

## Clean Development Mechanism Projects and Commitment of Included Parties in Iran

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### ABSTRACT

This research was aimed to study CDM projects in Iran. Kyoto Protocol includes three mechanisms, namely: emission trading, joint implementation and clean development mechanism (CDM). The last one that is clean development mechanism (CDM) is the only mechanism in which developing countries can participate in. These projects are applicable in fifteen different fields which comprise almost 60% of total registered projects of energy industries (renewable and nonrenewable resources). Iran has been unable to progress significantly in this field due to several factors such as lack of adequate infrastructures and skilled experts, and international sanctions. No carbon credit has been earned by Iran yet and just two of them are expected to be released by the end of 2012 for “Amir Kabir” and “Debal Khazaei” projects of cultivation and farming industries projects.

**KEYWORDS:** The Kyoto Protocol, Greenhouse gases, Clean Development Mechanism (CDM), Amir Kabir, Debal Khazaei.

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### INTRODUCTION

This study aims to investigate the role of Clean Development Mechanism (CDM) and the commitment of parties included in Annex II of The Kyoto Protocol. The Kyoto Protocol was codified and ratified in Kyoto, Japan (1997) by a number of countries to decide effective initiatives for reduction of greenhouse gases.

This question might be raised whether activities of the parties included in Clean Development Mechanism Projects were able to fulfill expected objectives of Kyoto Pact. And to what extent if the answer is yes.

#### (A) Reviewing on Implementation of Projects in Practice

CDM projects naturally include various fields and a thorough investigation of them can determine whether they have been able to reach the predefined objectives or not. This section lists fifteen different fields of implementing these projects first and then, evaluates activities of included parties and developing countries in hosting the projects. Moreover, the registered projects will be distributed according to their scale here. At last, this section will be concluded by comparing the extension of registered projects per each continent and contribution of the developing countries from Certified Emission Reduction.

A general picture from the status of CDM projects is made for following indexes:

CDM projects are executed in terms of fifteen fields below:

- 1) Energy industries (renewable and non-renewable sources of energy),
- 2) Energy distribution,
- 3) Energy demand,
- 4) Manufacturing industries,
- 5) Chemical industries,
- 6) Construction,
- 7) Transportation,
- 8) Mining / mineral production,
- 9) Metal production,
- 10) Fugitive emissions from fuels (coal, oil, gas),
- 11) Fugitive emissions from production and consumption of halocarbons and sulfur hexafluoride,
- 12) Solvent use,
- 13) Waste handling and disposal,
- 14) Afforestation and reforestation,
- 15) Agriculture,

Most of the projects are related to energy industries, either renewable or non-renewable sources having a contribution of 70.41%. Afterwards, waste disposal and control, manufacturing industries and fugitive emissions from fuels have second to fourth ranks with 12.79, 4.83 and 3.54%, respectively.

In other words, 3601 projects were associated with energy industries out of total 4424 registered projects with the first rank. Waste disposal and control, manufacturing industries, fugitive emissions from fuels and agriculture each with

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654,271,181 and 153 projects were ranked second to fifth, respectively. It must be noted that no project was registered for energy distribution, construction and solvent use yet [1-2].

In Islamic Republic of Iran, about 63% of the projects have been allocated to energy industries including refineries, power plants, renewable sources of energy production and etc. 20% of the projects were related to waste management and then, a great deal of projects were associated with collecting gases burnt at flares in oil & gas fields and refinery units. Oil & gas sector will get the first rank if the contribution of energy optimization is also considered, since most projects of energy industries belong to energy efficiency projects in oil & gas refineries or power plants [3].

From the eleven projects which have been registered by the Islamic Republic of Iran, only one of them is about fugitive emissions from fuels (coal, oil, gas) with the remaining projects being allocated to energy industries and energy distribution scopes.

A comparison with current situation in November 2007 demonstrated that energy industries are still at top but at different rate (53.04%), waste handling and disposal with the same rate, while fugitive emissions from fuels being 7.81% has dominated manufacturing industries (5.99%).

This indicates that at energy industries sector is still at top of CDM projects from 2007 to 2011 with the most methodologies being proposed in this area [4].

### **Comparative Evaluation of CDM Projects from Different Aspects**

#### **Comparing Activities of Developed Countries**

It can be seen from the figure that UK with 1526 projects, Switzerland with 1031 projects and Japan with 496 projects are placed first to third.

Iran is now cooperating with Norway & Netherlands each one in one project and with Switzerland in the remaining nine projects from total eleven registered projects.

#### **Contribution of Developing Countries in Hosting the Projects**

Developing countries are located at the other side of Clean Development Mechanism (CDM). They are not directly committed to reduce their greenhouse gases but have the opportunity to benefit from these projects to reach their own economic, social and environmental goals, i.e. sustainable development, technology transfer, increased employment and decreased poverty.

China having some 49.64% of the projects (2198 projects) was able to allocate nearly half of the projects. India with 19.56% (866 projects) is the most potential rival for China, while Brazil is located at third place with some 4.67% contribution (207 projects). However, the distance from first to third ranks is not rationally comparable.

It should be noted that in September 2008, China was second with 22.98% contribution after India having 30.81% contribution. Meanwhile, Brazil have experienced considerable downfall in 2012 as compared with 2008 having a share of 12.48%.

#### **Distribution of Registered Projects in terms of Scale**

CDM projects are divided into small scale projects and large scale projects according to the issued Certified Emission Reductions (CERs) that from 4460 registered projects, more than half of them with 58.65 percent are large scale and the remaining projects with 41, 35 percent are small scale.

For example, seven projects out of the eleven registered projects in Iran are small scale while the other four are large scale.

#### **Extension of Registered Projects based within Continents**

Various projects are being implemented in different continents, although at rather different rates. These projects are more frequent in Asia and Oceania. Afterwards, Latin America and Africa are located at second and third placed having 13.80 and 2.08%, respectively. Other countries have a contribution of just 0.43%.

A comparative look at statistics of 2008 and 2012 shows that the contribution of Asia & Oceania have been increased from 64.97% to 83.69%, but such a trend is not observed for Latin America or Africa. Instead, Latin American countries have revealed a decrease from 32.01% to 13.80% and African countries have also shown a reduction from 2.32% to 2.08%. The statistics is considerable about Latin American countries.

#### **Contribution of Developing Countries from Certified Emission Reduction**

A CDM project cannot obtain a Certified Emission Reduction (CER) as long as not registered. Moreover, the amount of CERs obtained by a project depends on the extent of greenhouse gases replaced as well as the crediting period selected.

Out of total number of 980, 445, 529 Certified Emission Reduction issued so far, the largest contribution is issued to China with more than half of them. India has the next rank while South Korea is placed third.

A comparison from 2008 to 2012 indicates that China has recorded an increase in the number of CERs. India and South Korea both have experienced increase from 13.97% to 14.64% and from 6.55% to 9.20%, respectively [5].

Interestingly Korea in 2012, sits in third place before Brazil's position has since.

The Clean Development Mechanism (CDM) was designed with two objectives: To contribute to local sustainable development in the host country and to assist Annex-I countries to achieve their emission reduction targets in a cost-efficient manner (UNFCCC 1997) [6]. 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? Sutter (2003) identified a trade-off between the two objectives of the CDM in favor of the cost-efficient emission reductions goal [7].

The Marrakech Accords affirm that “it is the host Party’s prerogative to confirm whether a clean development mechanism project activity assists it in achieving sustainable development” (UNFCCC 2002) [8]. Consequently, non-Annex I countries can define the sustainable development requirements for CDM projects in their country according to their own wishes. At the same time, most countries will not have the market power to considerably influence the global market price for emission reductions. Competition among non-Annex I parties in attracting CDM investments could, therefore, create an incentive to set low sustainable development standards in order to attract more projects with low abatement costs. This could lead to a “race to the bottom” in terms of sustainable development standards with non-Annex I parties undercutting each other to attract CDM investments (Kelly and Helme 2000) [9], thereby weakening the sustainable development objective.

### **Mechanisms of The Kyoto Protocol**

The effect on the global environment is the same irrespective of whether the GHG emission reduction is achieved in Annex I countries or non Annex I countries. Therefore, the countries have been given an option to meet their targets through one of the following three mechanisms provided under The Kyoto Protocol:

- Joint Implementation (JI)
- International Emissions Trading (IET)
- Clean Development Mechanism (CDM)

Out of three mechanisms of The Kyoto Protocol, CDM is the only mechanism where developing countries can participate and join in mitigating the climate change. Through CDM, the developed countries can implement GHG mitigation projects in developing countries at reduced costs.

### **Various Technologies Employed in Clean Development Mechanism Projects**

- A) combined cycle technology,
- B) landfill technology,
- C) solar power plant and solar chimneys technology,
- D) biomass technology,
- E) Combined Heat and Power (CHP) technology,
- F) wind turbines technology,

## **DISCUSSION**

### **CDM Projects in the Islamic Republic of Iran**

Empowerment plan of the Islamic Republic of Iran was initiated in 1998 from the first report of Climate Change to financially support international facilities of environment with cooperation of United Nations Development Program (UNDP) by Department of the Environment. This plan was towards commitments of Iran to United Nations Framework Convention on Climate Change (UNFCCC) which was signed by representative of Foreign Affairs in 1997.

#### **Contribution of Iran in Emission of Greenhouse Gases**

Iran’s contribution in emission of greenhouse gases is about 2.1% which has placed this country in 13<sup>th</sup> world ranking. The statistics is rather high and threatening with respect to Gross Domestic Production (GDP) and national economic output [10]. For example, emission of greenhouse gases was reported as 337 and 491 million tons of carbon dioxide in 1994 and 2000, while this amount must be reduced to 66 million tons according to GDP estimations by 2021.

#### **Iranian Subsections in Emission of Greenhouse Gases**

Major Iranian subsections in emission of greenhouse gases are listed below. IPCC (Intergovernmental Panel on Climate Change) procedures are always used to calculate emission of greenhouse gases in Iran [11].

- 1) Energy production and transformation: fuel ignition including production, transportation and consumption of energy carriers like power plants, refineries, industry, transportation, residential and commercial applications, agriculture and ignition of biomass.
- 2) Fugitive emissions: extraction and exploration processes of oil, extraction and exploration of gas, leakage and ignition of associated gases during processing, extraction and exploration of coal.
- 3) Mining / mineral production: production of cement and lime, consumption of limestone and dolomite, glass industries, production and consumption of asphalt and isogum, production of steel and aluminum, chemical and petrochemical industries such as ammonia production, food industries.
- 4) Agriculture: management of bestial dung and excreta, cultivation of rice, burning agriculture residues.
- 5) Afforestation and reforestation: reforestation and land degradation, making agriculture lands from forests.
- 6) Solid and liquid wastes: urban solid wastes, domestic and industrial waste water, liquid industrial wastes, human excreta.

#### **Contribution of Iran from Certified Emission Reduction of Carbon Market**

Six projects out of eleven registered projects in Iran are related to small scale projects on fuel switching which will be discussed later. One of large scale project is about fugitive emissions from fuels, which is implemented in offshore Norouz and Soroush oil fields.

#### **1- Large Scale CDM Project of Norouz and Soroush**

The first plan which was mentioned to utilize CDM in oil and gas sector was collection of associated gases from Khark and Bahregan regions. Its operations were initiated in 2004, followed by negotiations with several companies i.e. Statoil

(Norway), Shell (Netherlands), Total (France), Nippon Oil (Japan) and others between 2004 and 2006. It was September 2006 when an agreement was signed between National Iranian Oil Company (NIOC) and Stat Oil in this respect. However, after long discussions the contract was finally prepared in 2007, but Statoil gave up its cooperation [3].

## 2- Small Scale Projects

Having ratified the large scale project of Soroush & Norouz, six small scale projects were also registered in a short time. Interesting is that these six projects were all related to agro-industry and particularly cane:

- 1) Salman Farsi agro-industry,
- 2) Imam Khomeini agro-industry,
- 3) Debal Khazaei agro-industry,
- 4) Amir Kabir agro-industry,
- 5) Farabi agro-industry,
- 6) Mirza Kouchak Khan agro-industry,

Crediting period of all abovementioned projects were determined as 10 years with their counterpart party being Switzerland. Thereby, Iran was placed 25<sup>th</sup> in the ranking of countries having CDM beside Panama and Sri Lanka [12].

It is expected that the first CER would be earned by the end of this year [13].

### Potential Capacities and Opportunities

Islamic Republic of Iran has a significant potential for emission reduction of the greenhouse gases from the following points of view:

- 1) Energy
  - improved efficiency of energy [13],
  - fuel switching,
  - recovering of associated gases,
  - utilization of renewable and clean sources of energy,
- 2) Non-Energy
- 3) Capacity of OPEC Members and Their Performance

Generally speaking, since OPEC members have an economic structure based on subsidiary payment for fuel consumption, they lack the required stimulus to efficiently use energy. Therefore, emission of greenhouse gases due to economic activities is intensively high in these countries. In fact, they have a great potential for emission reduction because of their high rate of energy consumption. However, they show poor GDP in global economy. Thus, these OPEC members are significantly potential to benefit from CDM projects but the required stimulus must be somehow created [3].

A study on Iran in 2003 revealed that an income of 0.5 to 1 billion US dollars could be earned for this country from CDM projects. However, some critics argue that it is still negligible in comparison with oil revenues.

It must be noticed that mostly small enterprises benefit from these projects in the world. Therefore, it can be assumed that the income earned from CDM projects is fed into small enterprises to create new business environments for new people. Meanwhile, ROI content of these projects is considerably high with typical values being over 30% [3].

### Existing Barriers and Problems

Clean Development Mechanism (CDM) projects are exposed to some barriers and problems like any other project. Inexistence of proper and adequate legal frameworks as well as lack of skilled experts can be introduced as basic and important barriers of this process in Iran.

## Conclusion

Industrial activities in 20<sup>th</sup> century and unscientific utilization of nature, led to excessive accumulation of the greenhouse gases in atmosphere from burning of fossil fuels. This caused melting away of polar ices and rising levels of oceans and seas, as well as other adverse effects on environment during this era. Interference of thermal equilibrium between earth and atmosphere in addition to its dangerous consequences and dim perspective, were subjects of numerous international conventions for solving this global problem.

CDM projects are applicable in 15 different fields, while approximately 60% of the registered projects are related to energy industries (renewable and non-renewable).

Taking into account the application of this mechanism and the daily increasing number of these projects, it can be concluded that the mechanism has a key role in emission reduction of the greenhouse gases including carbon dioxide. For example, studying registered statistics of CDM projects indicate that they are rapidly growing, such that total 357 projects by October 2007 have reached 4424 projects in August 2012. However, in spite of these fast growing there are still far from reality. In other words, one should differentiate between undeniable importance of this mechanism for commitments of emission reduction and complete fulfillment of The Kyoto Protocol.

Furthermore, The Kyoto Protocol was approved to be extended in Durban (South Africa) Climate Change Conference in November 2011. Thereby, the second round of commitments will be launched after the first one at the end of 2017, or 2020 in another conference. Included parties were also committed to codify and specify the dominant regime of convention. Probably, by 2020 all countries must be committed for reducing emissions of the greenhouse gases.

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