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Clean Development Mechanism in Synergy with ISO 14001: Some Findings

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***Abstract*-- The Clean Development Mechanism (CDM) was designed with two objectives: To contribute to local sustainable development in the host country and to assists Annex-I countries to achieve their emission reduction targets in a cost-efficient manner (UNFCCC 1997). The CDM inherited its twin objective from the two main instruments that were merged into the CDM. The sustainable development objective originates from the proposed Clean Development Fund (CDF), whereas the objective of cost-efficient emission reductions was the main driver behind the concept of Joint Implementation (JI). As a consequence of the amalgam, the CDM was given a twin objective. Different features of the ISO are discussed that are in synergy with the CDM.**

Key words - Clean development mechanism, ISO 14001, Synergy, Sustainable development, Energy

I. INTRODUCTION

The Clean Development Mechanism (CDM) was an initiative in the negotiation of the Kyoto Protocol. Through the Protocol governments accepted legally binding constraints on their greenhouse gas emissions, global efforts to protect the environment and achieve sustainable development. The Protocol also launched new ground with its innovative "cooperative mechanisms" aimed at cutting the cost of curbing emissions. The Protocol therefore includes three market-based mechanisms aimed at achieving cost-effective reductions, i.e., International Emissions Trading (IET), Joint Implementation (JI) and the CDM. The Clean Development Mechanism (CDM) is a mechanism defined by the Kyoto Protocol, whereby projects with a component that includes the reduction of Green House Gas (GHG) emissions are implemented. The CDM is the only mechanism in the Kyoto Protocol that involves non-Annex 1 countries, by enabling them to host emission reduction project on their territory.

The critical factor for the successful operation of CDM transaction is an active international market for certified emission reduction units (CERs) as a result of intervention to reduce GHG emissions. An international market has to facilitate partnership between several bodies, namely project developers, investors, independent auditors, national authorities in host and recipient countries and the international agencies that are responsible for implementing the Kyoto Protocol. For a successful international market framework for CDM transaction a number of fundamental principles were identified. Different items of agreed framework were such which would ensure sustainable development and meet national objectives for the host country and not just emission reduction (ER) through CERs for the recipient country.

The CDM, as per Article 12 of the Kyoto Protocol, allows governments or private entities in industrialized countries to implement emission reduction projects in developing countries and receive credit in the form of "certified emission reductions," or CERs, which they may count against their national reduction targets. The CDM must promote sustainable development in developing countries, while allowing developed countries to contribute to the goal of reducing atmospheric concentrations of greenhouse gases. Main characteristics of CDM are:

1. CDM is a market mechanism in which the price of a certified emission reduction (CER) measured in a tone of CO_2 emission, is negotiated between buyers and sellers.

2. Annex 1 countries with emission reduction targets or authorized public or private entities within these are allowed to invest in projects that reduce GHG emission and contribute to Sustainable Development (SD) in non - Annex1 countries.
3. Participation in the CDM is voluntary but to have projects registered with governing body of the CDM, all parties involved are required to obtain a letter of approval from their Designated National Authorities (DNA) to document this.
4. In non – Annex 1 countries, the DNA must approve that each CDM project contributes to SD as defined nationally.

Methodologically it is the responsibility of the project developer to document in a Project Design Document (PDD) that the emission reduction are real, measurable and long term.

CDM and Sustainable Development

The CDM lowers the cost of compliance with the Protocol for developed countries, developing countries will benefit as well, not just from the increased investment flows, but also from the requirement that these investments advance sustainable development goals. The CDM encourages developing countries to participate by promising that development priorities and initiatives will be addressed as part of the package. This recognizes that only through long-term development will all countries be able to play a role in protecting the climate.

From the developing country perspective, the CDM can attract capital for projects that assist in the shift to a more prosperous but less carbon-intensive economy; encourage and permit the active participation of both private and public sectors; provide a tool of technology transfer, if investment is channeled into projects that replace old and inefficient fossil fuel technology, or create new industries in environmentally sustainable technologies; and help define investment priorities in projects that meet sustainable development goals. Specifically, the CDM can contribute to a developing country's sustainable development objectives through:

(a) Transfer of technology and financial resources;
(b) Sustainable ways of energy production;
(c) Increasing energy efficiency & conservation;
(d) Poverty alleviation through income and employment generation; and
(e) Local environmental side benefits

In comparing potential CDM projects with what might otherwise take place, it is clear that the majority will entail not only carbon reduction benefits, but also produce a range of environmental and social benefits within developing countries. Sustainable development benefits could include reductions in air and water pollution through reduced fossil fuel use, especially coal, but also extend to improved water availability, reduced soil erosion and protected biodiversity. For social benefits, many projects would create employment opportunities in target regions or income groups and promote local energy self-sufficiency. Therefore, carbon abatement and sustainable development goals can be simultaneously pursued. Many options under the CDM could create significant co-benefits in developing countries, addressing local and regional environmental issues.

Sustainable development encompasses at least three dimensions: the social, the economic and the environmental dimensions. Examples of general SD criteria for each of the dimensions are:

1. Social criteria: poverty elevation, equity and improved quality of life.
2. Economic criteria: financial return to local entities, a positive balance of payments and technology transfer.
3. Environmental criteria: reduction of GHG and use of fossil fuels, conservation of local resources, improved health and reduced pressure on local environment.

When it comes to practical and concrete assessments of sustainability impact of CDM project there is no single, authoritative and universally accepted approach or methodology applicable to any CDM project regardless of project type and location. As DNAs are delegated the authority to confirm whether a CDM project assists in achieving SD or not, actual definition vary according to what different host countries consider as their development priorities.

Operational Elements of a CER Market Frame Work - CDM

In addition to the international and national regulatory framework outlined above, a number of operational elements should emerge to support the development of a CER market. These include:

- One or more institutions/specialist/consultants that provide technical inputs for the identification, formulation and development of CDM projects and project baselines.
- One or more institutions/banks/development agencies that provide or secure financial resources for developing and financing CDM projects.
- Approved agents/agencies (*operational entities*) that are capable of providing validation, verification and certification services for CDM projects.
- Markets and information sites where potential sellers and buyers can obtain the price and other relevant information relating to the supply of and demand for CERs.
- Brokers that bring potential buyers and sellers together to assist in the buying and selling of CERs and the recording of binding transactions.

Many of these elements have evolved in anticipation of CDM and market for CERs. Some of these elements are active in Activities Implemented Jointly (AIJ) transactions while others have operated in other related emissions trading markets. The rules governing the operation of these elements

will derive from the rules established by the CDM EB, the National CDM authorities and the Annex 1 Supervisory Committee etc.

Legal Environment - CDM

A necessary but not sufficient pre-condition for attracting investments in CDM projects is a legal environment that fosters general investment. Certainly, an environment in which rules and regulations are not in place to protect and foster investments is discouraging for CDM initiatives. Additionally, environments in which internal and/or external investors have little or no legal recourse will also inhibit CDM project investments. Thus, favorable legal and regulatory investment environments should attract CDM initiatives and vice versa.

For the market in CDM projects to flourish, the rules of the CDM should be clear, transparent and workable. This is a key role for the CDM EB and/or National CDM boards. Then key players, recognizing the potential value of this market, will independently invest and undertake the front-end work of project identification and formulation needed to successfully develop CDM projects. By fostering the involvement of independent players, the CDM can avoid the need for expending public funds for project development, while relying on the marketplace to mobilize and apply funds to develop projects for the CDM.

Things included in the preparation of the CDM projects

The preparation cycle of a CDM project is compromised of the following steps:

(a) Project identification;
(b) Preliminary assessment of the project`s eligibility and its capacity for self – financing;
(c) Where necessary negotiation for the sharing of credits between the different partners involved in the projects;
(d) Where necessary contact with potential buyers to measure the level of interest raised by the CERs to be generated by the project;
(e) Preparation of the project design document (PDD) including, in particular, study of the baseline and requirement of the monitoring plan;
(f) Request for the host country formal approval;
(g) Validation of the project by the Operational Entity;
(h) Presentation of the project for registration with the CDM executive board;
(i) Possible drafting of the Emission Reduction Purchase Agreements.

Certain steps of the preparation cycle, such as the formulation of the business plan and the search for financing, may be implemented during the conventional project development phase.

Project Eligibility Criteria

Article 12 of the Kyoto Protocol stipulates four principal eligibility criteria for CDM projects; these have been elaborated at Marrakesh. They are:

(a) Non-annex 1 Parties "will benefit from project activities resulting CERs".
(b) Projects must assist non-annex 1 Parties "in achieving *sustainable development and* contributing to the ultimate objective of the Convention".
(c) Projects must result in "real, measurable and long-term benefits related to the mitigation of climate change".
(d) Projects must result in "reductions in emissions that are additional to any that would occur in the absence of the certified project activity".

Validation of CDM Projects

Figure 3 illustrates the key actors/stakeholders and relevant issues that are associated with the validation of a CDM project. Projects that are proposed for the CDM have to be certified or validated as eligible projects before they are able to secure all their financing (financial closure).

This process is necessary in order to capitalize on the financial value of the project's ERs. Validation as a CDM project activity is tantamount to receiving a license to produce and sell ERs. Without the CDM validation, a project developer would not be able to negotiate an ER purchase agreement (ERPA) with potential buyers. This is similar to a power production license, which must precede the negotiation of a power purchase agreement (PPA).

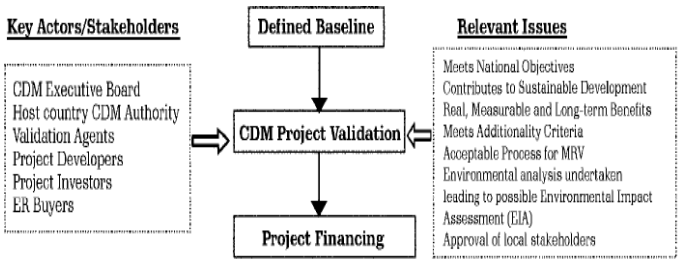

Fig 1 Validation of CDM project

The PDD must provide the documentary evidence to demonstrate that the proposed project meets the validation criteria as specified in the Marrakesh Accord rules.

A critical element of the CDM validation process is the assessment of the assumed baseline and the estimated production of ERs by the proposed project. The process must validate the estimated ER production of the proposed CDM project against the assumed baseline conditions. The validation, once issued, would serve as a license to produce and sell ERs that can be fully certified. The validity period for the baseline defines the period for which the ERs from a CDM project are considered to be additional. Thus, the period of validation for a CDM project will be tied to the validity period for the associated baseline.

Sustainability impact studies - CDM

How to assess the sustainability impact of CDM projects using criteria and indicators is the common question of studies. Differences between the methodologies arise when it comes to the selection of specific criteria and indicators for measurement, which tend to vary with the type of project assessed and whether the assessment of impacts applies at project/local level, or regional or national level. Scientists have developed approaches which are especially oriented towards energy sector CDM projects, applicable respectively at project level and to a portfolio of projects. Some people have put focus on small-scale CDM projects using examples of different types of energy projects in Tanzania, Kenya and Ghana, whereas others aim to improve existing SD assessment tools with his contribution, 'The Multi-Attribute Utility Theory for CDM Project Assessment.' The main differences exist in the way indicators are constructed and weighted against each other for evaluating the different aspects of SD using qualitative or quantitative methods or a mix of the two. Olhoff et al. (2004) and Sutter (2003) both review the advantages and disadvantages of the different approaches available to evaluate the sustainability of CDM projects. Among eight partly overlapping categories of approaches, the most commonly referred to and used are checklists and multi-criteria assessments or a combination of the two. One example is the South South North (SSN) Matrix tool (South South North 2004), a combination of the checklist and multi-criteria approaches. It is based on a scoring system, where qualitative Climatic Change (2007) 84:59–73 63 values are assigned to each criterion based on selected quantifiable indicators. The scores can be added and generate a total score for each CDM project assuming equal weights to all indicators.

Due to very high global warming potential of HFC-23, the average CER generation from a HFC-23 project is over 50 times higher than an average renewable energy project. Overall, a similar trend is discernible in the international CDM market; the bulk of CERs (46.5%) from the projects in various non-Annex B countries together, will also be generated from projects on destruction/reduction of HFC-23 and N_2O (Fenhann 2006).

Does CDM really contribute to SD?

The Clean Development Mechanism (CDM) was designed with two objectives: To contribute to local sustainable development in the host country and to assists Annex-I countries to achieve their emission reduction targets in a cost-efficient manner (UNFCCC 1997). The CDM inherited its twin objective from the two main instruments that were merged into the CDM. The sustainable development objective originates from the proposed Clean Development Fund (CDF), whereas the objective of cost-efficient emission reductions was the main driver behind the concept of Joint Implementation (JI). As a consequence of the amalgam, the CDM was given a twin objective. Hence, the question rose: Is it possible to fulfill both these objectives through one single mechanism? Many critics claim that the CDM is failing to meet its sustainable development goal and give a variety of reasons.

Moreover, the CDM only rewards a project's climate benefit but not other positive environmental or social benefits it may deliver. Indeed, there is a strong focus on projects which generate a large amount of CERs by reducing gases with extremely high global warming potential. These have low abatement costs but produce few, if any, sustainable development benefits. When examining the 1145 projects that was either already registered or undergoing validations as of 14 September 2006, renewable energy projects clearly dominate in terms of numbers: 665 were in the renewable energy category (including large hydro projects). The picture changes, however, when looking at the number of CERs per project type as measure of how much 'carbon financing' flows into the respective project type. From this perspective, the market is clearly dominated by hydrofluorocarbons (HFC), N2O and methane, which in aggregate account for three quarters of the expected annual CERs. As a matter of fact, the 22 HFC and N2O projects combined account for 44% of expected annual CERs, whereas the 665 renewable energy projects in total account for only 22% (Fanhann, 2006).

Clearly, a project's local impact on sustainable development does not depend on the number of CERs it generates. Six hundred sixty-five renewable energy projects is a sizable number and these projects may be yielding substantial benefits for the local population. However, there may be a danger that projects with large sustainable development benefits but higher abatement costs may be crowded out of the market if the price for CERs is driven down by high-yielding projects that attract much of the investment. As a matter of fact, the potential for projects dealing with the highly potent GHGs seems far from exhausted. For example, the total potential for HFC projects is estimated to be more than 100 Mt CO_2 equivalents per year, with abatement costs of about 0.50 USD per tonne CO_2 equivalent.

The current form of the CDM is also being criticized for being ill-suited for renewable energy and energy efficiency projects because activities in these areas are allegedly often of a dispersed nature, have relatively high transaction costs and yield relatively low CER volumes. Moreover, even if projects with clear sustainable development benefits are feasible, as the 665 renewable energy projects seem to demonstrate, with the hitherto prevailing single-site approach they nevertheless remain only isolated local efforts with limited transformational effect. As a consequence, some critics claim that the CDM in its current design as a market-based mechanism, which primarily focuses on generating CERs within isolated local projects, is fundamentally incapable of making a substantial contribution to sustainable development.

ISO 14001

An Environmental Management System (EMS) is a framework that allows your organization to consistently control its significant impacts on the environment, reduce the

risk of potentially costly pollution incidents, ensure compliance with environmental legislation and continually improve your business operations. Establishment of standardized EMS is one of the most effective ways to support continual development of preventative efforts in organization's environmental practice. Several models for EMS have been developed recently and ISO 14001 is the last and the most popular standard in this series. However, EMS standard provides no guarantee that pollution prevention approach will be applied, thus efficiency of EMS will be reduced.

EMS standards usually focus on the quality of management procedure, but do not define level of environmental performance. The spirit of ISO 14001 In the simplest of terms, and condensing the whole concept of ISO 14001 into one sentence, we can say that fundamentally the Standard requires an organization to: "Control and reduce its impact on the environment" In simple terms, the Standard requires an organization to state how it goes about controlling and reducing its impact on the environment: doing in practice what it has stated in its environmental policy; recording what has occurred; and learning from experience.

What obligation does this impose upon an organization? ISO 14001 requires an organization to control its impacts on the environment. All aspects of business activity cause changes in the environment to a greater or lesser extent. Organizations deplete energy sources and raw materials and generate products and waste materials. These changes are referred to as environmental impacts. ISO 14001 defines an environmental impact as: "Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's activities, products or services"

Identifying and assessing the significance of environmental impacts is a critical stage in an organization's preparatory stages for ISO 14001. Thus the organization needs to understand that by operating its processes, by manufacturing its products or supplying its services, it is depleting natural resources and using non-renewable energy sources. At the same time it is also producing by-products in the form of waste materials.

During the period of planning the implementation, some organizations have wondered how the ISO 14001 system will operate at the point in time when all the environmental objectives of the organization have been fulfilled and where, perhaps, further improvements would be subject to the law of diminishing returns. What does the organization do next? Will ISO 14001 certification be lost? Does the organization attempt to improve in environmentally trivial areas, performing a meaningless paperwork exercise merely to generate evidence that the system is still alive, in order to retain certification? The reality is that once the initial significant environmental impacts have been controlled and minimized, the other hitherto less significant impacts become more significant and a new cycle of improvement begins. Thus the cycle is never-ending and there is continuous improvement of the organization's environmental performance. New knowledge comes to light and new, tougher legislation will always be around the corner. Therefore, this status of 'zero or trivial significant environmental impacts' will never occur.

It is also tempting of environmental management to compare two similar organizations manufacturing the same products. Although they manufacture the same products, one of them is noted for having a higher impact upon the environment than the other like producing more waste to landfill, using more energy due to older plant, has more breaches of legislation, is visually offensive due to old, badly sited buildings and has more smell and noise nuisance.

An EMS does not seek to be comparable; it proves only that each organization is seen to be committed to taking appropriate and practical steps to reduce their environmental impacts (within their individual capability and level of technology). Providing that both organizations can demonstrate such commitment, the certification body will allow certification. This is the concept of the EMS: it is an improvement process, rather than a method for stating that, at any one point in time, one organization is performing better than another.

Background – ISO 14001

The ISO (International Organization for Standardization) is a worldwide federation founded in 1947 to promote the development of international manufacturing, trade and communication standards. The 1990s saw the development of environmental management systems (EMSs) designed to provide a framework for organizations that were trying to incorporate environmental objectives into their decision making (Boiral and Sala 1998, Green and La Fontaine 1996, Miller 1998, Porter and van der Linde 1995, Powers 1996). ISO 14001 is a standard for EMSs that has attracted global attention since its introduction in 1996. However, for the most part, decision makers in environmental management lack practical guidelines on the most effective ways of implementing the ISO 14001 standard (Cantin, pers. comm., 1997; Kirkland and Thompson 1997). If the gap between EMS theory and practice can be bridged, and ISO 14001 becomes widely implemented, the standard could have a substantial impact on reducing the rate of environmental damage.

ISO 14001 is a voluntary standard that can be considered the carrot to go along with the stick of "command and control" environmental regulation (Cascio in Lewis1997, 75). One requirement of the EMS standard is for the training of employees in areas related to environmental awareness and technical, environmental competence. Educating employees about environmental issues is one of the most promising contributions that ISO 14001 can make to the future of environmentally sustainable management practices. A key advisor in the development of the standard felt that "[command and control's] ultimate failure is that employees don't think of the environment as their responsibility" (Cascio in Lewis 1997, 75). Training and awareness programs are key strategies in the implementation of an integrated EMS and, hence, in improving corporate environmental performance

(Ecotec 1992, IW 1998, Kirkland and Thompson 1997, Lawrence and Morell 1995).

ISO 14001 is an internationally accepted standard that defines the requirements for establishing, implementing and operating an Environmental Management System. The standard recognizes that you may be concerned about both your own profitability and managing environmental impacts. ISO 14001 integrates these two motives and provides a refreshingly workable methodology to achieve an effective Environmental Management System. It's not just a 'paper' standard – it demands the commitment of whole organization. If the environment benefits and profits are enhanced, stakeholders see rewards.

An Environmental Management System (EMS) assists organizations in identifying the environmental interests of its stakeholders such as customers, shareholders, employees, local residents, regulators, local authority etc. ISO 14001 provides an organization with a structured approach to planning, implementing and managing an EMS. Operating an effective EMS can:

(a) Provide cost savings through the reduction of waste and more efficient use of natural resources (electricity, water, gas and fuels).
(b) Tighten production processes, yielding better efficiency and reduction in the risk of incidents.
(c) Improve internal communications and morale - often leading to sound environmental solutions suggested by staff, who are the ultimate owners of the business processes.
(d) Ensure that the organization is better placed to avoid future fines and penalties from not meeting environmental legislation.
(e) Reduce insurance costs through demonstrating better risk management.
(f) Lead to a better public perception of the organization and the potential to gain a competitive advantage, leading to improved sales opportunities.
(g) Lead to better community awareness of the impact of your activities on local residents (noise, smell, dust, vibration, etc.).

Requirements of CDM and ISO 14001

Requirements of CDM

National CDM Authority

The Ministry of Environment and Forests (MoEF) is the nodal ministry dealing with climate change and CDM issues in India. It established the Designated National Authority (DNA) in December 2003 as the National CDM Authority (NCDMA). The NCDMA is chaired by the Secretary of MoEF. The other members are the Secretary, Ministry of External Affairs, the Secretary, Ministry of Finance, the Secretary, Department of Industrial Policy and Promotion, the Secretary, Ministry of Nonconventional Energy Sources, the Secretary, Ministry of Power, the Secretary, Planning Commission and the Joint Secretary of Climate Change, MoEF. The Member-Secretary of the NCDMA is the Climate Change Director of MoEF. Fig. 1 Approval

Process for a CDM Projects

The above flow diagram depicts the approval process for a CDM project. The project developers first submit the Project Concept Note (PCN) and the Project Design Document (PDD). These documents are circulated for review by the NCDMA members, who then call the project developers for a presentation at a regularly scheduled once-amonth meeting. Any clarifications/additional information from the project developers aresought when required by the NCDMA members. If all the requirements are met, India gives host country, the approval. The entire process for host country approval takes 60 days. No fees are charged by the National CDM Authority. The project developers then present their documents to the CDM Executive Board for approval and registration.

Sustainable Development Indicators

It is the prerogative of the host party to confirm whether a clean development mechanism project facilitates sustainable development in its country. Also, a CDM should be oriented towards improving the quality of life of the very poor from an environmental standpoint. The following aspects should be considered when designing CDM project activity:

1. Social well-being; The CDM project activity should improve the quality of life of people through poverty alleviation, job creation, social disparity removal and the provision of basic amenities.
2. Economic well-being; The CDM project activity should attract additional investment consistent with the needs of the people.
3. Environmental well-being; The project should include a discussion of its impact on resource sustainability, resource degradation, biodiversity friendliness, impact on human health and reduction of pollution levels in general.
4. Technological well-being; The CDM project activity should lead to transfer of environmentally sound technologies, with priority given to renewable and energy efficiency projects consistent with best practices in order to assist in upgrading the technological base.

Baselines

The project proposal must clearly and transparently describe the methodology used to determine baselines. Methodologies should:

(a) Create baselines that are precise, transparent, comparable and workable;
(b) Avoid overestimation;
(c) Be homogeneous and reliable;
(d) Indicate potential errors;

(e) Establish system boundaries of baselines;
(f) Describe clearly intervals between baseline updates of baselines;
(g) Highlight the role of externalities (social, economic and environmental);
(h) Include historical emission data sets wherever available; and
(i) Mention the lifetime of the project cycle clearly.

Baselines should be created on a project-by-project basis except for those categories that qualify for simplified procedures. The project proposal should indicate the formulae used for calculating GHG offsets in the project and baseline scenario. Leakage, if any, should be described. For the purpose of project concept notes (PCN), default values may be used with justification. Determination of the base project, which would have come up in the absence of the proposed project, should be clearly described in the project proposal.

Financial Indicators

The project participants should highlight the following financial aspects:

(a) Flow of additional investment;
(b) Cost-effectiveness of energy saving;
(c) Internal rate of return (IRR) without accounting for CERs; IRR with CERs;
(d) Liquidity, NPV, cost/benefit analysis, cash flow, and so forth, establishing that there is a strong probability that the project will eventually be implemented;
(e) Agreements reached with the stakeholders, if any, including power purchase agreements, memorandum of understanding, and so forth;
(f) Inclusion of indicative costs related to validation, approval, registration, monitoring and verification, certification and share of proceeds; and
(g) Available funds, financing agency, and a description of how it is sought to achieve financial closure.

Technological Feasibility

The proposal should include the following technical elements:

- The proposed technology/process;
- Product/technology/material supply chain;
- Technical complexities, if any;
- Preliminary designs and schematics for all major equipment needed, design requirements, manufacturer's name and details, and capital cost estimates;
- Technological reliability;
- Organizational and management plan for implementation, including timetable, personnel requirements, staff training, project engineering and CPM/PERTChart.

Risk analysis

The project proposal should clearly state risks associated with a project, including apportionment of risks and liabilities as well as insurance and guarantees, if any.

Requirements of ISO 14001

Clause 4.1: General Requirements

The organization shall establish, document, implement, maintain and continually improve an environmental management system in accordance with the requirements of this international system and determine how it will fulfill these requirements. The organization shall define and document the scope of its environmental management system.

Clause 4.2: Environmental Policy

Top management shall define the organization`s environmental policy and ensure that, within the defined scope of its environmental management system, it

a) Is appropriate to the nature, scale and environmental impacts of its activities, product and services,
b) Include a commitment to continual improvement and prevention of pollution,
c) Includes a commitment to comply with applicable legal requirements and with other requirements to which the organization subscribe which relate to its environmental aspects,
d) Provide the framework for setting and reviewing environmental objectives and targets,
e) Is documented, implemented and maintained,
f) Is communicated to all persons working for on behalf of the organization, and
g) Is available to the public.

Clause 4.3: Planning

Environmental Aspects

The organization shall, implement and maintain a procedure (s)

a) To identify the environmental aspects of its activities, products and services within the defined scope of the environmental management system that it can control and those it can influence taking into account planned or new developments, or new or modified activities, products and services, and
b) To determine those aspects that has or can have significant impact (s) on the environment (i.e. significant environmental aspects).

The organization shall have document this information and keep it up to date. The organization shall ensure that significant environmental aspects are taken into account in

establishing, implementing and maintaining its environmental management system.

Legal and Other Requirements

The organization shall establish, implement and maintain a procedure (s)

a) To identify and have access to the applicable legal requirements and other requirements to which the organization subscribes related to its environmental aspects, and
b) To determine how these requirements apply to its environmental aspects.

The organization shall ensure that these applicable legal requirements and other requirements to which the organization subscribes are taken into account in establishing, implementing and maintaining the environmental management system.

Objectives, Targets and Programme(s)

The organization shall establish, implemented and maintain documented environmental objectives and targets, at relevant functions and level within the organization. The objectives and targets shall be measurable, where practicable and consistent with the environmental policy, including the commitments to prevention of pollution, to compliance with applicable legal requirements and other requirements to which the organization subscribes, and to continual improvement.

When establishing and reviewing its objectives and targets, an organization shall take into account the legal requirement and other requirements to which the organization subscribe, and its significant environmental aspects. It shall also consider its technological options, its financial, operational and business requirements, and the view of interested parties.

The organization shall establish, implement and maintain a programme(s) for achieving its objectives and targets, programme(s) shall include

a) Designation of responsibility for achieving objectives and targets at relevant functions and level of the organization.
b) The means and time-frame by which they are to be achieved.

Clause 4.4: Implementation and Operation

Resources, Roles, Responsibility and Authority

Management shall ensure the availability of resources essential to establish, implement, maintain and improve the environmental management system. Resources include human resources and specialized skills, organizational infrastructure, technology and financial resources. Roles, responsibility and authorities shall be defined, documented and communicated in order to facilitate effective environmental management. The organization`s top management shall appoint a specific management representative(s) who, irrespective of other responsibilities, shall have defined roles, responsibilities and authority for

a) Ensuring that an environmental management system is established, implemented and maintained in accordance with the requirements of this international standard,
b) Reporting to top management on the performance of the environmental management system for review, including recommendations for improvement.

Competence, Training and Awareness

The organization shall ensure that any person(s) performing task for it or on its behalf that have the potential to cause a significant environmental impact(s) identified by the organization is (are) competent on the basis of appropriate education, training or experience and shall retain associated records.

The organization shall identify training need associated with its environmental aspects and its environmental management system. It shall provide training or take other action to meet these needs, and shall retain associated records.

a) The organization shall establish, implement and maintain a procedure(s) to make persons working for it or on its behalf aware of a) The importance of conformity with the environmental policy and procedure and with the requirements of the environmental management system,
b) The significant environmental aspects and related actual or potential impacts associated with their work, and the environmental benefits of improved personal performance,
c) Their roles and responsibility in achieving conformity with requirement of the environmental management system, and
d) The potential consequences of departure from specified procedure.

Communication

With regards to its environmental aspects and environmental management system, the organization shall establish, implement and maintain a procedure(s) for

a) Internal communication among the various level and function of the organization,
b) Receiving, documenting and responding to relevant communication from external interested parties.

The organization shall decide whether to communicate externally about its significant environmental aspects, and shall document its decision. If the decision is to communicate, the organization shall establish and implement a method(s) for this external communication.

Control of Documents

Document required by the environmental management system and by this international standard shall be controlled. Records are a special type of document and shall be controlled in accordance with the requirements.

The organization shall establish, implement and maintain a procedure(s) to

a) Approve documents for adequacy prior to issue,
b) Review and update as necessary and re-approve documents,
c) Ensure that changes and the current revision status of documents are identified,
d) Ensure the relevant version of applicable documents are available at point of use,
e) Ensure that documents remain legible and readily identifiable,
f) Ensure that documents of external origin determined by the organization to be necessary for the planning and operation of the environmental management system are identified and their distribution controlled, and
g) Prevent the unintended use of obsolete documents and apply suitable identification to them if they are retained for any purpose.

Operational Control

The organization shall identified and plan those operations that are associated with the identified significant environmental aspects consistent with its environmental policy, objectives and targets, in order to ensure that they are carried out under specified conditions, by

a) Establishing, implementing and maintaining a documented procedure(s) to control situations where their absence could lead to deviation from the environmental policy, objectives and targets, and
b) Stipulating the operating criteria in the procedure(s), and
c) Establishing, implementing and maintaining procedures related to the identified significant environmental aspects of goods and services used by the organization and communicating applicable procedures and requirements to suppliers, including contractors.

Emergency Preparedness and Response

The organization shall establish, implement and maintain a procedure(s) to identify potential emergency situations and potential accidents that can have an impact(s) on the environment and how it will respond to them.

The organization shall respond to actual emergency situations and accidents and prevent or mitigate associated adverse environmental impacts. The organization shall periodically review and, where necessary, revise its emergency preparedness and response procedures, in particular, after the occurrence of accidents or emergency situation.

The organization shall also periodically test such procedures where practicable.

Clause 4.5: Checking

Monitoring and Measurement

The organization shall establish. Implement and maintain a procedure(s) to monitor and measure, on a regular basis, the key characteristics of its operations that can have a significant environmental impact. The procedure shall include the documenting of information to monitor performance, applicable operational controls and conformity with the organization`s environmental objectives and targets. The organization shall ensure that calibrated or verified monitoring and measurement equipment is used and maintained and shall retain associated records.

Nonconformity, Corrective Action and Preventive Action

The organization shall establish, implement and maintain a procedure(s) for dealing with actual and potential nonconformity(ies) and for taking corrective action and preventive action. The procedure(s) shall define requirements for

a) Identifying and correcting nonconformity(ies) and taking action(s) to mitigate their environmental impacts,
b) Investigating nonconformity(ies), determining their cause(s) and taking actions in order to avoid their recurrence,
c) Evaluating the need for action(s) to prevent nonconformity(ies) and implementing appropriate actions designed to avoid their occurrence,
d) Recording the result of corrective action(s) and preventive action(s) taken, and
e) Reviewing the effectiveness of corrective action(s) and preventive action(s) taken,

Action taken shall be appropriate to the magnitude of the problem and the environmental impacts encountered. The organization shall ensure that any necessary changes are made to environmental management system documentation.

Control of Records

The organization shall establish and maintain records to demonstrate conformity to the requirements of its environmental management system and of this international standard, and the result achieved.

The organization shall establish, implement and maintain a procedure(s) for the identification, storage, protection, retrieval, retention and disposal of records. Record shall be and remain legible, identifiable and traceable.

Internal Audit

The organization shall ensure that internal audits of the environmental management system are conducted at planned intervals to

a. Determine whether the environmental management system
   1) Conforms to planned arrangements for environmental management including the requirements of this international standard, and
   2) Has been properly implemented and is maintained, and
b Provide information on the results of audits to management system.

Audit programmes shall be planned, established, implemented and maintained by the organization, taking into consideration the environmental importance of the operation(s) concerned and the results of previous audits.

Audit procedure(s) shall be established, implemented and maintained that address. The responsibilities and requirements for panning and conducting audits, reporting results and retaining associated records. The determination of audit criteria, scope, frequency and methods.

Selection of auditors and conduct of audits shall ensure objectivity and the impartiality of the audit process.

Clause 4.6: Management Review

Top management shall review the organization`s environmental management system, at planned intervals, to ensure its continuing suitability, adequacy and effectiveness. Reviews shall include assessing opportunities for improvement and the need of changes to the environmental management system, including the environmental policy and environmental objectives and targets. Records of the management reviews shall be retained. Input to management reviews shall include

a) Result of internal audits and evaluation of compliances with legal requirements and with other requirements to which the organization subscribes,
b) Communication(s) from external interested parties, including complaints,
c) The environmental performance of the organization ,
d) The extent to which objectives and targets have been met,
e) Status of corrective and preventive actions,
f) Follow-up action from previous management reviews,
g) Changing circumstances, including developments in legal and other requirements related to its environmental aspects, and
h) Recommendation for improvement.

The output from management reviews shall I include any decisions and actions related to possible changes to environmental policy, objectives, targets and other elements of the environmental management system, consistent with the commitment to continual improvement.

II. LITERATURE REVIEW

CDM

The CDM has its history in the larger debates on linkages between 'climate change' and 'SD,' two concepts which emerged in research and policy in the late 1980s. Historically, the concepts have remained largely divided for a long period of time. While the climate change debate has been natural science-driven, the SD debate has been framed in a more social and human science oriented approach. The historical divide is well analyzed and described in the literature (Cohen et al. 1998; Michaelis 2003; Najam et al. 2003; Swart et al. 2003). The divide continued until around 2001–2002, when the International Panel on Climate Change (IPCC) in the Third Assessment Report and delegates at the World Summit on Sustainable Development created platforms to direct the focus towards integration and linkages between climate change and SD. Since then an emerging and growing literature has dealt with the following issues identifying synergies and trade-offs between climate change and SD:

(1) Views from the South (Davidson et al. 2003; Najam et al. 2003; Sokona et al. 2002),
(2) Equity (Ghersi et al. 2003; Metz et al. 2002),
(3) Adaptation and Poverty (Bloom 2004; Burton and May 2004; Devereux and Edwards 2004; Huq and Reid 2004) and
(4) The CDM's contribution to SD.

When the institutional set-up governing the CDM was discussed and decided upon, developing countries argued that an international standard for SD would impinge on their sovereignty (Figueres 2005). Hence, the responsibility for achieving SD was delegated to Designated National Authorities (DNAs) at national level. Since then the issue about the CDM's contribution to SD has not directly been addressed in international policy negotiations. Rather, it has been repackaged and addressed indirectly in debates about 'programmatic CDM' (Baron and Ellis 2006; Figueres 2005) and in the research literature. Theoretically, different approaches and definitions of SD exist, but in which is the focus of this review. For a theoretical introduction see chapters two and three in Markandya and Halsnæs (2002). In the methodological literature there seems to be a consensus that SD encompasses at least three dimensions: the social, the economic and the environmental dimensions (Kolshus et al. 2001; Najam et al. 2003; Olhoff et al. 2004).

Early studies from 2000–2001, before the Marrakesh Accords, try to analyze the possible future contribution of the CDM to SD. Three studies aim to predict, respectively, how far the CDM will advance SD goals (Austin and Faeth 2000), whether the CDM will further or impede SD (Banuri and Gupta 2000), and whether the CDM can be a leverage for development (Mathy et al. 2001). A fourth study argues for the inclusion of community forestry projects in the CDM

based on significant co-benefits such as rural development and biodiversity (Klooster and Masera 2000). Common to the studies is a lack of CDM project data, as it is too early in the CDM's development for sufficient evidence to be available. Instead, the studies use data based on, for example, literature reviews from potential CDM projects in Brazil, India and China (Austin and Faeth 2000), simulation and modeling of the leverage effect of CDM investments on development (Mathy et al. 2001), or assessments of the impact of CDM investment on SD using three different economic approaches (Banuri and Gupta 2000).

Erik Haites and Stephen Seres (2008) has analyzed the claims of technology transfer made by project participants in the project design documents for 3296 registered and proposed CDM projects. It finds that roughly 36% of the projects claim to involve technology transfer, which accounts for 59% of the estimated annual emission reductions, indicating that projects claiming technology transfer are, on average, substantially larger than those that make no technology transfer claim. It also finds that about 30% of unilateral projects, 40% of projects with foreign participants and 30% of small-scale projects claim technology transfer, as compared to 36% of all projects. The study concludes that technology transfer is more common for larger projects.

ISO 14001

In recent years, as a result of growing economic and social pressures, companies have reconsidered their attitude to the environment. A firm's ability to respond to environmental pressure determines its relationship with stakeholders and, therefore, the achievement of sufficient social legitimacy to protect their profits. A valid response to institutional pressure regarding environmental affairs is ISO 14001 certification (Bansal and Bogner 2002). This voluntary, international standard, created in 1996 by the International Organization for Standardization (ISO), enables firms to inform stakeholders of the application of an Environmental Management System (EMS). The ISO 14001 standard defines EMS as "the general part of management that includes the organizational structure, the activity planning, the responsibilities, the practices, the procedures, the processes and the resources to develop, implement, carry out, and revise the environmental policy and keep it up to date." In brief, and according to Boiral (2007), ISO 14001 represents both an internal management tool and a way of advertising an organization's legitimacy among stakeholders. Although voluntary ISO 14001 certification does not guarantee a specific level of improvement in environmental performance. There is empirical evidence (for example Potoski and Prakash 2005 or Link and Naveh 2006) that this standard does help to improve the environmental performance of organizations. Indeed, when an organization obtains ISO 14001certification, it means that it meets a series of requirements aimed at reducing its impact on the natural environment. According to Link and Naveh (2006), these requirements can be summarized as follows: the development and adoption of an environmental policy to which top management is committed; the design of a planning process that identifies all environmental requirements and defines objectives and targets for environmental improvement; the clear definition and assignment of responsibility for environmental management, in addition to programmes for training, increasing awareness and developing skills among employees; the availability of a system for checking and taking corrective action and a system for monitoring, reporting and prevention; and the establishment of a management review process which guarantees continuous improvement.

Environmental management literature focused on the study of economic repercussions of ISO 14001 certification is usually based either on case studies that are difficult to generalize (as in Darnall et al. 2000; Rondinelli and Vastag 2000 or Boiral 2007) or on subjective measures related to manager perception (as in Delmas 2001; Melnyk et al.2002; Montabon et al. 2000 or Link and Naveh 2006).

The findings of the research (Jill Gravender et al,) suggest that the ISO 14001 standard is a helpful management tool. It encourages firms to commit to environmental stewardship and pollution prevention. The majority of surveyed firms stated that the overall benefits outweighed the cost, and that they had noted an improvement in environmental performance, internal communications, and competitive advantage as a result of implementing the standard. Surprisingly few firms experienced significant constraints in obtaining ISO 14001 certification. However, several managers did express concern with the potentially negative legal ramifications of voluntary disclosure of environmental actions or liabilities associated with the auditing component of the standard. Matouq Mohammed (2000) found ISO 14001-based EMS has had a great effect on a firm's environmental status as certified firms have claimed that natural resources such as fuel, water, and paper consumption have been more efficiently managed after adopting the system.

Implementation of the system causes the firms to consider the role of the local people and the government in more effectively involving the local people in the firm's daily environmental activities. It also helps to enhance the environmental awareness among the local people. Adopting the system also promotes a better relation within the enterprises affiliated to the same group.

On the other hand, the results obtained do not suggest clear evidence that the economic impact of ISO 14001 certification is negative for more polluting and more internationalized firms (Joaquín C., et al., 2009). There are sound economic and business reasons for developing Environmental Management Systems. Some companies still fight environmental standards that actually could enhance their competitiveness, but there will always be competitors who take a pro-active stance on environmental issues and these are the companies that will win in the 21st century. Others must start to recognize that environmental improvement is an economic and competitive opportunity, and that ISO 14001 can be an important element in modern business survival (Sally L Goodman et al., 1998). Although there is extensive theoretical and empirical literature regarding the relationship

between environmental and economic performance, there is no consensus regarding the sign of this relationship. Indeed, although a growing movement—under the "It Pays to be Green" hypothesis—(Porter 1991; Porter and Van der Linde 1995; Hart and Ahuja 1996; Russo and Fouts 1997; Konar and Cohen 2001; King and Lenox 2002) replaces the traditional perspective that there is a trade-off between environmental and economic results, recent empirical research still finds a negative or insignificant relationship (e.g. Filbeck and Gorman 2004; Telle 2006 or Ziegler et al. 2007).

III. Discussion and Findings

CDM is an agreement between different international bodies (between developed and developing countries) to develop and implement system worldwide to ensure sustainable development. It is also an effort to honor various organizations and countries, which have involved and have contributed systematically in the growth while saving the environment. Application of ISO standard to CDM projects has the strategic advantages like:

a) Encourage alignment and integration of business and environmental efforts.
b) Facilitates coordination and improves control
c) Produces consistency between projects around the world (potential for economies of scale and advances on the learning curve)
d) Reduces uncertainty and decreases risk
e) This new initiative has legal implications in terms of fixing responsibilities to the erring unit; provision for granting credits to those who reduce the carbon emissions (popularly known as carbon credits) is a revolutionary step. Simultaneously, the availability of a highly refined environment management system, generally referred as EMS or ISO 14001, has certainly played a vital role in the implementation of CDM in the contemporary scenario of ecological environment.

Major feature of CDM are:

A. Sustainable development
B. Technology transfer
C. Foreign investment

A) Sustainable Development as per CDM and ISO14001

Development of a system or a process is expected to leave behind; its early signs of presence, development which is sustainable is the only type which is acceptable. But its cost is much higher than an un-organized development, because development is expected as sustainable only if it does not result in degrading of the ecosystem. For differentiating the development from sustainable development a robust EMS is needed. Some feature (as detailed below) ISO 14001 are highly suitable to quantify the above said difference. Environmental Policy: Environment policy of an organization is defined by the management prior to its implementation. This ensures commitment to continual improvement and prevention of pollution, a commitment to comply with all applicable legal requirements for its own environmental policy defined at the beginning. ISO 14001 under this clause binds the organization to make its policy public.

As per CDM clause an organization has an obligation to continually improve and prevent pollution there by implementing cleaner mechanism continually. James E. Haklik has also identified that sustainable development (a feature of CDM) can be achieved through implementation of ISO 14001. He has identified clauses like environmental aspects (4.3.1), general requirement (4.1) environment policy (4.2) and training awareness and competence (4.4.2) more relevant to the CDM. These clauses of ISO14001 shall be useful in terms of; awareness of the impact of sustainability, exception of responsibility to ensure sustainability, reduction of harmful impacts and community responsibility while implementing the CDM.

B) Technology Transfer as relevant in CDM and ISO14001

One of the major agreements in Kyoto protocol was that the CDM must ensure transfer of technology between the developing nations and the developed nations. It has been seen that after the establishment of CDM in 1996 there is hardly any transfer of technology reported in literature as a consequence of implementation of CDM. In our opinion although there are some feature of ISO 14001 that must result in transfer of technology but these are not sufficient so as to actually attract the transfer of technology.

Clauses of ISO 14001 which support the transfer of technology:

1. General requirements; since it ensures documentation of all procedures and practices transfer of technology is facilitated.
2. Resources roles, Responsibility and Authority (4.4.1); since under this clause the management ensures the availability of resources like human resources specialized and skilled man power organizational infrastructure, technology and financial Resources, the transfer of technology becomes convenient and hence physical moreover organization top management is expected to appoint specific management representative to ensure the implementation of environment management system. It can also recommend the steps needed to ensure improvement in the existing technology. Hence importing or exporting of the new technologies is also favored in the existing ISO 14001 system.

C) Foreign Investment

As one of the important decision taken in CDM is to make provision for the purchase or sale of carbon credits the idea behind the sale and purchase process is to put pressure on an organization to definitely achieve the commitments to reduce GHG emissions and establishment who told to earn certain number of carbon credits is not able to achieve the

targets then it has to buy the credits from some developing countries on payment basis.

As per clauses 4.1 (general requirements) In order to ensure continual improvement in EMS, an establishment needs to minimize GHGs emissions. When such Establishment is not able to significantly reduce GHGs emission then foreign investment is the only option left to earn carbon credits and hence qualify for ISO 14001 clause 4.1. Therefore, ISO 14001 is universal in its nature and is generally found in synergy with any other international protocol establishment or yet to be established for saving the environment.

There are http://toi.in/Q-1SLY e many issues related to CDM implementation can be addressed through ISO 14001 few are listed below:

f) Project steps Key issues Solution through ISO 14001
g) Project conceptualization

The project developers are often not sure whether a project being undertaken by them will be eligible for CDM. An ISO 14001 certified unit must have a regular data of emission which can be helpful in claiming the CER PDD preparation The data for developing the baseline case are difficult to obtain in many cases. The available methodologies are limited, but the EB is constantly approving new methodologies. Demonstrating additionality can be difficult. The services of a consultant for PDD preparation may prove expensive.

An ISO 14001 certified unit needs to maintain emission record as per clause No.4.4.4, which can be used to project the baseline. Monitoring and verification Rigorous monitoring and verification contribute to transaction costs, which can make smaller projects financially unviable, although rules for smallscale projects provide relief. Data from ISO 14064 clauses can be helpful in reducing transaction cost as it provides UP desirable in CDM Potoski and prakash (2006) discussed whether FDI inflows encourage the adoption of ISO 14001 among the host country`s firms. MNCs critics are correct, then FDI inflow should be associate with low level ISO 14001certification. If FDI supporters are correct, then we expect to find the opposite

ISO 14000 environmental management tools can be successfully applied to CDM projects to ensure that projected CER credits from these projects are realized.

From the review of the literature on how the CDM contributes to SD a consensus is emerging that the CDM is beginning to do what a true market is meant to do. It is widely documented that this involves trade-offs between the two goals of the mechanism in favour of producing low-cost emission reductions at the expense of achieving SD benefits. The critique is put forward that "the CDM does not work" in that it does not drive SD and does not fund renewable energy projects or carbon forestry projects with high development co-benefits. However, the problem can be turned around. The real problem is that the CDM works perfectly as it produces the lowest-cost emission reductions. Left out of the market, however, is the SD benefits. While rhetorically mandated in the Kyoto Protocol, they are not monetized and therefore play a limited role in directing investments.

The policy implication of the main challenge is how to respond to the fact that left to market forces; the CDM does not significantly contribute to SD in developing countries. In a report entitled 'Realizing the Development Dividend: Making the CDM Work for Developing Countries,' the problem has been phrased this way: "Will the CDM's sustainable development objective become a victim of the success of its market mechanism?" Five key issues of concern are identified in how the CDM is failing to achieve SD as mandated in the Kyoto Protocol:

(1) Defining SD,
(2) Lowering transaction costs,
(3) Managing the market,
(4) Access to finance and use of overseas development assistance, and finally,
(5) Negotiating the CDM post 2012.

It emerges from the discussion that the socio-economic development potential of CDM projects is ambiguous for rural poverty alleviation in India. The benefits of the projects focusing on improving energy efficiency in industries, fossil fuel switching in industrial units and destruction of HFC-23 would remain largely "firm-specific" and are unlikely to have an impact on rural poverty. The social development objective is not at the heart of formulation of these projects. Even their PDD offer just lip service regarding expected contribution to socio-economic development of the masses, particularly in rural areas.

A sectoral approach to the CDM has been proposed specifically to enhance this contribution. Various definitions have been proposed, namely a policy-based approach, large-scale bundling of projects, programmatic project activities aggregating dispersed actions which are coordinated by one enacting agent, and sectoral baselines where everything that is below the baseline would be credited. Each one of them is an attempt to transcend the single-site approach that has hitherto prevailed. A sectoral CDM would by definition be better suited to achieving sector-wide transformations and might in particular give a boost to renewable energy, energy efficiency and transport projects which are difficult to fit into a single-site approach. It would also resolve the perverse incentives issue by rewarding governments for implementing ambitious policies.

Finally, we draw the attention on three limitations of our analysis. First, we consider only projects aimed at increasing energy efficiency (for instance, the substitution between alternative types of energy or carbon sequestration is ignored). Second, we assume a small country with constant input (capital and energy) and output prices. Third, since the host county is assumed to be small, we have ignored its impact on

the stock of greenhouse gases and, accordingly, the potential damages of global warming on the country. It would certainly be interesting to remove these three limits to test the robustness of our results in a more general context.

Possible Areas of overlap between ISO14001 and Clean Development Mechanism

1. Clauses of ISO 14001 which can help in achieving CDM projects.
2. Major features of CDM which we can also achieve through ISO 14001

How ISO 14001 is related with CDM?

1. The availability of a highly refined environment management system, generally referred as EMS or ISO 14001, has certainly played a vital role in the implementation of CDM in the contemporary scenario of ecological environment.
2. Major features of CDM are
   (a) Sustainable Development
   (b) Technology Transfer
   (c) Foreign Investment

(a) Sustainable Development (CDM) related to ISO14001

1. Some features of ISO 14001 are highly suitable to establish the sustainable development.
   I. Clause 4.2 (Environmental policy) includes continual improvement, which helps in achieving sustainable development.
   II. Clause 4.1 (General requirement)
   III. Environmental aspects
   IV. Clauses 4.4.2 (Competence, training and awareness) and (Documentation) are helpful in achieving sustainable development.

(b) Technology transfer (CDM) related to ISO14001

I. One of the major agreements in Kyoto protocol was that the CDM must ensure transfer of technology between the developing nations and the developed nations.
II. Some features of ISO 14001 that may result in transfer of technology.
   a) Clause 4.1 (General requirements) since it ensures documentation of all procedures and practices transfer of technology is facilitated.
   b) Clause 4.4.1 (Resources, role, responsibility and authority) - It recommends the steps needed to ensure improvement in the existing technology. Hence, importing or exporting of the new technologies is also favored in the existing ISO 14001 system.

(c) Foreign investment (CDM) related to ISO14000

Clauses 4.1 (general requirements) of ISO 1400 requires:

I. In order to ensure continual improvement in EMS, an establishment needs to minimize GHGs emissions.
II. When such Establishment is not able to significantly reduce GHGs emission then foreign investment is the only option left to earn carbon credits and hence qualify for ISO 14001 clause 4.1.

Other issues which can be addressed by ISO 14001

Project steps	Key issues	Solution through ISO 14001
Project conceptualization	The project developers are often not sure whether a project being undertaken by them will be eligible for CDM.	An ISO 14001 certified unit must have a regular data of emission which can be helpful in claiming the CER
PDD preparation	The data for developing the baseline case are difficult to obtain in many cases. The available methodologies are limited, but the EB is constantly approving new methodologies. Demonstrating additionality can be difficult. The services of a consultant for PDD preparation may prove expensive.	An ISO 14001 certified unit needs to maintain emission record as per clause No. 4.4.4, which can be used to project the baseline.
Monitoring and verification	Rigorous monitoring and verification contribute to transaction costs, which can make smaller projects financially unviable, although rules for small-scale projects provide relief.	Data from ISO 14064 clauses can be helpful in reducing transaction cost as it provides UP desirable in CDM

IV. Conclusion and Future Prospects

- CDM project cycle requires performance of specific project management activities to acquire CER credits in synergy with ISO 14001 management system which provides flexible internationally recognized environmental management frame work.
- ISO 14000 environmental management tools can be successfully applied to CDM projects to ensure that projected CER credits from these projects are realized.
- The Clean Development Mechanism (CDM) growth prospects in the market shows a great promise with a lot of potential in terms of revenue generation.
- Growth of the Clean Development Mechanism (CDM) market is likely to be great by 2026 due to key factors like manufacturing activity.
- As per the prevalent current market situation there seems to be a major upward trend.

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