

The Kyoto Protocol : Toothless and Obsolete

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The international concern over the climatic changes has provoked industrialized nations to reduce the emission of Green House Gases (GHG's) by an overall 5 per cent, as compared to 1990 level by 2008-2012. The present study analyses the emission mitigation targets under Kyoto Protocol by industrialized nations classified as the Annex I parties. The Annex I parties (EIT and Non-EIT) are able to reduce the emissions by 6 per cent, which is mainly due to the collapse of former USSR economy, in 2003 as compared to 1990 level. The EIT parties have registered a 40 per cent decline in the GHG's emissions. On the other hand, the emissions from Non-EIT parties have increased by 9 per cent in the same period. These industrialized nations are now well off the targets and are expected to emit 10 per cent above the 1990 level by 2010. The treaty seems to be toothless and obsolete without the support of the USA, the country responsible for 1/4th of the world emission, and fatally flawed because it does not require developing countries to commit emission reductions.

1. INTRODUCTION

Global warming is a growing concern all over the world. The temperature of earth has increased by 0.6°C in the 20th century and it may increase by 1.5-3.5°C in the next 100 years if it continues at this rate. Scientists agree unanimously that this warming is largely due to emission of carbon dioxide and other gases responsible for greenhouse effect. Human activities such as industrial process, fossil fuel combustion, and deforestation etc. are responsible for accumulation of these gases. The atmospheric concentration of Green House Gases (GHG's) has increased due to the developmental process of nations. The concentration of CO₂, CH₄ and N₂O has increased by 34%, 153% and 17% respectively as compared to pre-industrial level. During Earth Summit (1992) at Rio-De Janeiro, countries all over the world have agreed to reduce GHG's to 1990 level to avoid dangerous consequences of climatic changes, and signed their commitments in Framework Convention on Climatic Change (FCCC).

The Kyoto protocol was signed in 1997 in Kyoto, Japan, where industrialized nations committed themselves to mitigate overall GHG's¹ emission by 5.2 per cent by 2008-2012 compared to 1990 base year. The protocol based on Polluters pays principle enshrined in FCCC, establishes three innovative mechanisms, CDM, JI and IET, specifically designed to help Annex I countries to reduce the cost of

meeting their targets and to build adaptive capacity of poorer nations. Under the protocol, nations were assigned their quotas to increase or decrease their emissions, and are allowed to sell their quotas of GHG's (provided they emit less), to the polluting nations.

The paper continues as follows. The mechanism of Kyoto Protocol will be discussed in section 2, while section 3 correlates economic development and GHG emission. Section 4 highlights the emission targets achievements and the concerning issues. Some concluding remarks are made in section 5.

2. MECHANISM OF KYOTO PROTOCOL

The international concern over the environment has grown in an unprecedented way at economic, political, social and scientific levels. This, in turn, forced developed nations to commit emission reduction and sign Kyoto Protocol. Under the protocol, the nations are classified as Annex I and Non-Annex I. The Annex I countries are further categorized into EIT (Economies in Transition) and Non-EIT. The protocol based on the principles of FCCC has the following objectives:

1. To protect the environment on the basis of equity and in accordance with differentiated responsibilities where the Annex I countries should lead.
2. Specific needs of Non-Annex I countries are taken into consideration.
3. Parties should address all sources, sinks, adaptation and all economic sectors.

Annex I countries must provide information how they are striving to meet their emission reduction targets while minimizing the adverse impact on developing countries, such as reducing subsidies, associated with environmentally unfriendly technologies and technological development of non-energy uses of fossil fuel. Under the protocol, Annex I parties can reduce emission domestically or by trading emission or by investing in other countries. These possibilities are called Kyoto Mechanisms, which are as under:

- Joint Implementation: Under JI mechanism an Annex I party may implement projects that reduce emission or increase removal by sinks in the territory of another EIT party and counts resulting emission targets against its own target.
- Clean Development Mechanism: Under CDM, Annex I party may implement projects in Non-annex I party that reduce emission and use the resulting certified emission reduction (CER's²) to help meet their own targets. The CDM mechanism also helps Annex I countries to achieve sustainable development and finally contributes to the ultimate objectives of the convention.
- International Emission Trading: In IET, an Annex I party may transfer some of the emissions under its assigned amount to another Annex I party that finds it relatively more difficult to meet its emission target. It may also transfer CER's and ERU's that it has acquired through CDM, JI or sink enhancement activities in the same way.

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Apart from these three mechanisms under the Protocol, the European Union (EU) countries are also enjoying another mechanism “**Bubble**” and will redistribute their targets among themselves.

To participate in the mechanism, Annex I parties must meet the following eligibility requirements:

- Ø They must have ratified the Protocol.
- Ø They must have calculated their assigned amount.
- Ø They must have put in place a national system for estimating emission and removal of GHG's within their territory.
- Ø They must have put in place a national registry to record and track the creation and movement of ERU's, CER's, AAU's, and RMU's³ and must annually report such information to the secretariat
- Ø They must annually report information on emissions and removals to the secretariat.

The Annex I parties may offset their emissions by increasing the amount of GHG's removal from atmosphere by the so called carbon “sinks” in land-use, land-use change and forestry sector (LULUCF⁴). However, afforestation, reforestation and forest management, grazing land management and revegetation are also eligible under it. Any GHG's emission from eligible activities, in turn, may be offset by greater emissions removal elsewhere. The protocol became a legal binding treaty on February 16, 2005. It could come into force only after fulfilling the following conditions:

- o It had been ratified by at least 55 per cent countries; and
- o It had been ratified by nations accounting for at least 55 per cent of the emissions from Annex I parties excluding Belarus, Turkey and Kazakhstan.

3. DEVELOPMENT AND EMISSION

As stated earlier, the emissions of GHG's have increased manifold, due to the multiplicity of human development activities, since the industrial revolution being initiated. Higher levels of economic activities require more inputs of energy and raw materials, which generate more quality of waste by-product. Increase in exploitation of natural resources, accumulation of waste and concentration of pollutants lead to degradation of environment quality and threat to human life. As highlighted by World Bank Report, high-income economies⁵ accounted for only 15 per cent of the world's population. Their share in world's carbon emissions is estimated to be almost 50 per cent. A positive association is found between income and CO₂ emission. Per capita carbon dioxide is more than 12 times in high-income economies as compared to low-income economies. So the high-income economies are contributing more to the degradation of our common environment.

The GDP of Annex I parties taken together have increased by 28 per cent while their emissions have declined by 6 per cent (from 18.4 billion CO₂-e⁶ to 17.3 billion CO₂-e) in 2003 as compared to 1990 (Table 1). On the other hand, the GDP of EIT- Annex I has declined by 10 per cent along with a 40 per cent (from 5.7 billion CO₂-e to 3.4 billion CO₂-e) decline in GHG's emission for the same period (Table 2). Interestingly, the population in these economies has also declined by 4 per cent during the same period. On the contrary, the GDP of Non-EIT Annex I parties have increased by 24 per cent along with a 9 per cent (12.7 billion CO₂-e to 13.9 billion CO₂-e) increase in the emission of GHG's in the aforesaid period (Table 3). So a distinct trend has emerged in EIT and Non-EIT parties of Annex I. There exists a negative association between GDP, GHG's and population in EIT parties while the same happen to be positive in Non-EIT parties.

4. EMISSION TARGETS AND PROJECTIONS

Under the protocol each Annex I country agreed to its own specific emission reduction targets (Table 4 & 5). Some countries with low emission were permitted to increase the same. The maximum amount of emission (measured as the equivalent in carbon dioxide) that a party may emit over the commitment period in order to comply with its emission targets is known as a party's assigned amount. The protocol includes provisions for the review of its commitments, so that these can be strengthened in future. Negotiations on targets for the second commitment period have started in 2005 by which time the Annex I parties must have made remarkable progress in meeting the targets. To achieve targets, Annex I parties were required to put in place domestic policies and measures.

The Table 4 indicates that only two countries (U.K. and Germany), from Non-EIT Annex I list, have fulfilled their commitment of emission reduction under Kyoto Protocol by 2003. Iceland and Norway have shown a decline in their emissions in spite of the fact that they were allowed to increase their emission under the treaty. The big emitter, U.S.A., which didn't ratify the treaty, has increased its emission three times more instead of reducing it as per the commitment of the convention. Similarly, Japan, Spain, Portugal, Ireland, Finland, have followed the way of the Big Emitter. The European Community is just halfway to meet its targets. Rest of the parties are still not on the right track to meet their commitment under the protocol.

The Table 5 reveals a reverse trend, where all the EIT parties enlisted in Annex I of the protocol have reduced their emissions considerably. Countries like Romania, Russian Federation, Ukraine, Lithuania, Latvia, Belarus, Bulgaria, Estonia, have been able to reduce the emissions of GHG's almost 50 per cent since 1990 to 2003. The share of EIT parties in the total emission of Annex I parties has declined from 30.9 per cent to 19.9 per cent since 1990. There are wide variations of emissions change since 1990 to 2003 among Annex I parties, e.g., Lithuania (-77.5 per cent) and Canada (57.5 per cent). Table 6 reveals that energy sector is responsible for the largest share of GHG's emission from Annex I parties, i.e., 84.4 per cent in 2003. The largest increase is observed in transport sector (20.7 per cent),

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whereas the largest decrease was registered in agriculture sector (15.7 per cent).

THE ISSUES

The protocol sets emission targets to 2012 only, what happens after that and to those which remain to be agreed? The future of the protocol is largely in the hands of the world's biggest contributors to the greenhouse gas emissions. The treaty seems to be flawed on another count also because it does not include the developing countries to commit any emission reduction. The big South Asian emitters- China and India are not required any emission reduction commitment. The Kyoto regime has no future until USA accepts it. The abundance of cheap coal will make it economically impossible to comply with the envisaged stipulations, and, as such, mitigate the GHG's emissions cost effectively. Moreover, the questions can be raised with regard to the environmental effectiveness of the protocol itself. Even if 5 per cent emission reduction for industrialized nations were achieved, this would only have a marginal attenuating effect on the anticipated temperature rise. Real reductions will be lower than the already very modest nominal reductions, because of the accounting of sinks as emissions reduction. And some countries have also been allocated emissions right above their business-as-usual projections. Moreover, the withdrawal of USA from the treaty leads to a low incentive to mitigate the emissions for rest of the parties.

5. CONCLUDING REMARKS

The Annex I parties haven't shown any remarkable progress yet, they are just able to cut their overall emission by 6 per cent from 1990 to 2003, but this was largely due to sharp decrease in the emission from the collapse of former USSR economy. The emissions from Non-EIT parties have rather increased by 9 per cent. The industrialized nations are now well off targets and are expected to emit 10 per cent above the 1990 level by 2010. In spite of some clear areas of environmental success by few industrialized countries, a majority of environmental factors appear to have become worsened by the industrialized process, despite technological advances of the North. The international hope rests on the ability of industrial growth to mitigate the emissions and to improve environmental quality for the poor and improvised people of the South.

The protocol can be more effective if responsibility of each party could be defined directly and strictly in relation to the contribution in GHG's. Countries avoiding or not following their emission reduction targets should be punished or fined financially. Further, equal quota of GHG emissions should be allocated to very person on the earth. Countries having high value for CO₂/GDP would have more potential to mitigate it. These countries can therefore be allocated larger quotas accordingly. There should be tighter limits on emission to avoid dangerous consequences of climatic changes. Therefore a hedging strategy is needed to reduce the emission below 1990 level. In our opinion, it can be made possible only by straight 50 per cent reduction in global CO₂ emission by 2050.

Notes

1. The targets cover emissions of the six main greenhouse gases, namely: Carbon dioxide (CO_2); Methane (CH_4); Nitrous Oxide (N_2O); Hydrofluorocarbons (**HFCs**); Perfluorocarbons (**PFCs**); and Sulphur Hexafluoride (SF_6).
2. **CER** (Certified Emission Reductions) is the credit issued for emission reductions by a project under the CDM, which can be used by an Annex I party to help meet its emissions mitigation commitment under the treaty. Each CER equals 1 metric tonne of CO_2 equivalent.
3. **RMUs** (Removal Units): The credits issued for net sink enhancements by eligible activities under the protocol by an Annex I party. RMUs can be used by an Annex I party to help meet its emissions mitigation commitment under the treaty. Each RMU equals 1 metric tonne of CO_2 equivalent.
4. Land-use-changes: It will lead to emission, such as deforestation, as well as uptake of carbon dioxide, such as afforestation.
5. World economies are classified according to the World Bank estimates of 1999 GNI per capita, e.g., Low income (\$755 or less), Lower Medium (\$756-2995), Upper Medium (\$2996-9265) and High Income (\$9266 or more).
6. $\text{CO}_2\text{-e}$ (carbon dioxide equivalent): A unit that expresses the radiative forcing of a mass of a given GHG in terms of a mass carbon dioxide with equivalent radiative forcing.

References

1. Panoyotou T, "Economic Growth and Environment", CID working paper No. 56, July 2000, Center for International Development, Harvard University.
2. Cleveland, Hall and Kaufman, "Energy and the US Economy", A biophysical perspective, *Science* 225,1984.
3. Grossman and Krueger, "Economic Growth and Environment", *Quarterly Journal of Economics*, 110,1995.
4. European Environmental Agency, May 2005, DIC 1050, Copenhagen.
5. Michaelowa A and Butzenegger S, "Looking Beyond 2012", *Environmental Finance*,5, 2003.
6. IPCC, "Workshop on New Emission Scenario", Laxenberg, Austria, June 2005 and "Climatic Change 2001 : Working Group III: Mitigation".
7. Richard Black, "Cheers, Yet Concern for Climate", BBC News, Dec.2005 and February 2006.

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8. Hall, M.Y, “Responding to Climatic Change”, 10th conference of parties, Argentina, December, 2004.
9. World Development Indicators 2002, The World Bank, Washington D.C.
10. WBGU, “ Climatic Protection Strategies for the 21st Century; Kyoto and Beyond”, 2003 Berlin.
11. Development and Environment, Page No. 40, World Development Report 1992, The World Bank.
12. UNFCCC, “KEY GHG DATA”, 2003, Bonn, Germany.

Table: 1 Indicators of Annex 1 Parties

Indicators	1990	2003	% Change
Population (Millions)	11184	11754	5.1
GDP (Billions)	21868	27964	27.9
GDP per capita (000 \$)	19.6	23.8	21.7
CO2 emissions (Metric tons)	14721	14289	-2.9
Co2 per capita (Metric tons)	13.2	12.2	-7.6
Co2/GDP (Kg. Per \$)	0.67	0.51	-24.1
GHG emissions (Metric tons CO ₂ -e)	18372	17288	-5.9
GHG per capita (Metric tons CO ₂ -e)	16.4	14.7	-10.5
GHG/GDP (kg equivalent per \$)	0.84	0.62	26.4

Source: UNFCCC, "KEY GHG DATA", 2003

Table: 2 Indicators of EIT Annex 1 Parties

Indicators	1990	2003	% Change
Population (Millions)	321.1	308.7	-3.9
GDP (Billions)	2998	2702	-9.9
GDP per capita (000 \$)	9.3	8.8	-6.2
CO2 emissions (Metric tons)	4405	2656	-39.7
Co2 per capita (Metric tons)	13.7	8.6	-31.3
Co2/GDP (Kg. Per \$)	1.47	0.98	-33.1
GHG emissions (Metric tons CO ₂ -e)	5681	3433	-39.6
GHG per capita (Metric tons CO ₂ -e)	17.7	11.1	-37.1
GHG/GDP (kg equivalent per \$)	1.89	1.27	-32.9

Source: UNFCCC, "KEY GHG DATA", 2003

Table: 3 Indicators of Non-EIT Annex 1 Parties

Indicators	1990	2003	% Change
Population (Millions)	797.3	866.7	8.7
GDP (Billions)	18870	252.62	33.9
GDP per capita (000 \$)	23.7	29.1	23.2
CO2 emissions (Metric tons)	10316	11633	12.8
Co2 per capita (Metric tons)	12.9	13.4	37
Co2/GDP (Kg. Per \$)	0.55	0.46	-15.8
GHG emissions (Metric tons CO ₂ -e)	12691	13855	9.2
GHG per capita (Metric tons CO ₂ -e)	15.9	16	0.4
GHG/GDP (kg equivalent per \$)	0.67	0.55	-18.5

Source: UNFCCC, "KEY GHG DATA", 2003

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Table: 4 Annex 1 NON-EIT Parties: Emission Targets and Achievements

Countries	GHG Emissions in 1990	GHG Emissions in 2003	Per cent change from 1990 to 2003	Emissions targets under Kyoto protocol in Percent
Australia	524.54	550.08	4.9	8
Austria	69.56	78.79	13.3	-8
Belgium	142.56	144.19	1.1	-8
Canada	442.03	696.26	57.5	-6
Denmark	70.86	74.28	4.8	-8
Finland	47.67	67.78	42.2	-8
France	534.84	504.6	-5.7	-8
Germany	1214.75	981.82	-19.2	-8
Greece	106.22	132.11	24.4	-8
Iceland	3.27	2.8	-14.3	10
Ireland	53.39	66.57	24.7	-8
Italy	450.49	487.93	8.3	-8
Japan	1103.4	1339.13	21.4	-6
Liechtenstein	0.25	0.26	5.3	-8
Luxemburg	13.15	11	6.3	-8
Monaco	0.096	0.13	37.8	0
Netherlands	214.6	217.58	1.4	-8
Newzeland	40.15	52.48	30.7	0
Norway	36.71	33.84	-7.8	1
Portugal	65.43	88.23	34.8	-8
Spain	274.82	362.17	31.8	-8
Sweden	51.92	49.06	-5.5	-8
Switzerland	51.17	50.47	-1.4	-8
UK	750.64	649.57	-13.5	-8
U S A	5046.06	6072.18	20.3	-7
European Community	4014.58	3872.96	-3.5	-8

Source: UNFCCC, "KEY GHG DATA", 2003

Table: 5 Annex 1 EIT parties: Emission Targets and Achievements

Countries	GHG Emissions in 1990	GHG Emissions in 2003	Per cent change from 1990 to 2003	Emissions targets under Kyoto protocol in Percent
Belarus	112.5	55.64	-50.5	-
Bulgaria	136.24	62.11	-53.4	-8
Croatia	19.08	14.49	-24	-
Czech Republic	189.89	141.64	-25.4	-8
Estonia	37.17	12.67	-65.9	-8
Hungary	120.88	79.28	-34.4	-6
Latvia	6.96	2.34	-66.4	-8
Lithuania	45.45	10.21	-77.5	-8
Poland	529.67	319.54	-39.7	-6
Romania	249.41	126.02	-49.5	-8
Russian federation	3204.95	1664.26	-48.1	0
Slovakia	69.70	46.89	-32.7	-8
Slovenia	17.23	14.24	-17.4	-8
Ukraine	939.96	471.31	-49.9	0

Source: UNFCCC, "KEY GHG DATA", 2003

Table: 6 Sectoral GHG's Emissions 1990-2003 GHG total by sectors

(1000 billion CO₂-e)

Sectors	NON-EIT	EIT	Annex I
LULUCF	12.1	9152	-17.4
OTHERS	14.5	-	14.5
WASTE	-15.3	-18.9	-14.3
AGRICULTURE	-15.7	-52.1	-2.6
SOLVENT & OTHER PRODUCTS	-7.1	-38.9	-3
INDUSTRIAL PROCESS	-9.6	-26.4	-4
TRANSPORT	20.7	-14.1	22.3
ENERGY (WITHOUT TRANSPORT)	-1.1	-41.9	8.9
Energy (with transport)	-4.2	-39.4	12.4

Source: UNFCCC, "KEY GHG DATA", 2003