

Global Warming, Kyoto Protocol, and the Need for Corporate Pollution Disclosures in India: A Case Study

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Abstract

This case has been used in the classroom where sustainability of the environment is being investigated. After a discussion on global warming, the topic focused on the efforts by the European Union to develop a number of steps to counter detrimental climate change and to reduce greenhouse gasses. The Copenhagen Climate Change Summit and the Cancun Conference were discussed. Eventually the discussion turned to less developed countries and their efforts to reduce greenhouse gasses. India was then singled out as a country that is less developed and a target for reducing its environmental imprint.

Key Words: Kyoto Protocol, Global Warming, Greenhouse Gases, Copenhagen Summit, Cancun Conference, Third World Countries

INTRODUCTION

Scientists, politicians and business leaders have been concerned about global warming for quite sometime because it has a damaging effect on the environment. In order to deal with global warming, world leaders signed the Kyoto Protocol in 1997, which went into effect in February 2005. They met again in Bali, Indonesia, in December 2007, to consider the next phase after the end of Kyoto Protocol, which will deal with global strategies and policies for containing global pollution, especially greenhouse gases (GHG). Meetings continued in Copenhagen in December 2009 with little progress. However, moderate progress was made in Cancun during the December 2010 meeting in terms of curbing greenhouse gas (GHG) emissions (Broder and Rudolf, 2010). Though almost all industrialized nations and some countries with developing economies, such as India and China, ratified the Kyoto Protocol to reduce pollution, the U.S is still holding out because it seems to be more concerned about economic growth than pollution emissions. Most countries that ratified the agreement have been given a timetable to reduce GHG, which will reduce environmental pollution and control global warming. The time table for reducing emissions, however, excludes developing countries such India and China during the first phase of carbon dioxide reduction that started in 2008 and ends in 2012.

The next phases of global pollution reduction will cover all countries that have ratified the Protocol. All signing countries including India and China are also expected to be required to reduce GHG emissions to a certain level. Irrespective of the fact whether firms in a particular country are now required to reduce carbon dioxide emissions to a certain level under the Kyoto Protocol or not, the stakeholders, especially investors, would like to have information on the firms' pollution performance, especially pollution reduction policies and strategies, so that they can properly evaluate operating performance of these firms and form their expectations about the firms' market performance. Therefore, it is critical that firms disclose reliable and comprehensive pollution-related information, especially on their pollution-related activities, pollution-related expenditures, strategies and goals to reduce pollution, future plans to deal with the problem, etc. Some countries have developed mandatory pollution disclosure requirements in some form or the other. Most countries, however, encourage disclosure of pollution information on voluntary basis. It is posited that voluntary pollution disclosures would serve useful purpose in market economies in helping investors to make their investment decisions, which will have a significant impact on allocation of financial resources among different sectors. Moreover, managers will be motivated to disclose pollution information on a voluntary basis to convey positive signals on the firms' future performance, to show that the firm is taking its social and pollution responsibility seriously, to create a positive image among consumers, and/or possibly to avoid mandatory regulations for disclosures.

Top-ten emitters

What follows is a ranking of the world's top ten emitters of GHGs for 2005 (MNP, 2007. (<http://www.adaptation-fund.org/>). The first figure is the country's or region's emissions as a percentage of the global total. The second figure is the country's/region's per-capita emissions, in units of tons of GHG per-capita:

1. China¹ – 17%, 5.8
2. United States³ – 16%, 24.1
3. European Union-27³ – 11%, 10.6
4. Indonesia² - 6%, 12.9
5. India – 5%, 2.1
6. Russia³ – 5%, 14.9
7. Brazil – 4%, 10.0
8. Japan³ – 3%, 10.6
9. Canada³ – 2%, 23.2
10. Mexico – 2%, 6.4

Notes

- These values are for the GHG emissions from fossil fuel use and cement production. Calculations are for carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and gases containing fluorine (the F-gases HFCs, PFCs and SF₆).
- These estimates are subject to large uncertainties regarding CO₂ emissions from deforestation; and the per country emissions of other GHGs (e.g., methane). There are also other large uncertainties which mean that small differences between countries are not significant. CO₂ emissions from the decay of remaining biomass after biomass burning/deforestation are not included.
- ¹ excluding underground fires.
- ² including an estimate of 2000 million tonnes CO₂ from peat fires and decomposition of peat soils after draining. However, the uncertainty range is very large.
- ³ *Industrialised countries*: official country data reported to UNFCCC

Firms in India

Indian firms' commitment and practices of disclosing pollution information, especially carbon dioxide information, is on a voluntary basis. Though there is no pressure on Indian firms to disclose pollution information, disclosure of pollution information by Indian firms, along with firms from other countries, is assuming greater importance with the development of global financial markets and with the expectation that all firms, including Indian firms, will be required to reduce pollution emissions as new phases of global pollution reduction are developed. Pollution disclosures by large Indian firms were compared to pollution disclosures by firms from the EU countries, Canada and Japan, because these are developed, industrialized countries and have ratified the Protocol. Pollution disclosures are industry specific, and disclosures differ across different industry groups. Pollution disclosures are more critical to firms belonging to the polluting industries, such as coal burning plants, steel, automobile, chemicals, paper products etc., than firms from other industries.

Insurance firms may, however, also be impacted by global warming. Even though property and casualty insurance companies are not major producers of pollution in general and specifically GHG emissions they have the potential to be greatly impacted by global warming. Information on pollution disclosures by firms belonging to certain industry groups will be useful to investors and regulators to evaluate pollution performance across industry groups.

Background

In ratifying the Kyoto Protocol, both India and China essentially agreed that GHG emissions needed to be curbed in the future and that they would participate in reduction of emissions in their respective countries. Although, in the initial phase of the Protocol (2008-2012) these countries are not required to reduce GHG emissions, they are expected to do so in the subsequent phases. With regard to other countries, the Protocol indicates that the EU countries agreed to an 8 percent reduction in emissions from a 1990 base year and they had a plan in place when the Protocol commenced in February 2005 (ENS 2007). Japan and Canada each agreed to reduce their emissions by 6 percent compared to the 1990 base year.

Since 2012 is almost here, it would seem logical that firms from countries that need to begin reductions of GHG emissions should have implemented plans to meet the goals of the Protocol. Furthermore, informing the stakeholders of these plans may enable them to make better comparative evaluation of the firm performance within a country and across countries. Though the Indian firms are not directly impacted by the first phase of the Protocol, they cannot ignore the problems that the Protocol is attempting to solve. Using renewable fuels, being more efficient, burning less fossil-fuels or at least those that produce less GHG emissions (e.g. natural gas instead of coal) are all ways that Indian firms can achieve lower GHG emissions. Reporting about these types of changes including their implications from both a financial and efficiency perspective would be in the interest of the stakeholders.

Firm Selection

Every year *Forbes* Magazine publishes a list of the 2000 largest firms in the world based on a combination of asset size and revenues. A sample of 299 firms comprised of 16 Indian firms, 149 EU firms (including 22 French, 26 German and 32 UK), 106 Japanese firms and 28 Canadian firms were selected from the following industries: airlines, capital goods, chemicals, conglomerate, consumer durables, energy, property and casualty insurance, materials (including steel), motor vehicles, oil and gas and utilities. Data concerning global warming on the companies included in the study by Jaggi and Freedman (2008) were obtained from a number of different sources, which include the Carbon Disclosure Project (2007), company's web site, social reports, annual reports, etc. The *Carbon Disclosure Project* (CDP) (2007) is organized by a non-profit organization that asks the companies impacted by global warming to complete a questionnaire annually (starting in 2001). Their questionnaire focused on how the company is affected by global warming or by the need to reduce its emissions of GHG. The CDP is trying to determine what the company's current situation is and what it plans to do about the problem in the future. In determining the current situation it asks for information about past and current GHG emissions. In terms of the future, it asks about plans to reduce emissions, to develop new products and its future expenditures. Corporate responses to the questions are a source of disclosure. Company websites provide another source of corporate disclosures concerning global warming. Available on the websites are usually the annual financial reports, social/environmental/sustainability reports, news, statements about the environment and other information. The websites provide another major source for disclosures.

Disclosure Index

A disclosure index was developed to facilitate the content-analysis of the reports. In the index, focus was on the categories of disclosure since the interest is on the extensiveness of the disclosure (content) as opposed to the raw amount (Jaggi and Freedman 2008). This approach has been utilized in numerous earlier environmental accounting studies (e.g. Wiseman 1982 and Patten 2000).

After examining all the appropriate CDP disclosures and information available on the websites it became quickly evident that many of the disclosure categories were being ignored by the companies. Furthermore, since the basis of the index is to provide some means of comparison between companies from different industries and operating in different countries an amended approach is developed (Jaggi and Freedman 2008).

The following categories are utilized for the index:

1. Mention or allude to global warming or the Kyoto Protocol

2. GHG (or carbon) emissions for 2005
3. Prior years GHG (or carbon) emissions
4. Statement with regard to what causes the company to produce emissions
5. Whether there is an outside firm doing an environmental audit
6. Amount of energy used in 2005
7. Specific plans to reduce GHG emissions
8. Future expenditures for reducing GHG

For EU companies:

9. Stating their carbon allocation for 2005 (or 2006)
10. Whether they need to buy/sell carbon credits

For Non-EU companies:

Anything about obtaining carbon credits

Study Results (Jaggi and Freedman 2008)

Disclosures by Indian firms compared to France, German, UK, Japanese and Canadian Firms

Pair-wise t-tests were used to evaluate pollution disclosures by Indian firms compared to French, German, UK, Japanese and Canadian firms. The t-test results indicate that pollution disclosures by Indian firms are significantly lower than firms from EU countries, Japan and Canada. The differences in the scores for Indian firms compared to firms from other countries are statistically significant in the pair-wise tests. Pollution disclosures are generally influenced by the size of the firm. Larger firms have the resources to collect and process data and they are also motivated to disclose more information because a larger number of investors are interested in their disclosures. Regression analysis was utilized to control for the impact of firm size on pollution disclosures and to examine whether pollution disclosures differ across sample countries. The results indicate that there is a significantly negative association between pollution disclosures and Indian and German firms (statistically significant at .01 level), whereas it is significantly positive for Japanese and Canadian firms, and insignificant for French and UK firms. Consistent with the t-test results, the regression results indicate that Indian firms are associated with comparatively lower disclosures than firms from Japan, Canada, and EU countries. These findings thus suggest that Indian firms are lagging behind the firms from other countries in making pollution disclosures on a voluntary basis.

Disclosures by industry group

The regression results on different industry groups show that the coefficients are statistically significant at the .01 level for chemicals and drugs, utilities, oil and gas and energy and materials. For capital goods and consumer durables there is a positive correlation at the .06 level. Companies from these industries make significantly greater disclosures concerning global warming compared to companies from other industries. The results thus show that there is a significantly positive association between pollution disclosures and firms from the pollution industry groups.

Disclosures of Carbon Emissions

Firms from countries other than India are making special disclosures of carbon dioxide emissions, but Indian firms do not make such disclosures. Only one firm, The Steel Authority of India, disclosed their carbon emissions for any of the study period. They provide data for total GHG emissions and for carbon emissions also for the 2002-2004 period.

Overall Disclosure

The mean of the pollution disclosure index for all firms in the sample is .438, and for the six groups of countries is as follows: France = .486, Germany = .281, UK = .347, Canada = .496, Japan = .555, and India = .153. These results show that overall disclosure of Indian firms is much smaller compared to the EU, Canadian and Japanese firms.

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Questions:

1. What was the objective of the Kyoto climate change conference? What is the purpose of Kyoto Protocol? What does it entail? What disclosures are required of participating countries? What is the timeline for disclosers?
2. Where does the US stand with climate change initiatives, what major issue needs to be addressed and what obstacles were raised at the Copenhagen climate change summit of 2009?
3. Was there an accord at the Cancun conference in 2010?
4. What is the concern of developing nations?
5. Are Indian firms making appropriate progress towards pollution disclosure?
6. What does the disclosure activity of Indian firms indicate to regulators and investors?

Teaching Notes

1. What was the objective of the Kyoto climate change conference? What is the purpose of Kyoto Protocol? What does it entail? What disclosures are required of participating countries? What is the timeline for disclosers?

The view that human activities are likely responsible for most of the observed increase in global mean temperature ("global warming") since the mid-20th century is an accurate reflection of current scientific thinking. Human-induced warming of the climate is expected to continue.

The objective is the "stabilization and reconstruction of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." (*The United Nations Framework Convention on Climate Change*, Retrieved 15 November 2005)

The objective of the Kyoto climate change conference was to establish a legally binding international agreement, whereby all the participating nations commit themselves to tackling the issue of global warming and greenhouse gas emissions. The target agreed upon was an average reduction of 5.2% from 1990 levels by the year 2012.

According to the treaty, in 2012, Annex I countries must have fulfilled their obligations of reduction of greenhouse gases emissions. The Protocol expires at the end of 2012.

The five principal concepts of the Kyoto Protocol are:

- Commitments to the Annex-countries. The heart of the Protocol lies in establishing commitments for the reduction of greenhouse gases that are legally binding for Annex I countries. Dividing the countries in different groups is one of the key concepts in making commitments possible, where only the Annex I countries in 1997, were seen as having the economic capacity to commit themselves and their industry. Making only the few nations in the Annex 1 group committed to the protocols limitations.
- Implementation. In order to meet the objectives of the Protocol, Annex I countries are required to prepare policies and measures for the reduction of greenhouse gases in their respective countries. In addition, they are required to increase the absorption of these gases and utilize all mechanisms available, such as joint implementation, the clean development mechanism and emissions trading, in order to be rewarded with credits that would allow more greenhouse gas emissions at home.
- Minimizing Impacts on Developing Countries by establishing an adaptation fund for climate change.
- Accounting, Reporting and Review in order to ensure the integrity of the Protocol.
- Compliance. Establishing a Compliance Committee to enforce compliance with the commitments under the Protocol.

The **Kyoto Protocol** is a set of international courtesy rules to the United Nations Framework Convention on Climate Change (UNFCCC or FCCC), aimed at fighting global warming. The UNFCCC is an international environmental treaty with the goal of achieving "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." The Protocol was initially adopted on 11 December 1997 in Kyoto, Japan and entered into force on 16 February 2005. As of September 2011, 191 states have signed and ratified the protocol. The only remaining signatory not to have ratified the protocol is the United States. Other states yet to ratify Kyoto include Afghanistan, Andorra and South Sudan.

Under the Protocol, 37 countries ("Annex I countries") commit themselves to a reduction of four greenhouse gases (GHG) (carbon dioxide, methane, nitrous oxide, sulphur hexafluoride) and two groups of gases (hydro fluorocarbons and perfluorocarbons) produced by them, and all member countries give general commitments. Annex I countries agreed to reduce their collective greenhouse gas emissions by 5.2% from the 1990 level.

The Protocol allows for several "flexible mechanisms", such as emissions trading, the clean development mechanism (CDM) and joint implementation to allow Annex I countries to meet their GHG emission limitations by purchasing GHG emission reductions credits from elsewhere, through financial exchanges, projects that reduce emissions in non-Annex I countries, from other Annex I countries, or from annex I countries with excess allowances.

Each Annex I country is required to submit an annual report of inventories of all anthropogenic greenhouse gas emissions from sources and removals from sinks under UNFCCC and the Kyoto Protocol. These countries nominate a person (called a "designated national authority") to create and manage its greenhouse gas inventory. Virtually all of the non-Annex I countries have also established a designated national authority to manage its Kyoto obligations, specifically the "CDM process" that determines which GHG projects they wish to propose for accreditation by the CDM Executive Board.

2. Where does the US stand with climate change initiatives, what major issue needs to be addressed and what obstacles were raised at the Copenhagen climate change summit of 2009?

COP15 is the official name of the Copenhagen climate change summit — the 15th Conference of the Parties (COP) under the United Nations Framework Convention on Climate Change (UNFCCC). The COP is the highest body of the UNFCCC and consists of environment ministers who meet once a year to discuss developments in the convention.

One hundred and ninety-two countries have signed the climate change convention. More than 15,000 officials, advisers, diplomats, campaigners and journalists attended, joined by heads of state and government.

It is held by many of the developing counting, including China and India that it is the responsibility of wealthy industrialized nations such as the UK and US to set a clear example on cutting carbon emissions.

However, the US rejected the 1997 Kyoto protocol, with George Bush arguing that the 5% reductions required by Kyoto would "wreck [the American] economy" while making no demands on emerging economies. COP15's chances of success have been improved by President Barack Obama's stated intention to achieve an 80% reduction of greenhouse gas emissions by 2050. In April, the secretary of state, Hillary Clinton, acknowledged the role the US had played in past climate emissions at a gathering of officials from the world's 17 largest economies. She said the US was "determined to make up for lost time both at home and abroad". "The US is no longer absent without leave," she said. However, Denmark's minister for climate and energy, Connie Hedegaard, has warned that American leadership on climate change will be undermined if the Obama administration does not pass laws swiftly to reduce carbon pollution.

The major issue is that of "burden-sharing". Climate scientists say that the world must stop the growth in greenhouse gas emissions and start making them fall from around 2015 to 2020. By 2050 they estimate the world must cut its emissions by 80% compared with 1990 levels to limit global warming to a 2C average rise. But which countries must make the cuts and by how large should they be? For example, the rapidly growing Chinese economy has recently overtaken America as the world's largest emitter of carbon dioxide. Yet America has historically emitted far more emissions than China, and on a per capita basis Chinese emissions are around a quarter of those of the US.

The Chinese government argues that it has a moral right to develop and grow its economy — carbon emissions will inevitably grow with it. There is also the issue of industrialized nations effectively outsourcing carbon emissions to developing nations such as China. This is a consequence of huge quantities of carbon-intensive manufacturing taking place in China on behalf of buyers in the west. It wants consumer countries to take responsibility for the carbon emissions generated in the manufacture of goods, not the producer countries that export them. Problems such as these have cast doubts on whether COP15 can succeed. Concerns were expressed about whether any action we take now to prevent climate change may be too little too late.

3. Was there an accord at the Cancun conference in 2010?

Countries cannot agree on extending the Kyoto Protocol past the close of its first commitment period at the end of 2012. The United States, which never ratified the protocol, will not approve any treaty unless major economies such as China and India are also covered. China has resisted any legally-binding treaty but appears ready to allow verification of its greenhouse gas emissions. Russia, which is legally bound by the Kyoto Protocol, now opposes its extension. "Russia will not participate in the second commitment period of the Kyoto Protocol," Russia's climate change negotiator Alexander Bedritsky, a former president of the World Meteorological Organization, told Cancun delegates Thursday. Japan, which is now covered by the protocol, said last week it will not agree to a second commitment period unless the United States and China sign on to the treaty. Japanese Foreign Ministry envoy Akira Yamada is insisting on a "single, legally binding agreement." Canada, also covered by the protocol, abandoned its commitment years ago.

As governments abandon the Kyoto Protocol, negotiators in Cancun have focused on less controversial goals - protection for carbon-absorbent forests and their indigenous inhabitants, a fund to help developing countries cope with climate impacts, and clean-energy technology sharing. But developing countries are clinging to the protocol as their only insurance against the devastating impacts of global warming - melting glaciers, drought, floods, sea level rise, disease migration and species extinctions. However, the ultimate goal is clear to everyone on the final day of the UN climate talks in Cancun - a single legally-binding agreement to limit global warming that includes all countries - the biggest greenhouse gas emitters, China and the United States, the 37 now bound by the Kyoto Protocol, and the vulnerable developing countries.

4. What is the concern of developing nations?

Bolivian President Evo Morales stressed the need to extend the Kyoto Protocol to ensure protection for Mother Earth. He stated, "Our aim here is to look at how to cool down planet Earth. Our planet has a high temperature, it is wounded, and we are witnessing the convulsions of planet Earth," said Morales. "We have an enormous responsibility toward life and humanity. If, from here, we send the Kyoto Protocol to the rubbish bin we are responsible for ecocide and genocide because we will be sending many people to their deaths," Morales warned. The BASIC nations including China, Brazil, India and South Africa said that they would not support a deal until a second commitment period for the Kyoto Protocol is agreed, a fast-track climate change fund is established and a basic agreement is reached on technology transfer.

One of the most contentious issues is measurement, reporting and verification / international consultation and analysis. India is proposing that all countries contributing more than one percent of global greenhouse gases should report their status and actions to reduce emissions to the United Nations every three years. Others can report their actions every six years. Actions of developing countries would be voluntary and failure to meet any domestic target would carry no consequences, the proposal says.

5. Are Indian firms making appropriate progress towards pollution disclosure?

All firms impacted by the Kyoto Protocol are expected to provide their stakeholders with information on their pollution performance. Even though Indian firms are not currently impacted by the first implementation phase of the Protocol, they are expected to disclose pollution information to enable the stakeholder, especially investors, for making comparative evaluation of firm performance. Despite the fact that Indian firms have time to plan for reduction in carbon emissions to meet international requirements for pollution control, investors, especially international investors, are interested to know whether Indian firms are doing their fair share in controlling pollution and whether they can get pollution information from disclosures made by Indian firms.

Indian firms are not making significant pollution disclosures; their disclosures are significantly lower compared to other countries. The weakness in pollution disclosures leaves investors to guess whether Indian firms are involved in pollution reduction, and how they would perform competitively in the international business environment. Unless Indian firms improve on their pollution disclosures on a voluntary basis, the regulatory agencies shall consider the mandatory requirement for such disclosures to force Indian firms to do their fair share in controlling global pollution and also prepare themselves for pollution reduction in the later phases of international agreements on pollution emission reduction. Pollution disclosures are assuming even greater importance as a result of the Carbon Trading System, which is in place in the European countries, and is being considered by several other countries outside Europe. With globalization of the Carbon Trading System, India will also have to evaluate introduction of this system, and pollution disclosures play an important role in developing such a system.

6. What does the disclosure activity of Indian firms indicate to regulators and investors?

Based upon the inadequate disclosures by Indian firms, regulators need to evaluate whether there is a need for regulatory disclosure requirements to ensure the availability of minimum essential pollution information to the stakeholders, especially investors. The need for disclosure regulations will especially deserve careful consideration when Indian firms will be required to meet international pollution reduction standards in the later phases of global initiatives to reduce pollution emissions, especially of greenhouse gases.

Investors would be interested to know whether Indian firms are preparing themselves for these requirements by disclosing pollution information on a voluntary basis. Moreover, as a result of greater awareness of the pollution problem, investors in India are likely to be more concerned with cleaner environment and firms' contributions to maintain the environment clean. The stock market needs for pollution disclosures would assume even greater importance in a developing nation such as India because of economic growth and globalization of the country's stock markets. International investors will need this information for comparative evaluation of the firm's pollution performance across countries.