

Climate Change Mitigation Projects in India:

Incorporating Sustainable Development Concerns

Training Module 1

Adopting Sustainable Development *What's in it for business ?*



Development Alternatives
New Delhi

for the trainer...

Who are the target audience for this module ?

- Senior and Middle level management from the energy sector and other sectors
- The objective of the module is to demonstrate to the management that it actually pays to become clean, even in the absence of other financial and economic /fiscal incentives.
- Certified Emission Reductions (CERs) act as catalyst to the process of adopting sustainable business practices

Set Up

- Number of participants : 15 to 20
- Duration of training : Half a day
- A room with plenty of wall space.
- Seating preferably in a U- shaped or semicircular manner.
- Equipment Required :
 - Projectors
 - Flip charts and plenty of coloured paper slips
- Markers

Introduction

1. Introductory exercise : 5 min. X No. of participants

Each participant gives a brief account of

- **Who** s/he is and what organisation does s/he represent
- **What** is the purpose behind her /his attending the workshop
- **What** type of expertise/knowledge s/he would like to achieve at the end of the workshop
- **What** does s/he understand by sustainability
- **To what** extent does s/he think that her organisation is aware/ committed to adopting sustainability principles

The same objective may be attained using slips of paper and filling up a flip chart

Background on sustainable development

- Sustainable Development is NOT an environmental movement, but a community movement
- Living within the carrying capacity of the earth is a basic component of sustainability
- Sustainable development is not only sustained growth
- Pollution prevention is cheaper than pollution abatement
- A sustainable firm /industry seeks to generate short term and long term values by treating wastes, cleaning up the workplace and lowering costs per unit of output produced
- Sustainable development is a long term view of a community that conserves resources by putting every input to its most profitable use and minimise wastes and reduces local and global pollution

The purpose of this section is to introduce the participants to the concept of sustainability and sustainable development. By the end of this section, participants will understand sustainability as a concept that includes a community vision, resource conservation and a long-range perspective that includes all the members of the community and links the environmental, social, economic and technological aspects of the community. Participants will also understand how

to use indicators, i.e. as tools to measure sustainability in various contexts.

What is sustainable development ?

Common terms and definitions

“.....development meets the needs of the present without compromising the ability of the future generations to meet their own needs”

“.....an evolving process that improves the economy, the environment and the society for the benefit of current and future generations.....”

The four dimensions of sustainable development are social, economic, environmental and technological well being

1. Sustainability : does not mean utopia. A sustainable community is a form of human existence that is able to continue indefinitely while allowing its members to flourish in a way that does not impinge upon the Earth's capacity to produce and generate resources. Sustainability means that we continually work to make things better, and that our systems help rather than harm the process.
2. Development : Means changing for the better. Development is NOT growth.
3. Sustainable development : A development pattern that is constantly changing in order to attain higher and higher levels of human and ecosystem development in a sustainable manner is called sustainable development.
3. The advantage of using several definitions for sustainable development is that having different definitions provides many ways to discussing a rather difficult concept.

Sustainability - in terms of business practices

Products and services are ecologically safe throughout their life cycle

- Processes and technologies minimise or eliminate hazards and wastes
 - Workers are cared for, their skills continuously developed
 - The firm enjoys a “green reputation” in the community
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- ◆ *Products and services conserve on resources and are not harmful throughout their life cycle*
 - *consider entire life cycle*
 - *keywords are : durable, repairable, recyclable and compostable*
 - *minimal and appropriate energy use*
 - ◆ Production processes are designed and operated to conserve resources (including energy) and minimise hazards and wastes
 - ◆ Workers are a company's most important resource
 - ◆ Communities, especially those surrounding the facility, are treated with respect and care
 - ◆ Economic viability does not require unsustainable use of resources or ever-increasing consumption of energy and materials
 1. Sustainability is a must for CERs but even without CERs, the activities like CCMPs must be sustainable.
 2. Sustainable production includes processes that are ecologically sound, preserve resources and energy, and also embodies a company mindset that places high value on employees and communities
 3. How a company measures sustainable production will depend upon the particular product or service.

The key points that need to be explained are :

- ◆ *the “sustainable rate” will be derived from the rates of use of materials and energy as used by the industry, and compare it with the rates of use by the facility.*
- ◆ *There has to be clear stress on the use of energy from renewable energy sources and on conservation of energy, since the audience will be from the energy sector and other sectors that are concerned about energy use and its conservation.*
- ◆ *Worker satisfaction should be at the cornerstone of all assessments.*

Incentives for adopting sustainable practices

Financial gain - Pollution avoidance is less costly than pollution control

- ☐ Stronger enforcement of environmental regulations
- ☐ Layering of environmental regulations
- ☐ Reduced risk of control costs from future domestic environmental requirements
- ☐ Reduced risk of control costs from meeting future international environmental standards

Boost profits by substituting knowledge for material inputs

- ☐ reduces inputs to production (energy, water, materials) per unit output
- ☐ reduced dependence on external inputs insulates against price volatility
- ☐ spill-over benefits in terms of enhanced managerial and technical capacity

New opportunities in “green” markets

- ☐ CERs are contingent upon the process having contributed to sustainable development
- ☐ Final users, especially in overseas markets, are interested in sustainability
- ☐ Potential for revenue growth in new markets for products and services
- ☐ Gain trust/ identify emerging markets by forging connections with communities.

Enhance profitability by generating revenues from nature’s services through ecosystem protection and restoration

- ☐ Offset degradation from other operations.
- ☐ Use natural systems to reduce operating costs.

Overall benefit to the workers and other factors of production

1. *Indicative examples and experiences must be cited wherever possible, to explain a point.*
2. *The short and longer term objectives of being sustainable need to be explained. In some cases, the ‘cleaning up act’ may prove to be relatively expensive in the shorter run, but pay dividends in the long run.*
3. *Since the audience includes climate change project developers, the linkages between overall sustainability and cleanliness of a firm /industrial group and carbon credits that earn money should be clearly explained.*

Case-study Analysis

Co₂ Mitigation by Gainful Utilisation Of Waste Heat For Generation Of Electricity In A Cement Plant

Information about the firm /project

1. Organisational Characteristics :

- ◆ Strong Management team and Skilled Human Resources Dept.
- ◆ Capacity to Monitor Progress
- ◆ Management Commitment for Sustainable Power Production

2. Capacity to measure sustainability exists within the firm as a unit

3. The firm already has a monitoring team

4. Incentives : The firm may have

- ◆ Economic Incentives
- ◆ Considerations for a ‘Green’ image in long run
- ◆ Concerns to provide better working conditions

PROJECT PROFILE

- Company operates 2.0 million tonnes per year
- Turnover of US \$ 100 million
- The plant is located at about 470 Kms. from Delhi on National Highway-8 connecting Delhi-Jaipur-Ahmedabad

Note : *This plant is one of the lowest energy consuming cement plants in the world*

Specific Energy Consumption During 1998-99

- Electrical Energy (Kwh/T Cement) 78.24*
(Industry avg. 110-115 KWH / T Cement)
- Thermal Energy (Kcal/Clinker) 730.94*
(Industry avg 800 Kcal / Kg Clinker)

Project life 15 yrs

Projected carbon emission saving

- Annual basis - 76000T CO₂/Year
- During the project life of 15 yrs - 1140000 T CO₂ (0.31 Million Tonnes C)

PROJECT COST

Cost of the project (Rs.) 612 million / (US\$) 13.5 million

Cost Saving Due To Installation Of Waste Heat Recovery System For Electricity Generation :

Cost of installation of 9 MW WHR system (Caldyn System) :
US\$ 13.5 Million

Cost saving due to use of power generated from W.H.R. system
@ Rs.1.35 / KWH : US\$ 2.13 Million/Year

Simple pay back period for installation of W. H. R. System :
6.34 Years

CO₂ Mitigation Cost By Waste Heat Recovery System For Electricity Generation

Saving of GHG emission : 0.31 million tons carbon over 15 year of total project life

Cost of carbon mitigation : 43.54 US\$ per ton carbon

11.86 US\$ per ton CO₂

5. Reason for measuring progress :

- ◆ Economic /CERs

End Objectives of the Project

- ◆ Effective Utilisation of Waste Heat for Generation of Electricity
- ◆ Reduction in Carbon Emission Per Unit Production of Cement
- ◆ Reduction in Transmission and Distribution Losses
- ◆ Reduction in Cost of Production of Cement
- ◆ Saving of Natural Resources of Fossil Fuels

Energy Conservation Measures

- ◆ Optimisation of process /operating parameters
- ◆ Retrofitting of energy efficient equipment system

- ◆ Effective utilisation of high temperature waste gases for generation of electricity

Incentives for being more sustainable:

Case-study Analysed

Financial gain. Pollution avoidance is less costly than pollution control -

- ◆ Waste Heat Recovery saves on the electricity bill (US\$ 2.13 million per year) for the next 15 years, thereby saving a minimum US\$ 31.95 million over the project lifetime (assuming no rise in tariffs)
 - ◆ **Boost profits by substituting knowledge for material inputs -**
 - ◆ reduced dependence on external inputs insulates against price volatility.
 - ◆ spill-over benefits in terms of enhanced managerial and technical capacity
1. *Need to measure all improvements and changes, so as to assess the contribution of each and every changed process towards sustainability.*
 2. *In the face of constantly changing policies and structures of Governments in developing countries, reduced dependence on external inputs is an insurance against risk.*
 3. *There are spillover benefits to be reaped. For example, having an ETP (emission treatment plant) may help securing a loan at soft terms from the Government agencies.*
 4. *Examples have to be introduced to make the point clearer.*
 5. *The discussion should, as much as possible, concentrate on climate change applications. For example, renewable energy and energy efficiency firms may be contributing towards the mitigation of climate change, but they may not necessarily be “sustainable” in all senses of the term.*
 6. *CERs need to be mentioned as a huge source of income generation in the future, for which the ground needs to be laid out now. The linkage between sustainable development and the CERs need to be highlighted whenever possible.*

Incentives for being more sustainable

Case-study Analysed

New opportunities in “green” markets

- ◆ CERs : Projected carbon emission savings are 0.31 million tonnes of carbon, monetized at the rate of \$ 5.00 per tonne, can mean \$ 1.55 million for the project proponents.
 - ◆ **Enhance profitability by generating through ecosystem protection and restoration**
 - ◆ The project earns extra money through reduction in energy bills and the potential gain to be derived from the sale of carbon credits. The net potential positive impact of the project in nominal terms over the next 15 yrs from the above sources is \$20 million.
 - ◆ **Overall benefit to the workers and other factors of production**
 - ◆ The project, by virtue of waste heat recovery, would generally reduce temperatures at the plant level by a degree or two. This makes the workplace more comfortable, and can be read off from the rates of absenteeism before and after the retrofit.
 - ◆ The project leads to increased earnings which may flow as dividends to company share holders.
 - ◆ Finally, the project by utilising waste heat conserves space and energy and reduces wastes, thereby making better use of its resource endowments.
1. Information to be provided on the existence of “green” markets. For example, the audience should be informed about the SO₂ Trading that took place in the US, the Montreal Protocol Multilateral Fund for ‘Ozone friendly’ projects and finally the initiatives that exist with regard to climate change. In this context, mention has to be made on the availability of funds for climate change mitigation projects as well as a carbon market that opens up

a whole new window for generation of resources

2. Ecosystem protection can lead to increasing bottom lines. More examples may be used for supplementing the statement.
3. Incentives need to be analysed from various stakeholder groups. The target audience for the module is the top management of various firms in the Indian energy sector. As such, the approach to conduct the training should be from an all encompassing perspective that takes into account worker's benefits, shareholder interest and company vision as key parameters influencing the decision to adopt sustainable processes.