Division for Sustainable Development acts as the secretariat to the Commission and works 'within the context of' Agenda 21.

Implementation by member states remains essentially voluntary.

The Commission on Sustainable Development (CSD) was created in December 1992 to ensure effective follow-up of UNCED, to monitor and report on implementation of the agreements at the local, national, regional and international levels. It was agreed that a five year review of Earth Summit progress would be made in 1997 by the United Nations General Assembly meeting in special session.

The CSD meets annually in New York, in two-year cycles, with each cycle focusing on clusters of specific thematic and cross-sectoral issues, outlined in its new multi-year programme of work (2003-2017) (E/CN.17/2003/6)

As a functional commission of the UN Economic and Social Council (ECOSOC), CSD has 53 member States (about one third of the members are elected on a yearly basis). Each session of the CSD elects a Bureau, comprised of a Chair and four vice-Chairs.

Rio+5

In 1997, the General Assembly of the UN held a special session to appraise five years of progress on the implementation of Agenda 21 (Rio +5). The Assembly recognized progress as 'uneven' and identified key trends including increasing globalization, widening inequalities in income and a continued deterioration of the global environment. A new General Assembly Resolution (S-19/2) promised further action.

The Johannesburg Plan of Implementation

The full implementation of Agenda 21, the Programme for Further Implementation of Agenda 21 and the Commitments to the Rio principles, were strongly reaffirmed at the World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa from 26 August to 4 September 2002.

The Johannesburg Plan of Implementation, agreed at the World Summit on Sustainable Development (Earth Summit 2002) affirmed UN commitment to 'full implementation' of Agenda 21, alongside achievement of the Millennium Development Goals and other international agreements.

WSSD gathered a number of leaders from business and non-governmental organizations, 10 years after the first Earth Summit in Rio de Janeiro. (It was therefore also informally nicknamed "Rio+10".)

3. United Nations Conference on the Human Environment (UNCHE), Stockholm, Sweden

The United Nations Conference on the Human Environment (also known as the Stockholm Conference) was an international conference convened under United Nations auspices held in Stockholm, Sweden from June 5-16,1972.

It was the UN's first major conference on international environmental issues, and marked a turning point in the development of international environmental politics.

Attended by the representatives of 113 countries, 19 inter-governmental agencies, and more than 400 inter-governmental and non-governmental organizations, it is widely recognized as the beginning of modern political and public awareness of global environmental problems.

The meeting agreed upon a Declaration containing 26 principles concerning the environment and development; an Action Plan with 109 recommendations, and a Resolution.

One of the key issues addressed was the use of CFCs (haloalkanes), which seemed to be responsible for the depletion of the ozone layer. Global warming was mentioned, but in this matter nothing of substance was achieved at this Conference

4. UN Conference on Environment and Development (1992)

The United Nations Conference on Environment and Development, met at Rio de Janeiro from 3 to 14 June 1992, to Reaffirm the Declaration of the United Nations Conference on the Human Environment, adopted at Stockholm on 16 June 1972, and seek to build upon it,

Conference	United Nations Conference on Environment and Development (UNCED), Rio de Janeiro, 3-14 June 1992
Informal name	The Earth Summit
Host Government	Brazil
Number of Governments participating	172, 108 at level of heads of State or Government
Conference Secretary-General	Maurice F. Strong, Canada
Organizers	UNCED secretariat
Principal themes	Environment and sustainable development
NGO presence	Some 2,400 representatives of non-governmental organizations (NGOs); 17,000 people attended the parallel NGO Forum
Resulting document	Agenda 21, the Rio Declaration on Environment and Development, the Statement of Forest Principles, the United Nations Framework Convention on Climate Change and the United Nations Convention on Biological Diversity
Follow-up mechanisms	Follow-up mechanisms: Commission on Sustainable Development; Inter-agency Committee on Sustainable Development; High-level Advisory Board on Sustainable Development

Previous conference	UN Conference on the Human Environment, Stockholm (1972)

5. United Nations Environment Programme (UNEP)

UNEP was founded as a result of the United Nations Conference on the Human Environment (UNCHE) in June 1972 and has its headquarters in Nairobi, Kenya. UNEP also has six regional offices and various country offices.

UNEP is the designated authority of the United Nations in environmental issues at the global and regional level.

Its mandate is to coordinate the development of environmental policy consensus by keeping the global environment under review and bringing emerging issues to the attention of governments and the international community for action.

The UN Environment Programme (UNEP) coordinates United Nations environmental activities, assisting developing countries in implementing environmentally sound policies and encourages sustainable development through sound environmental practices.

6. UN global compact

Launched in July 2000, the UN Global Compact is a both a policy platform and a practical framework for companies that are committed to sustainability and responsible business practices. As a leadership initiative endorsed by chief executives, it seeks to align business operations and strategies everywhere with ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption.

The UN Global Compact is not a regulatory instrument, but rather a voluntary initiative that relies on public accountability, transparency and disclosure to complement regulation and to provide a space for innovation

The Ten Principles of the United Nations Global Compact

The UN Global Compact asks companies to embrace, support and enact, within their sphere of influence, a set of core values in the areas of human rights, labour standards, the environment, and anti-corruption:

Human rights
Principle 1. Businesses should support and respect the protection of internationally proclaimed human rights; and
Principle 2. make sure that they are not complicit in human rights abuses.

Labour
Principle 3. Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
Principle 4. the elimination of all forms of forced and compulsory labour;
Principle 5. the effective abolition of child labour; and
Principle 6. the elimination of discrimination in respect of employment and occupation.

Environment
Principle 7. Businesses are asked to support a precautionary approach to environmental challenges;
Principle 8. undertake initiatives to promote greater environmental responsibility; and
Principle 9. encourage the development and diffusion of environmentally friendly technologies.

Anti-corruption
Principle 10. Businesses should work against corruption in all its forms, including extortion and bribery.

7. Caux Round Table

The Caux Round Table (CRT) is an international network of experienced business leaders, who work with business and political leaders to design the intellectual strategies, management tools and practices to strengthen private enterprise and public governance to improve our global community. The Caux Round Table (CRT) works to promote a morally and sustainable way of doing business.

History

- The Caux Round Table was founded in 1986 by Frederick Phillips, former President of Philips Electronics and Olivier Giscard d'Estaing, former

Vice-Chairman of INSEAD, as a means of reducing escalating trade tensions.

- Later, the CRT began focusing attention on the importance of global corporate responsibility in reducing social and economic threats to world peace and stability.
- The CRT Principles for Business were formally launched in 1994, and presented at the United Nations World Summit on Social Development in 1995.
- The CRT Principles for Business articulate a comprehensive set of ethical norms for businesses operating internationally or across multiple cultures.
- The CRT Principles for Business emerged from a series of dialogues catalyzed by the Caux Round Table during the late 1980's and early 1990's. They are the product of collaboration between executives from Europe, Japan, and the United States, and were fashioned in part from a document called "The Minnesota Principles."
- The CRT Principles for Business have been published in twelve languages, reprinted in numerous textbooks and articles, and utilized in business school curricula worldwide. The Principles are recognized by many as the most comprehensive statement of responsible business practice ever formulated by business leaders for business leaders

What it is:

- The Caux Round Table (CRT) is an international network of principled business leaders working to promote a moral capitalism.
- The CRT advocates implementation of the CRT Principles for Business through which principled capitalism can flourish and sustainable and socially responsible prosperity can become the foundation for a fair, free and transparent global society.
- At the company level, the Caux Round Table advocates implementation of the CRT Principles for Business as the cornerstone of principled business leadership. The CRT Principles apply fundamental ethical norms to business decision-making.
- A specially designed process for incorporating the CRT Principles into the culture of a corporation is available for companies to use.
- Ethical training for corporate boards of directors and new ethics curriculum for business schools are being developed.

CRT Principles:

- Through an extensive and collaborative process in 1994, business leaders developed the CRT Principles for Business to embody the aspiration of principled business leadership.

- The CRT Principles for Business are a worldwide vision for ethical and responsible corporate behavior and serve as a foundation for action for business leaders worldwide. As a statement of aspirations, The CRT Principles aim to express a world standard against which business behavior can be measured.
- These principles are rooted in two basic ethical ideals: kyosei and human dignity. The Japanese concept of kyosei means living and working together for the common good enabling cooperation and mutual prosperity to coexist with healthy and fair competition. "Human dignity" refers to the sacredness or value of each person as an end, not simply as a mean to the fulfillment of others' purposes or even majority prescription.

USEFUL WEBSITES

United Nations Framework Convention on Climate Change
http://unfccc.int/2860.php

The World Bank
http://www.worldbank.org

Intergovernmental Panel on Climate Change
http://www.ipcc.ch/

United Nations Environment Programme
http://www.unep.org

Gateway to the UN System's Work on Climate Change
http://www.un.org/climatechange/index.shtml

Ministry of Environment and Forests
http://envfor.nic.in/cc/index.htm

Ministry of Power
http://www.powermin.nic.in/

Ministry of Non Conventional Energy Sources
http://mnes.nic.in/

Central Electricity Authority
http://www.cea.nic.in/

Bureau of Energy Efficiency
http://www.bee-india.nic.in/

Central Electricity Regulatory Commission
http://www.cercind.org/

CDM India – Designated National Authority
http://www.cdmindia.nic.in/

National CDM Authority, Ministry of Environment and Forests
http://cdmindia.in/

The Energy and Resources Institute
http://www.teriin.org/

Indian Energy Exchange
www.iexindia.com

Multi Commodity Exchange of India Ltd.
http://www.mcxindia.com

India Climate Portal
http://www.indiaclimateportal.org/

India Climate Missions
http://www.indiaclimatemissions.org/index.php

Indian Network for Climate Change Assessment
http://moef.nic.in/modules/others/?f=event

National Green Tribunal
http://www.greentribunal.in/

Central Pollution Control Board
http://www.cpcb.nic.in

State Pollution Control Boards

1. Andhra Pradesh - http://www.appcb.org
2. Assam - http://www.pcbassam.org
3. Chattisgarh - http://www.enviscecb.org

4. Goa - http://www.goaspcb.gov.in
5. Gujarat - http://www.gpcb.gov.in/
6. Haryana - http://hspcb.gov.in
7. Himachal Pradesh - http://hppcb.nic.in
8. Karnataka - http://kspcb.kar.nic.in/
9. Kerala - http://www.keralapcb.org/
10. Maharashtra - http://mpcb.mah.nic.in
11. Manipur - http://npcbngl.nic.in/ABOUT_US.HTM
12. Madhya Pradesh - http://www.mppcb.nic.in
13. Meghalaya - http://megspcb.gov.in
14. Orissa - http://www.ospcboard.org
15. Punjab - http://www.ppcb.gov.in
16. Rajasthan - http://rpcb.nic.in
17. Tamil Nadu - http://www.tnpcb.gov.in
18. Tripura - http://www.tripura.nic.in
19. Uttar Pradesh - http://www.uppcb.com
20. Uttaranchal - http://gov.ua.nic.in/ueppcb/
21. West Bengal - http://www.wbpcb.gov.in
