

Clean Development Mechanism in Industry: A Review

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Abstract- *Deregulation of the energy industry, concerns over the security of energy supplies, and the effect of CO₂ emissions on climate change have generated a growing interest in energy efficient systems, and particularly in CHP.*

The Clean Development Mechanism (CDM) is an arrangement under the Kyoto Protocol allowing industrialized countries with a greenhouse gas (GHG) alternative to more expensive emission reductions in their own countries. It also assists developing countries in achieving sustainable development by promoting GHG emission reduction projects that generate emission credits (CERs).

Keywords- *CDM, CERs, Green House Emission.*

I-INTRODUCTION

A review of literature on clean development mechanism and its analysis in different application industries is presented here with a view to identify the method to ensure the applicability of these to the present environmental issues.

Adhikari et.al.(2008) gives an overview of the status of clean development mechanism (CDM) portfolio in Thailand. With the few selected technologies suitable in the context of CDM opportunities in Thailand, the sustainability benefits and barriers to their implementation are also discussed in detail.

De Souza (2008) speculates that Clean Development Mechanism projects will be strategic to build a positive image concerning the social responsibility and sustainability of the business in the Brazilian sugar cane sector.

Pulate (2010) also discussed the feasibility of bagasse based cogeneration in CDM market grid.

Purohit and Michaelowa (2007) assesses the maximum theoretical as well as the realistically achievable CDM potential of bagasse cogeneration in India and estimates indicate that there is a vast theoretical potential of CO₂ mitigation by the use of bagasse for power generation through cogeneration process in India and highlights that CDM could help to achieve the maximum utilization potential more rapidly as compared to the current diffusion trend if supportive policies are introduced.

Purohit and Michaelowa(2008) made an attempt to estimate the CDM potential of SWHs in India. and estimates that there is a vast theoretical potential of CO₂ mitigation by the use of SWHs in India. From a macro-economic point of view this makes sense if the sustainability benefits are deemed sufficiently high to warrant promotion of this project type.

II- CDM (CLEAN DEVELOPMENT MECHANISM)

The Clean Development Mechanism (CDM) is an arrangement under the Kyoto Protocol allowing industrialized countries with a greenhouse gas reduction commitment to invest in emission reducing projects in developing countries as an alternative to what is generally considered more costly emission reductions in their own countries. Under CDM, a developed country can take up a greenhouse gas reduction project activity in a developing country where the cost of GHG reduction project activities is usually much lower. The developed country would be given credits (Carbon Credits) for meeting its emission reduction targets, while the developing country would receive the capital and clean technology to implement the project. Carbon credits are certificates

issued to countries that reduce their emission of GHG (greenhouse gases) which causes global warming⁽⁵⁾.

Carbon credits are measured in units of certified emission reductions (CERs). Each CER is equivalent to one tonne of carbon dioxide reduction.

Under IET (International Emissions Trading) mechanism countries can trade in the international carbon credit market. Countries with surplus credits can sell the same to countries with quantified emission limitation and reduction commitments under the Kyoto Protocol. Developed countries that have exceeded the levels can either cut down emissions, or borrow or buy carbon credits from developing countries.

III- CDM ANALYSIS

The discussion here for restricting the design of a thermal system with reference to its environmental impact. The management system follows the requirement of continuous improvement of the products and services that the industry provides. For utilities that own thermal heat and power plants, this includes more environmentally-friendly production of heat, power and other products. A purchase of a new plant to replace an old plant that has reached its lifetime sets restrictions on the plant design. Some of the restrictive parameters are emissions to air and water, and waste to ground, which all can be traced back to materials, chemicals and fuels used to build and operate the plant. Major environmental constraint is the environmental politics of the country or region where the thermal system is located. This legislative factor is rather unsure however since environmental policies and environmental taxes and fees change with time more or less rapidly. The environmental taxes and fees are here regarded as environmental boundary conditions and not as purely economical, since they depend on the fuels used and the emissions that are discharged. Furthermore, the price of electrical certificates, introduced to the Swedish electricity market in May 2003, and the future cost of allowances of discharge of CO₂ equivalents due to the Swedish ratification of the Kyoto Protocol, are also considered as environmental parameters, rather than economical. The CHP plant, which today can operate as a stand-alone steam cycle or as a combined cycle with additional power generation with bagasse as a fuel which is renewable source of energy. In 1992 the United Nations Conference on Environment and Development (UNCED), also called the 'Earth summit', was held in Rio de Janeiro, Brazil, where, among other things, 'The Rio Declaration' was signed. This declaration is a statement of principals regarding the climate change. The measures mentioned in The Rio Declaration, however, were shown

to not be enough to accomplish the mitigation of the climate change – a legally binding document was required. This led to the formulation of the Kyoto Protocol, and the first version of this was available in 1997. [100]. It is by this Protocol that the countries (who have ratified it) operate, and it is here the decrease in GHG emissions, related to the levels in 1990, are stated for each country³. For this Protocol to be legally binding, at least 55 of the countries have to ratify it and the total amount of GHG emissions that these countries are responsible for has to be at least 55% [84]. The Kyoto Protocol states three flexible mechanisms to be used to carry out the reduction of GHG discharged to the atmosphere. These mechanisms are Emissions trading, Joint Implementation (JI) and Clean Development Mechanism (CDM). These mechanisms should be considered as supplementary means to the domestic measures for achieving the commitments under the Kyoto Protocol. The mechanism for which most attention has been given until now, is the emissions trading of allowances. As an example of actions taken for this mechanism, the framework prepared in the European Union (EU) is suitable. In the EU a 'burden sharing agreement' has been developed, assigning each country a commitment of decreasing GHG emissions by a certain amount. By the period 2008–2012 the EU is to lower its total emissions by 8% compared to the level in 1990. This naturally put pressure on the energy market (heat and power production) as well as electricity intensive industries (sugar, pulp- and paper industries, metal industries, and mineral industries), which are the business areas involved in the first phase between 2008–2012.

IV-CONCLUSION

The analysis of thermal system does not say anything about the environmental impact of the system during its operation.

The governments of many countries globe are introducing environmental policies and legislation. Indian government is also keen on reduction in pollution by promoting the industries to adopt new and renewable energy sources. These all have to be fulfilled to stay in business. The limits of different emissions are getting stricter every year and subsidies to guide developers in certain directions are among the measurements that have been introduced. To match with the environmental legislation, fees, and taxes, any analyst should try look thoroughly into the system affairs. CDM analysis, is one step towards the environment which considers the the reduction in CO₂ emissions from the industry particularly process industry. Many manufacturers and owners of thermal systems today

have or are planning to introduce environmental-management systems. This of course puts pressure on an environmentally-friendly enterprise. These all have to be fulfilled to stay in business.

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