universität wien

DISSERTATION

Titel der Dissertation

"Sustainable Development and Climate Change Policies: Situation of Turkey as an Accessing Country to the EU"

Verfasserin

Hande Baloğlu

angestrebter akademischer Grad

Doktor der Philosophie (Dr. phil.)

Wien, Oktober 2009

Studienkennzahl lt. Studienblatt:	A 092 300
Dissertationsgebiet lt. Studienblatt:	Politikwissenschaft
Betreuerin / Betreuer:	Univ. Prof. Dr. Othmar Höll

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I was born in 1981 in Ankara. I graduated from Marmara University, Istanbul, Department of Political Science and International Relations in 2003. I had Master of Advanced International Studies (MAIS) of Vienna University and Diplomatic Academy of Vienna in 2005. Currently I am working in Turkish Industrialists' and Businessmen's Association (TUSIAD). I have been a student of Doctorate of Political Science in Vienna University since 2007.

ZUSAMMENFASSUNG

Seit den letzten Jahrzehnten hat man die Auswirkung der klimatischen Veränderung in Abhängigkeit zum Menschenbeeinflussung, in globalen und regionalen Massstab beobachtet. Die zunehmende Auswirkung der klimatischen Veränderung ist im 21. Jahrhundert das begegnete grösste komplexe Problem. In diesem Fall hat sich die internationale Gemeinschaft im weiterführenden Entwicklungsrahmen auf die klimatische Veränderung konzentriert. Ab Anfang der Jahre 1980, ist der internationale klimatische Veränderungspolitik, die unter dem Dach der vereinten Nationen durchgeführt werden, im Jahre 1994, mit dem Abschluss des UN Rahmenvertrages (UNFCCC) über die klimatische Veränderung und im Jahre 2005, mit Inkraftretung des Kyoto-Protokolls vorwärts gekommen. Diese These, die sich auf die weiterführende Entwicklung und klimatische Veränderung bezieht, untersucht bei der Erforschung der historischen Zeit und Entwicklung der internationalen Zusammenarbeit, in diesem Themenbereich die Position der Türkei, der sich im Mitwirkungsverlauf zur EU befindet. Während die These die klimatische Veränderungspolitik international, von AB und der Türkei, in drei Schritten untersucht, berücksichtigt es auch die eventuellen Entwicklungen im neuen klimatischen Regime, welche nach dem Jahre 2012 (post-2012). Aber die neue klimatische Veränderungsregime und dessen Auswirkungen, ab dem Jahre 2012, sollte die Sache der zukünftigen Forscher und Forschungen sein.

Die klimatische Veränderung, die eine wichtige klimatische Gefahr bildet, sollte mit Hilfe der weiterführenden Entwicklungsvorstellung und mit einer globalen Vorgehensweise in die Hand genommen werden. Aus diesem Grund ist für einen langfristigen Erfolg eine nationale und internationale multi-disziplinäre Vorgehensweise sehr wichtig. In diesem Rahmen hofft die internationale Gemeinschaft, in der Versammlung, die im Dezember 2009 in Kopenhag stattfinden wird, hinsichtlich der neuen globalen klimatischen Veränderung eine politische Entscheidung zu treffen. Es wird erwartet, dass eine Vereinbarung, die im Jahre 2012 inkraft treten soll und die Massnahmen und Vorrichtungen hinsichtlich der rechtliche Abhängigkeit dieser politischen Entscheidung und dem Zweck, der auf die Reduzierung der Emission orientiert ist, abgeschlossen wird. Besonders nachdem die USA von der Kyoto-Protokoll ausgetreten ist, hat die EU die Führung der globalen klimatischen Veränderungspolitik übernommen und setzt seine Aufgabe in diese Rolle heute noch fort. Aber die EU behauptet, dass die grossen Beschaediger, besonders die USA, China und die Entwicklungsländer wie

Indien, in der neuen klimatischen Regime, nach dem Jahre 2012, eine aktive Rolle spielen sollten und die Verantwortung dafür übernehmen sollten.

Ausserdem setzt die EU für die zukünftige Periode, abspruchsvolle Emissionreduzierungsziele ab und bildet eine integrierte klimatische Energiepolitik. In diesem Fall wird die Türkei für die klimatische Regime ab dem Jahre 2012, hinsichtlich Verantwortung aufnahmen und Zielsetzung, sowohl unter Druck der EU als auch der internationalen Gemeinschaft stehen.

Da sowohl die Entwicklungs- und die wirtschaftlichen Zweifeln als auch die UNFCCC in der Landverpflichtungsliste falsch positioniert sind, ist die Türkei seit längeren Jahren als eine passive Spieler der globalen klimatischen Veränderungsregime geblieben. Die Türkei ist im Jahre 2009 zum Partner der Kyoto-Protokoll geworden, aber da die erste Verpflichtungsperiode schon im Jahre 2008 angefangen hat, konnte sie keine Verantwortung übernehmen. Wie die anderen Entwicklungsländer, denkt auch die Türkei, dass zwischen dem wirtschaftlichen und industriellen Entwicklung und dem Umweltschutz eine Unstimmigkeit ist. Aber als ein Mitglied der OECD und ein Land, der sich im Beteiligungsverlauf zum EU befindet, sollte die Türkei ab dem Jahre 2012, in den globalen klimatischen Verhandlungen eine aktive Rolle übernehmen und mit Einschränkung seiner schnell zunehmende Emissionen im Rahmen der weiterführenden Entwicklungsziele, seine Strategien vorbereiten.

ABSTRACT

Consequences of human-induced changes in climate have been observed in global and local levels in the last decades. The increasing effects of climate change have been one of the complex challenges of the 21st century. International community focuses on the climate change issue in the framework of sustainable development. In the early 1980s, the first common action plans were formalized under the umbrella of the UN, which resulted in entrance into force of the UN Framework Convention on Climate Change in 1994 and the Kyoto Protocol in 2005. This thesis examines the development of international cooperation on global climate change and sustainable development and traces the evolution of the global climate change regime within a historical perspective and tries to understand the position of Turkey as an accessing country to the EU. In this respect, this thesis examines developments in climate policies at international and the EU level as well as at national level of Turkey until present time while attempting to foresee the possible future developments in the post-2012 period. In this framework, the forthcoming climate regime of post-2012 and its implications should be followed and examined further by the next researchers.

Climate change is a serious global threat that must be addressed through concentrated global action with a vision of sustainable development. Long-term success requires national and international multi-disciplinary efforts by all countries. In this framework, international community expects to reach a political decision in global climate regime in December 2009 in Copenhagen that will be followed by a legally binging treaty, containing emissions reduction targets, measures and mechanisms, entering into force by 2012. In the global climate regime, the European Union has been a leading actor, particularly after the withdrawal of the US from the Kyoto Protocol. Nevertheless, for the post-2012 global climate regime, the EU is willing to involve all the big emitters, particularly the US, and also the developing countries, such as China and India. Meanwhile, the EU sets ambitious emission reduction targets accompanied with integrated climate and energy policy. In this respect, Turkey is pressured by the EU and the international community to take commitments in the post-2012 climate regime.

Due to development and economic constraints as well as misplacement in the country commitment lists of the UNFCCC, Turkey has been a passive actor during the development of global climate regime. Indeed, Turkey ratified the Kyoto Protocol recently in 2009, without having any emission target, since the first commitment period of Kyoto has already started in

2008. As in other developing countries, Turkey felt a trade-off between clean environment and economic-industrial development. Nevertheless, as an OECD member and an accessing country to the EU, Turkey should take an active role in ongoing post-2012 climate negotiations and set strategies in order to limit its rapidly growing emissions in line with sustainable development goals.

ACKNOWLEDGEMENTS

I would like to thank to Prof. Dr. Othmar Höll and Prof. Dr. Peter Gerlich for their support and assistance to this thesis. I express my deepest gratitude to my parents and my sister for their endless patience, encouragement and supports. Moreover, I would like to thank all my friends and those who have contributed to the preparation of this thesis.

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ABBREVIATIONS

AOSIS	Alliances of Small Island States
AWG	Ad Hoc Working Group
BAU	Business-as-usual
CBCC	Coordination Board on Climate Change
CBD	Convention on Biological Diversity
CC	Candidate Country
CDM	Clean Development Mechanism
CER	Certified Emissions Reduction
CFCs	Chlorofluorocarbons
CH_4	Methane
CO_2	Carbon dioxide
COP	Conference of the Parties
DPT	Devlet Planlama Teskilatı
EAP	Environmental Action Programme
ECCP	European Climate Change Programme
EEA	European Energy Agency
EIG	Environmental Integrity Group
EIT	Economies in Transition
EKC	Environmental Kuznets Curve
ENRTP	Environment and Natural Resources Thematic Programme
ERU	Emissions Reduction Unit
ETS	Emissions Trading Scheme
EU	European Union
FAO	United Nations Food and Agriculture Agency
FYDP	Five Year Development Plans
GCCA	Global Climate Change Alliance
GDP	Gross Domestic Product
GEF	Global Environment Fund
GEREF	Global Energy Efficiency and Renewable Energy Fund
GHG	Greenhouse gas
GWP	Global Warming Potential
HFC	Hydroflourocarbon
IEA	International Energy Agency
INC	Intergovernmental Negotiating Committee
IOs	International Organizations
IPCC	Intergovernmental Panel on Climate Change
IPRs	Intellectual Property Rights
JI	Joint Implementation
LDC	Less developed country
LIFE	EU's financial instrument supporting environmental and nature conservation projects
LUCF	Land-use change and forestry
LULUCF	Land use, land-use change and forestry
MoEF	Ministry of Environment and Forestry
MOP	Meeting of the Parties
MRV	Measurement, Reporting and Verification

N_2O	Nitrous oxide
NCCAP	National Climate Change Action Plan
NEAP	National Environmental Strategy and Action Plan
NGO	Non-governmental organization
NMS	New Member States
OECD	Organization for Economic Cooperation and Development
OPEC	Organization of Petroleum Exporting Countries
PFC	Perflourocarbon
R & D	Research and development
RMU	Removal of units for biological sinks
SBI	Subsidiary body for implementation
SBSTA	Subsidiary body on scientific and technical advice
SCCF	Special Climate Change Fund
SF_6	Sulphur hexafluoride
SPO	State Planning Organization
TEMA	Turkish foundation for combating soil erosion, for rainforestation and for the protection of natural habitats
TGNA	Turkish Grand National Assembly
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
VER	Voluntary emissions reduction
WBCSD	World Business Council for Sustainable Development
WCED	World Commission on Environment and Development
WMO	World Meteorological Organization
WTO	World Trade Organization
WWF	World Wildlife Fund

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I. INTRODUCTION

Nowadays, the world faces many challenges including, economic crisis, international terrorism, and fight against epidemic diseases, underdevelopment and poverty. Nevertheless, overcoming economic crisis and addressing the climate change are the two main concerns of the world agenda in the last years. In almost every international meeting, the world leaders grant high priority to tackle these two challenges simultaneously. The challenge is to tackle the ever biggest global economic recessions since 1929 and facilitate continued economic growth and social progress, while addressing climate change in the framework of sustainable development.

The most of the economists argue that the world should come over these two crises together. They suggest that risks and challenges could be turned into opportunities if measures are applied to transform to the low-carbon economy. Hence, they argue that measures respecting the world resources and promoting sustainable development will boost the economy while protecting the environment. In this respect, the double challenges of economic crisis and climate change, can be a crucial opportunity to "green" the world economy and lay the foundations for low-carbon and resource-efficient growth.

Given that numerous economic recovery packets have been announced following the recent economic crisis, fiscal measures for economic recovery and job creation should be compatible with developing a low-carbon world economy. In this respect, majority of G20[1] recovery packages include elements of increased spending on some or all of low-carbon power, energy efficiency, research and development (R&D), changing consumption and production patterns, as well as waste and water treatment and pollution control.[2] In this respect, the European Economic Recovery Plan, which was adopted by the Commission in November 2008, includes measures and tools to improve energy efficiency, boost sales of green products, develop information and communication technologies broadband infrastructure and clean technology for cars and construction.[3]

[1] Combined efforts of G20s constitute a critical mass to trigger a global green recovery since they account for roughly three quarters of global gross national product, energy consumption and carbon emissions.
[2] Ottmar Edenhofer and Stern Nicholas, *"Towards a Global Green Recovery Recommendations for Immediate G20 Action"*, 2009 , p.20.
[3] EC, Communication From the Commission To The European Council, A European Economic Recovery Plan, COM(2008) 800, Brussels, 2008.

Global economic crisis and climate challenge should be tackled by sustainable thinking, which requires policies and projects with long-term consequences, such as large-scale infrastructure projects, transport networks, major land use planning initiatives, urban development master plans that foster economic development while reducing poverty. Business can be a leading factor in integration of climate change issues into the world markets and global trade. As OECD underlines, the climate change risks should be considered systematically in development planning at all levels in order to integrate to adaptation measures.

These considerations have been underlined once again in Summit on Climate Change in New York in September 2009 by participation of almost 100 world leaders upon the invitation of the UN Secretary-General Ban Ki-moon in order to mobilize political will and strengthen momentum for a fair, effective, and ambitious climate deal in Copenhagen in December 2009. The most of the leaders emphasized importance of placing climate change response in the broader context of sustainable development. In this respect, it is widely acknowledged that it is essential to shift the world economy onto a low-emissions path and build climate- resilient societies. During the meeting, the world leaders recognized that action on climate change should be consistent with developing country priorities for poverty eradication and sustainable development.[4]

In the last couple of decades the world have witnessed the rise of the environmental problems, among which the global climate change is being recognized as the most significant and severe due to its complex nature and unprecedented impacts for the future generations. The climate change is a serious and long-term threat that affects individuals in every part of the globe. Nevertheless, the climate change disproportionately affects developing countries, especially the Least Developed Countries and Small Island Developing States, and poor and vulnerable people within those countries. Climate change has serious impacts such as droughts, floods, extreme weather events and sea level rise, which may contribute to food shortages, infrastructure damage and the degradation of natural resources. All these factors would jeopardize development gains achieved so far. In this respect, it is vital to adapt to the impacts of climate change within the principles of sustainable development. Hence, climate change is not just an environmental issue but an economic, social and political challenge.

[4] Statement of UN Secretary-General Ban Ki-moon on Climate Change Summit at UN. 22.09.2009 http://www0.un.org/apps/news/infocus/sgspeeches/statments_full.asp?statID=586

The issue of climate change is now widely recognized as one of the major threats of the 21st century, not only because it may significantly affect many countries and individuals, but also actions and also inaction to climate change may have extensive consequences for almost all sectors of the economy. In this respect, as all the countries, Turkey should take an active policy in international and domestic area in order to combat to climate change. Turkey's climate policies have threefold dimension, in terms of domestic, international and EU relations.

This thesis claims that sustainable development targets and measures are compatible with the measures addressing climate change, so that Turkey should be an active part of the new climate regime[5] in line with its capacities, responsibilities and development goals. The aim of this thesis is to understand the place of Turkey in global climate policies in relation to its EU accession process. In order to achieve this, it is essential to understand the concept and theoretical discussions on sustainable development and climate change. In this respect, following the introduction in the first chapter, the second chapter is devoted to the theoretical approaches to the concept of sustainable development and international cooperation on sustainable development, environmental protection and climate change policies while analyzing the correlation between these policies.

For the sake of the world and future generations, countries should achieve emission reductions at lower cost, while at the same time boosting economic development. In order to boost aggregate demand and employment, governments need to improve energy efficiency, upgrade the physical infrastructure and support clean technology markets in the short term, while initiating forerunner projects, enhancing international research and development and incentives investment for low-carbon growth in the medium term.

It is argued that these actions would foster sustainable economic growth, create jobs and wealth, avoid dangerous climate change and reduce sources of global instability such as energy insecurity and resource competition. In this framework, "the growth-based agenda of building a low-carbon world economy would deliver immediate and long-term economic benefits, cut the risk of dangerous climate change thereby laying the foundation for

[5] Regimes are defined as "social institutions governing the actions of those involved in specifiable activities. Regimes consist of recognized roles linked together by clusters of rules or conventions governing relations among the occupants of these roles". See Oran Young, "*International Cooperation: Building Regimes For natural Resources and the Environment*", Cornell University Press, London, 1989, p.12.

sustainable growth and future prosperity."[6] Most of the countries' top agenda is occupied with considerations of fostering economic growth, promoting development and increasing social welfare. In a broader context these issues should be handled within the framework of sustainable development. Climate change adaptation measures will greatly enhance the benefits and sustainability of many development initiatives.

The third chapter examines the development and evolution of international sustainable development and environmental policies within the context of the UN. The international community started to draw attention to environmental issues by early 1970s. The UN Conference on Human Environment, which was held in Stockholm in 1972, has been a turning point in this respect since it has been the beginning of a new era in terms of legitimization of the environmental issues in the international politics. This has been followed by the declaration of "Our Common Future" in 1987 at the World Conference on Environment, where the concept of sustainable development was defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".[7] Therefore, "sustainable development" has been placed firmly into the political arena of international development and international initiatives have been taken gradually, in order to integrate sustainable development and environment with other policies. Although being rather slow, this process has been ongoing in the general framework of global combat against climate change.

In the forth chapter, I examine the fact of climate change, its impacts and relation with energy sectors and the measures to tackle it. In this respect, the facts of climate change are examined in parallel to the global policies in order to address this problem. The world's leading experts are assembled under the auspices of the Intergovernmental Panel on Climate Change (IPCC) in order to examine the trend of greenhouse gases (GHGs) and their impact on the earth. The IPCC declares that concentrations of GHGs are rising due to human activities, particularly since the industrial revolution. In addition, the IPCC agrees that this increase has already had a discernible influence on the earth's climate.[8] Consequently, the mean global temperature

[6] Ottmar Edenhofer and Stern Nicholas, *"Towards a Global Green Recovery Recommendations for Immediate G20 Action"*, *op. cit*, p.23
[7] WCED, World Commission on Environment and Development*, "Our Common Future"*, Oxford University Press, United Kingdom, 1987, p. 43
[8] IPCC, Inter-governmental Panel on Climate Change, *"Climate Change 2001: Synthesis Report Summary for Policymakers",* 2001. www.ipcc.ch/ipccreports/tar/vol4/index.php?idp=0

increased by almost 0.76°C over the course of the 20th century, the most of the warming occurred in the last few decades following a sharp increase in GHG concentrations since the 1950s. Depending on the IPCC's scenarios, the earth's average surface temperature is estimated to increase by between 1.1°C and 6.4°C (relative to 1990) by the end of the 21st century.[9] Similarly, the OECD projects that world GHG emissions would increase 70% by 2050 unless new policy actions are taken. This dramatic increase of GHG emissions would lead to a rise in world temperatures, which in turn result in destructive sea level rise and storm surges, more frequent and intense heat waves, more violent hurricanes, more floods and droughts, and agricultural yields declining in many parts of the world. Therefore, ambitious policy action to address climate change makes economic sense.[10]

This thesis draws attention to the relation between the energy and climate change and claims that these policies should be integrated. With the purpose of having a comprehensive understanding, interdependency of climate change and energy policies has been examined. In order to recover the current economic crisis, raise living standards and reduce poverty, there is a global need for ever-increasing amounts of energy while combating with climate change. Current trends in energy use and energy policies are not sustainable since the world has scarce resources and carbon dioxide (CO2) emissions continue to rise in the atmosphere, which in turn accelerate global warming. It has been established that the CO2 emissions, which are largely traced to energy use, constitute the largest contribution among major green house gases. Energy-related carbon dioxide now accounts for 61–65 % of global greenhouse gas emissions.[11]

The global energy demand has been rising constantly and tends to rise more in the near future. According to the International Energy Agency (IEA), global energy demand is projected to grow by 44% over 2006 to 2030 period while global electricity use will almost double. The IEA estimates that $26 trillion in supply infrastructure investment needed to meet this demand.[12] Therefore, ensuring a predictable supply of energy is one of the top policy

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See also, IPCC, Inter-governmental Panel on Climate Change, *"Climate Change 2007: Synthesis Report Summary for Policymakers",* 2007. www.ipcc.ch/pdf/assessmentreport/ar4/syr/ar4_syr_spm.pdf.

[9] IPCC. "*Climate Change 2007: Synthesis Report Summary for Policymakers, Inter-governmental Panel on Climate Change",* 2007.

[10] OECD, *"Environmental Outlook to 2030"*, Paris, 2008.

[11] IEA, International Energy Agency, *"World Energy Outlook 2008",* Paris, 2008.

[12] IEA, International Energy Agency, "*The World Energy Outlook 2009 Climate Change Excerpt Special Early Release at Bankong UNFCCC Meeting*", Paris, 2009.

priorities in the major global economies. Secure, predictable, accessible and affordable energy is indispensable for economic growth, social development and improved quality of life.[13]

The developing countries are on the way to fossil fuelled path to prosperity as the industrialized nations did in the last century. However, the world cannot afford this anymore, so that there is a need for new forms of technology, new patterns of production and consumption and co-operation between industrialized and developing countries in order to avoid that more countries get locked into a high carbon energy system. Countries seek to develop and implement cost-effective policies to address climate change and to move towards a low carbon economy. There is a need to develop cleaner technologies in key areas, such as renewable energy, transport and energy-intensive manufacturing.

Neither the developed nor the developing countries can effectively address global climate concerns alone, so global cooperation and collaboration are indispensable. In this respect, chapter five is devoted to the international cooperation under umbrella of the United Nations (UN) for combating climate change. In this respect, the United Nations Framework Convention on Climate Change (UNFCCC), which has been ratified by 192 countries so far, has been the political forum for the construction of international action on climate change. The international community has agreed to take first steps against global climate change with the UNFCCC and the Kyoto Protocol. The UNFCCC, which came into effect in 1994, has an ultimate objective to stabilize the climate to prevent dangerous anthropogenic interference with the climate system. After the expression of political good-intention to combat climate change, the international community wanted to go one step further in 1997 by Kyoto Protocol. However, the Protocol could come into effect in 2005, due to the precondition of at least participation of 55 countries corresponding to the %55 of total global GHG emission.

Under the Kyoto Protocol, developed countries of Annex I, which are called by the Protocol as Annex B, have commitment to reduce their GHG emissions together by around 5% below the 1990 levels in the first phase of 2008-2012. Since industrialized countries carry most of the historical responsibility for global climate change, the Protocol urged them to take the first steps in reducing emissions. Up to today 186 countries and EC have ratified the Protocol, but, the USA has consistently rejected the Kyoto Protocol, while the EU, as a leading power, has

[13] IEA, International Energy Agency, "*The World Energy Outlook*", 2008.

committed itself to reduce emissions 8% between 2008 and 2012 compared to 1990 levels. Hence, in the absence of the US, the EU has become the leader[14] of international climate regime. The technical reports demonstrate that the EU and most of the Member States are on track to meet their commitments. The projections indicate that the EU-15 will achieve its 8% reduction target through existing measures, the purchase of emission credits from third countries and forestry activities that absorb carbon.

Although climate change is on the global agenda for many decades and international efforts of the UNFCCC have been followed by the Kyoto Protocol, we can not say that global community is successful in addressing the climate change, mainly due to the legally unbinding character of agreements and lack of political will. Global cooperation in combat against climate change is constantly slowed down due to numerous reasons. First of all, most of the countries are hesitant due to the uncertainty factors concerning the levels and impacts of climate change as well as the high economic costs of required policy actions. Despite the IPCC reports, there are still some skeptics questioning whether it was part of a natural cycle or anthropogenic. Although mitigation and adaptation policies are considered to be costly, it is more likely that cost of inaction is much higher in the long term. Second, the North-South debate hinders the cooperation due to different levels of development and historical responsibility. According to the developing countries, the application of uniform policies to reduce emissions is unjust.

It is broadly recognized that further steps are necessary to stabilize the climate in the long term. For that purpose, in December 2009, the Copenhagen deal on post-2012 climate regime is expected to be a milestone on the road to a low-carbon economy. Currently, international climate change policy is in a critical stage. The Kyoto Protocol will end in 2012, so that the post-2012 climate regime negotiations process was launched by COP 13 in Bali in 2007. The Bali Roadmap outlines the negotiation framework towards the adoption of a new global post-2012 climate treaty by the end of 2009. Bali Road Map represents a breakthrough in the mindset in terms of its approach to global climate change and its management since it fosters shared understanding for the necessity of common efforts, both by developed and developing

[14] The leadership is defined as "the ability to give direction to institutional arrangements" and leader as an actor that plays "important roles in seizing opportunities generated by exogenous events, structuring bargaining processes to focus on integrative rather than distributive issues and putting together deals or packages of provisions that offer enough attractions to all parties to elicit their support". See Oran Young, "*International Cooperation: Building Regimes For natural Resources and the Environment*", *op.cit*. p.235.

countries. Moreover, it links the climate change to economic growth and sustainable development goals and needs. In this respect, actions and measures fall across a variety of economic sectors.

The Bali Road Map develops negotiation structure into four building blocks, namely mitigation, adaptation, technologies and finance. A new post-2012 policy regime on global climate change aims to set a quantified global goal for stabilizing GHG and to establish robust policy mechanisms in order to ensure that this goal is achieved. It is expected that the climate negotiations will be completed and a political decision on emission reduction targets and timeline will be adopted at COP 15 in December 2009 in Copenhagen. Nevertheless, it is still unclear whether there will be a political decision to create a new global climate regime for post-2012 that will be followed up by a legally binding agreement imposing emission reductions, tools and measures.

There are many challenges in front of the global consensus in this respect. The first challenge is to swiftly shift to low-carbon economies in developed countries while supporting developing countries to build and restructure their energy systems in a climate friendly way, by promoting supportive policy environment and technology transfer. Other related issues are to increase global justice, adaptation to climate change and protection of biodiversity. Also, it is crucial to conduct additional investment and financial flows to reduce global GHG emissions. Moreover, in the post-2012 climate regime, the involvement of the US is very important for the participation of the other major emitters like China as well as the developing countries.

In this international structure, the European Union has been one of the most effective actors in climate change and sustainable development policies. Although it was initially established as an economic community, especially in the last decades it has influential environmental policy in the frame of sustainable development. Hence, in the sixth chapter, I examine the climate policies of the EU in the way to sustainability, taking into consideration the role of the EU on global climate policies, which in turn has influence on policies of Turkey as an accessing country. As a global and regional actor, the EU is eager to push further the combat against global climate change. In 2009 the EU initiated a new Energy and Climate Policy, which integrates effectively and proportionally the key challenges of competitiveness of European companies, security of supply and environmental protection. Through this policy, the EU

commits itself to reduce GHG emissions 20% from 1990 levels, increase renewable energy to 20% of primary energy supply and increase energy efficiency 20% and increase biofuel in transport fuels in sustainable ways to 10% by 2020. The EU agreed to reduce GHG emissions 30% by 2020 relative to 1990 levels on the condition that other countries also commit to reductions in post-2012 climate regime.

The EU confronts a challenge to satisfy rapidly growing energy demand while protecting the environment. In this respect, the main challenge for the EU is to keep the balance of energy and climate change policy in a sustainable way while ensuring the European competitiveness in the global market. In the absence of "single voice" in the EU and global level, the EU has a difficult task of pushing other international actors, especially the US, for the post-2012 climate regime.

In chapter seven, I will try to examine the position of Turkey in global climate policies, which have domestic, international and EU perspectives. In this respect, historical evolution as well as current position of Turkey's climate change policy should be assessed in respect to international climate negotiations and the EU accession negotiations. In the international efforts to address climate change, Turkey's situation is unique and rather complicated. As a member of the OECD, Turkey has been placed in Annex I and Annex II, developed countries lists, during the formation of the UNFCCC in 1992. Depending on its rather lower level of economic and industrial development, Turkey has objected to be listed in developed country list and have commitments, so that it did not ratify the UNFCCC for a decade.

Turkey became party to the UNFCCC on 24 May 2004 following the decision 26/CP7 taken at the 7th COP in Marrakech in 2001. This decision recognized the "special conditions" of Turkey, keeping its name in Annex I and deleting it from Annex II, since Turkey has different position from the other Parties included in the list of Annex I of the Convention. It took Turkey over a decade to ratify the UNFCCC due to its misplacement in the annexes. In this respect, Turkey also could not take part in formation of Kyoto Protocol, since it has not ratified the UNFCCC by that time. Although Turkey became party to Kyoto Protocol finally in August 2009, as a late comer, it did not get any commitment in 2008-2012 commitment period. Consequently, Turkey is the only Annex I country without being Annex B, so not having a commitment until 2012 and not being able to benefit flexible mechanisms of the Kyoto Protocol.

As a highly import and fossil dependent country in terms of energy, Turkey's total GHG emissions are rising rapidly due to fast growing population, energy use, industrialization and economic development. Nevertheless, Turkey's emissions per capita is still far below the EU, OECD and even the world average, since as a developing country, Turkey's level of industrialization is much lower than the EU levels. In the process of the EU accession, Turkey faces challenge to ensure energy security and satisfy rapidly growing energy demand while trying to comply with evolving energy and climate change policy of the EU. Turkey's climate policies can not be considered without the EU perspective of the country. Complying with the provisions of the Acquis Communautaire related to environment and climate change may help simultaneously Turkey to take its place within the global climate regime and to achieve its possible commitments in the future.

In the post 2012 climate negotiations, the global community, particularly the EU, expects Turkey to have commitments, as an OECD member and as an accessing country to the EU. The EU expects all the candidate and accessing countries to share the EU's emission reduction targets. Nevertheless, Turkey is neither capable nor willing to have emission reduction commitments from the base year 1990, which in turn would hamper its economic and industrial development. On the other hand, Turkey declared that it can commit 11% reduction from business-as-usual emission rates by 2020. Therefore, possibilities and capacities of Turkey to take binding commitments are limited, so that urgent actions are needed to position Turkey in the post 2012 regime. In this framework, Turkey needs to defend its position with reliable data and information concerning its level of development, emission reduction potentials and strategies of the sectors. Although, Turkey has already taken some measures to reduce GHG emissions, including development of National Climate Change Action Plan (NCCAP), there is a need for further studies and strategies to support Turkey's position in post-2012 climate regime.

In respect to methodology, analysis and sources, this thesis is based on literature review of existing academic literature, scholarly papers, the official documents of the United Nations, the European Union and international organizations as well as internet-based information sources and electronic databases. Both domestic and foreign sources are used in order to secure objectivity and avoid an incomplete assessment. This thesis strives to provide a comprehensive picture of existing sustainable development and climate change discourse in international and EU level as well in Turkish politics. The analysis is more at the policy level

than implementation in detail. Moreover, it is important to note that the international climate change negotiations are ongoing and it is expected that in COP 15 in December 2009 in Copenhagen, parties will reach to a political decision that will be followed by a new legally binding international climate change agreement for post-2012 period. Hence, the students of political science and international relations should follow these developments and examine their effects on international policies as well as the EU and Turkish policies in this respect.

II. THEORETICAL APPROACHES: SUSTAINABLE DEVELOPMENT FOR ENVIRONMENTAL PROTECTION AND COMBAT AGAINST CLIMATE CHANGE

2. 1. Concept of Sustainable Development

In the 21st century environmental crisis and economic development have emerged as a dilemma. Economic growth is considered responsible for the environmental crisis, so that the international community sought for new ways of development that would not only end this degradation, but also sustain the development process. Hence, sustainable development has emerged as a solution to this dilemma and over time it has become one of the most controversial concepts of the modern state.

The goals and means of development policy as well as corresponding theory have varied over time.[15] Generally the goal has been economic growth, associated with human development, industrial development and social development. In the post-Second World War period, the major problem of development policy in international order has been the appalling differences in the distribution of wealth, which is also called as "North-South problem". The main challenge is how to foster development in a way reducing this cleavage and eradicating poverty, namely the "North-South equalization". The means to achieve this goal have been varied and controversial throughout the decades. During the 1960s and 1970s, state intervention was common, while the neo-liberal approaches have dominated to the 1990s. The current global crisis and diverging inequalities urge people to find better solutions immediately.

"Development" as a word reminds something good about the progress and positive effects for future generations. The growth has been always praised for the benefit of the future. However, the point where we stand now proves the opposite, since the problem of development is considered together with issues environment and resources. The development requires economic growth, which sooner or later turns out to unsustainable.

Development today is achieved at the expense of the resources of future generations. In industrialized countries, growth and development targets have been reached over the carrying

[15] Jan Nederveen Pieterse, "*Development Theory: Deconstructions/Reconstructions*" Sage, London, 2001, p.6.

capacity of the earth. This dramatized the problem of equal distribution and North-South problem, since the poorest have been the first affected by the global environmental problems, such as climate change and their side effects, including hunger, security, floods and heat shocks. On the other hand, it is argued that economic growth and development are vital to tackle adverse environmental impacts of existing practices and technologies. For instance, development of environmentally friendly technologies, namely the green technology, which can adverse the environmental damages, requires certain level of economic development and welfare.

Literally, sustainable development refers to maintaining development over time. There are numerous different definitions of sustainable development in a range of disciplines depending on various assumptions about the basic relationship between society and nature. Sustainable development is widely accepted as a desirable policy objective adopted by many institutions, such as the UN and the OECD, which are concerned with the future development of the global resources,. The global challenge of sustainable development lies in complex interdependencies of environment as well as social and economic development.[16]

Over time, sustainability objectives have been transformed from relatively simple issues of environmental protection to include international and national social, economic and ecological issues. The interaction between economic activities and the quality and sustainability of the environment are the foundations of the concept of sustainable development. Although it is generally accepted as a guiding principle in development planning, there is not much consensus about the implementation of sustainable development because of differences in interpretations. These differences are related to various worldviews concerning the relationship between humankind and nature.[17]

The roles of the natural environment and natural resources have been discussed since the classical economists. The classical economic view acknowledges natural resource scarcity in line with the economic growth. Neoclassical economist approach focused on the role of capital and human labor as the main factors of production during the industrialization process. Natural resources have been considered in relation to their impact and role on the market. The negative impacts of economic activity on environment have been ignored in mainstream

[16] Jennifer Elliott, *"An Introduction to Sustainable Development",* Routledge, 2006, pp.7-9.
[17] *ibid,* p.9.

economic analysis. However, awareness about ongoing environmental degradation has been emerged gradually so that the multi-faceted feature of environmental problems has been recognized. Hence, it has been acknowledged that there is a mutual relationship between ecological and economic systems.

Sustainable development approach is composed of six major principles, including integration of environmental protection and economic development, futurity, environmental protection, equity, quality of life and participation.[18] Within this approach, the relation between environmental protection and economic development can be translated into positive-sum[19] game from zero-sum[20] game. According to the UN, sustainable development policies should contain the integration of three areas and pillars, which are economic, environmental and social.[21]

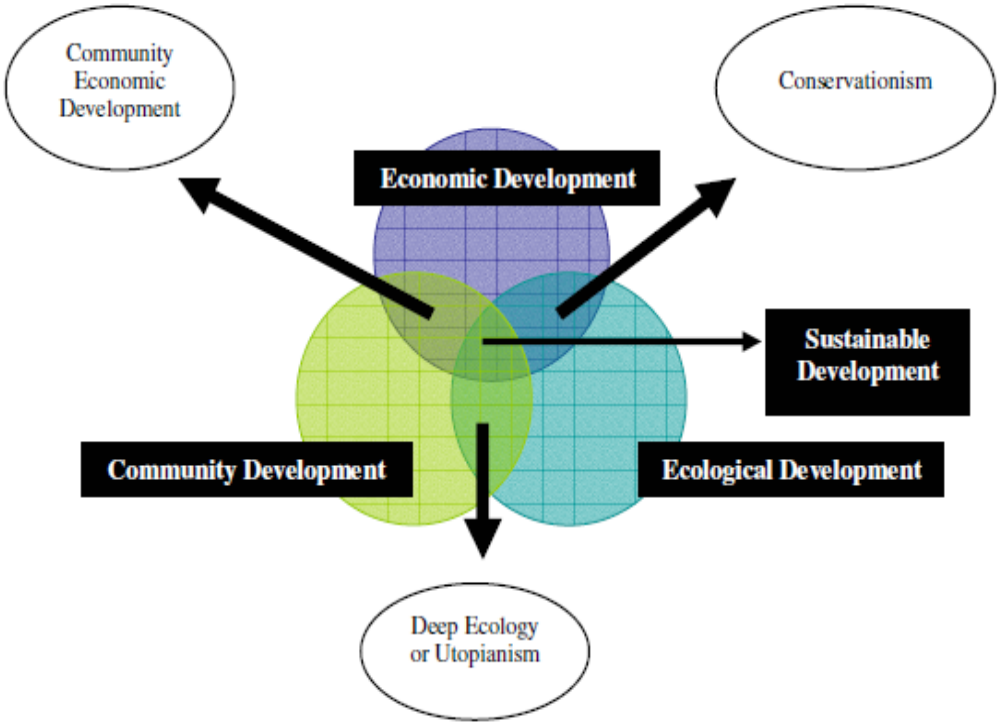
In order to boost economic development, the production of goods and services requires the input of resources and the dissipation of energy. Since the energy can not be recycled and substituted, it is one of the most important inputs of production processes. In order to sustain and improve economic activity, the most of the energy inputs is provided by fossil fuels that are irrevocably lost after being dissipated. However, the use of fossil energy is unsustainable since the world reserves are limited and the combustion of fossil fuels leads to the increase of the GHG emissions.

In many countries "development reversal" is considered as rising proportions of people below basic poverty lines and falling life expectations. Many of the development patterns and processes will not be able to supply the needs of the world's population into the future and cannot deliver the higher living standards to the rising number of population.

[18] Michael Jacobs, "Sustainable Development as a Contested Concept*"* in Andrew Dobson and M. Jacobs (eds), *Fairness and Futurity*, New York, Oxford University Press, 1999, p.26.
[19] Game theory is "a branch of mathematics that offers a way of formalizing many social and political problems and activities." In positive-sum games "there is a potential for mutual gain" See Roger Scruton, *"A Dictionary of Political Thought"*, London: Macmillan Publishers Ltd., 1996, p.211
[20] Zero-sum games are "games of conflict: one player's gain is another's loss". See Roger Scruton, *"A Dictionary of Political Thought"*, London: Macmillan Publishers Ltd., 1996, p.211.

Figure 2.1 Sustainable Development

Three Distinct Development Processes (underway at the local level-economic development, community development, and ecological development.)



Source: P. Newman & J. Kenworthy

2.1.1. Social Aspects of Sustainable Development: Inter-generational and Intra-generational Justice

The sustainable development has been considered in different contexts in 1990s and the early 21st century. Increasingly globalized world offers new opportunities and challenges for the environment and development. Apart from the states, new actors, including international institutions, transnational corporations and civil society organizations influence the resource development and management. Sustainable development is declared as a principal policy goal of major institutions of the world, including the United Nations, the World Bank, and the World Trade Organization. Therefore, this process is complicated by the inclusion of new technologies in addition to new actors. The main challenge of sustainable development is how to ensure that process of globalization operate in reaching the needs of the poor rather than to

marginalize particular groups. Therefore, the question is whether the trends of globalization were compatible with the environmental condition of sustainability.

The production structure has changed radically in the early ages of industrial development. There was a transition from agricultural production to heavy industry, which is much more polluting. Gradually, in the last decades, it observed a shift of production and labor to "light" industry and services, which pollute less, consume less energy so that cause less environmental degradation. Environmental quality is considered as a "luxury" in the first phase of industrial development, but it is seen crucial for improving the overall quality of life in the second and the post-industrial phase.[22]

It is claimed generally that process of globalization, which accelerates per capita income growth, eventually tends to reduce environmental deterioration, in the long term. In the developed countries, the consumers put growing pressure on producers to respect environmental quality in production processes. Moreover, voters press the political leaders to reinforce environmental policies.

In terms of sustainable development initially, the attention was given to the environmental equilibrium of the biosphere, while ignoring almost completely the social aspects. However, the importance of social aspects has been increasingly recognized. Actually, sustainable development "implies a commitment to social equity between generations which for consistency's sake must be extended to equity within each generation".[23]

The "inter-generational condition" of sustainability refers to that freedom of choice of future generations is not compromised by short-term decisions of the preceding generations.[24] Inter-generational justice, which "is the justice between two different generations", has two dimensions, namely environmental dimension and the financial inter-generational justice within the debts.[25] Decisions and actions of present generations impact survival of future generations, so the real freedom of future generations will depend to a large degree on the state of the natural environment that they inherit. This is called "environmentally sustainable",

[22] Marcello Basili, Maurizio Franzini, Alessandro Vercelli, *"Environment, Inequality and Collective Action"*, Routledge, 2006.
[23] Alessandro Vercelli, *"Globalization and Sustainable Development*", University of Siena Economics Working Paper No. 399, September 2003, p.3
[24] Graciela Chichilnisky, "What is Sustainable Development?", *Land Economics*, 73 (4), 1997, pp: 467-491.
[25] Yois and Agee, *"What's a Sustainable Europe?",* 2003, p.5.

which means that ecological equilibrium of the biosphere should not be hindered by indices of environmental deterioration.[26] Efficient usage of resources and economic efficiency are vital to increase the life standards of present and future individuals.

The intra-generational condition of sustainability on the other hand, means to guarantee equal opportunities to all participants in the market competition, which is provided by presence of sufficient initial equality among competitors, namely equal access to all significant economic options.[27] Intra-generational justice covers various forms of justice, including social justice, ecological justice and gender justice within the same generation within the same time. On the other hand, social sustainability is related to income inequality and poverty, which causes malnutrition and reduces the chance to be involved in economic activity. Therefore, poverty reduces access to economic opportunities.[28]

The notions of environmental sustainability and social sustainability are founded on principles of equity, freedom, and equal opportunities, which are not in conflict with the economic objectives. The main notion is that sustainable development is not in conflict with the economic goals in the long term. Indeed, the problem emerges in the short term decision making, which jeopardize with the long term objectives and requirements of sustainable development. Consequently, sustainability refers to both intra-generational justice and inter-generational justice indicating three dimensions of sustainability that are ecological, economic and social.[29]

2.1.2 "Strong" and "Weak" Forms of Sustainable Development

The "strong" and "weak" forms of sustainable development are vital concepts to understand national and international sustainable development policies in the contemporary world. The strong version of sustainable development holds that economic activity and development should be limited in a way not going beyond the carrying capacity of our planet. On the other hand, the weak form of sustainable development suggests that the degree of environmental protection should be decided in a way not disturbing or preventing economic development.

[26] Alessandro Vercelli, "*Globalisation and Sustainable Development*", *op.cit.,* p. 4.
[27] This does not imply either an absolute equality of distribution or a rejection of reasonable merit-based distribution criteria based on the results of individual efforts, as long as market competition is not distorted by an unequal access to economic opportunities. Alessandro Vercelli, *op. cit.*p.5.
[28] Alessandro Vercelli, *"Globalization and Sustainable Development*", *op.cit.,* p.4.
[29] Yois and Agee, *op.cit.*p.6.

The defenders of the “strong sustainable development” think that not all forms of economic growth are environmentally harmful. They claim that economic growth should not harm or destroy the 'critical natural capital', which are irreplaceable natural resources and services essential for the well-being and integrity of the planet's biosphere; such as climate regulation, biodiversity and ecosystem stability. On the other hand, the defenders of "weak sustainable development" argue if human beings accumulate enough capital to employ in new technologies then any damages to natural capital can be compensated by equivalent amounts of human capital. Accordingly, human being would loose species and rainforests, but will gain roads, airports, new technologies and human achievements to survive.[30]

Jacobs defines these concepts as, “weak version of sustainable development adopts less stringent idea of environmental conservation whereas strong version of sustainable development adopts the more stringent idea of environmental limits.”[31] These different explanations of the sustainability depend on the eco-centric and anthropocentric approaches.[32] Strong version of sustainability is in line with the notion of deep ecology that questions the human-nature relationship. Hence, the pre-eminent radical eco-centric moral theory has the primary aim of preserving nature from human interference. In this respect, eco-centric theory rejects the anthropocentric belief that “humans are placed at the centre of the universe, separated from nature and non-human world has only instrumental value whereas only humans have intrinsic value.”[33]

"Business as usual" economic growth approach of the weak conception does not favor putting restrictions on amounts and kinds of growth. Therefore, if environmental problems can be handled by the conventional technological innovation, they can be stimulated by the demands of capitalist market. They argue that there can be threats to human health and well-being arising from the economic practices and growth. However, these threats would be neutralized by the technology and innovation. This notion is called as "ecological modernization", which

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[30] John Barry, Brian Baxter, Richard Dunphy, *“Europe, Globalization and Sustainable Development”*, Routledge, London, 2004, p.2.

[31] Michael Jacobs, “Sustainable Development as a Contested Concept*”* in Andrew Dobson and M. Jacobs (eds), *Fairness and Futurity*, New York, Oxford University Press, 1999, p.31.

[32] According to eco-centeric approach, people should have a strong sensibility in order to protect the natural environment. Therefore environmental protection can be achieved by the human sensibility. However anthropocentric approach regards the environment having only an instrumental value, which also means anthropogenic value, for the protection of environmental values. See James Connelly and Graham Smith, “*Politics and the Environment from Theory to Practice”,* London and New York, Routledge, 2003, p: 26.

[33] Neil Carter, “*The Politics of the Environment: Ideas, Activism, Policy”,* Cambridge University Press, UK, 2001, p.15.

claims that less environmentally-harmful products and production techniques would promote innovations creating employment, generating aggregate wealth and leading to effective solutions to these problems.[34] Hence the central pillar of ecological modernization and globalization is prevention and resolution of environmental problems through utilization of market forces.

2.1.3. Ecological Modernization and Sustainable Development

The notion of "ecological modernization" has arisen in the Western Europe in the 1980s and helped to reduce antagonism between growth and environmentalism. Ecological modernization is generally considered as the weak version of sustainable development, which defends an approach of "keep it, but fix it".[35] This approach doe not mention about equality, both in the sense of wealth distribution and participation. Also it does not call for an action to change the existing production and consumption patterns. Indeed, it believes in the ability of human beings and modernity to find a solution to the environmental problems by deploying technology and replacing natural capital with the human-made capital.

Joseph Huber and Martin Janicke are considered as the founding fathers of the ecological modernization, which briefly "offer the promise of protecting the environment by reforming capitalism."[36] By not proposing radical change at the international system, ecological modernization rather "refers to a restructuring of the capitalist political economy along more environmentally sound lines."[37]

Hajer defines ecological modernization as "the discourse that recognizes the structural character of the environmental problematic but none the less assumes that existing political, economic, and social institutions can internalize the care for environment. For this purpose, it introduces concepts that make issues of environmental degradation calculable."[38]

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[34] i*bid.* p.2. see also John Dryzek, "*The Politics of the Earth: Environmental Discourses"*, Oxford University Press, New York, 1997, p. 45-60.
[35] John Dryzek, *op.cit.* p. 45-60.
[36] Neil Carter, *op. cit.*, p.6.
[37] John Dryzek, *op. cit.*, p.141.
[38] Maarten Hajer, "*The Politics of Environmental Discourse: Ecological Modernization and the Policy Process",* Clarendon Pres, Oxford, 1995, p.25.

According to the ecological modernization, economic growth and environmental protection are mutually beneficial in a sense that integration of growth and environmental objectives drives the way to the win-win-win situation for the environment, economy and business. Hence, strict environmental regulations and policies are not considered as a burden for industry but as an incentive to innovate and compete. In this respect, the so-called "Porter hypothesis" claims that growth and environmentalism are compatible since competitiveness depends on this link.[39]

The market is the key feature in ecological modernization. However, it does not emphasize the pure market forces, such as removal of the state or other forms of interventions to the market, but rather promotes utilizing intervention to correct market failure and to create a framework for a positive interaction between economic development and environment. It does not support rigid command and control regulations and standards of regulating and constraining the business activities. Instead, market based instruments, such as taxation, eco-labeling and emission trading systems, are encouraged to reach the goal. The ecological modernization assumes that innovation, which is stimulated by the pressure of a market economy and facilitated by an enabling state, can contribute to economic prosperity and reduce environmental degradation. The notion of ecological modernization brings different stakeholders with different interests to a common ground in which environmental debate is transformed from confrontation to consensus and cooperation. While introducing environmental protection in a way less threatening the business, it encourages the firms and states to foster research and innovation for environmental protection as well as for competitiveness and profitability.[40]

Gouldson and Roberts handles ecological modernization in two ways; first of all the modern society responds to the increased awareness and anxiety about the ecological risks associated with industrialism. The other way of ecological modernization is considered as a concept to guide doctrines of policy reform. Hence, it promotes the application of new forms of environmental policy, which affects positively the economic development, rather than limiting the growth. Instead of perceiving economic development as the source of environmental decline, ecological modernization favors economic policies that harness the

[39] Porter, and C. van der Linde, "Toward a New Conception of the Environment Competitiveness Relationship*", Journal of Economic Perspectives"*, 1995, pp.97-118.
[40] Debra Johnson, "Ecological Modernization, Globalization and Europeanization", in John Barry, Brian Baxter, Richard Dunphy, *Globalization and Sustainable Development,* Routledge, London, 2004, p 155-157.

forces of entrepreneurship for environmental gain.[41] Therefore, the classical zero-sum game of environment and development is reformulated as a positive-sum game, which is actually a win-win situation.

The basic principles of ecological modernization are considered as internalization of the environment, economizing ecology, academy-industry interaction, flexible regulation regimes, optimization, international cooperation, faith in development of science and technology, efficiency and 'pollution prevention pays'.[42] However, ecological modernization is criticized by not suggesting any radical change at the international system, but rather "referring to a restructuring of the capitalist political economy along more environmentally sound lines."[43] Hence the ecologists criticize ecological modernization for searching "cosmetic solutions".

Concepts of sustainable development and ecological modernization create a ground for compromise between economic growth and environment as well as between concerns and interests of developed and developing nations. The North-South divide can be considered also in the framework for sustainable development, since it is about interests. By arguing that human needs must be met in order to address environmental problems, the concept of ecological modernization is strongly anthropocentric. On the other hand, sustainable development is criticized for being extremely general and vague since it does not provide specific framework how to attain sustainable way of life. But the most important principle of the concept of sustainable development lies in its assumption that environmental problems of growth can be solved by reformulating the limits to growth as social and technological matters rather than ultimately physical and biological.[44]

Sustainable development emphasizes ethics and social justice while ecological modernization focuses on economic issues and mainly the market failure.[45] Moreover, sustainable development gives importance to intergenerational issues. While not paying attention to social

[41] Andrew Gouldson, and Peter Roberts, "Integrating Environment and Economy: the Evolution of Theory, Policy and Practice", *Integrating Environment and Economy: Regional and Local Strategies*, Routledge, 1999.
[42] Andrew Jamison, "Science Technology and the Quest for Sustainable Development" in *Technology Studies and Sustainable Development*, Ed: A. Jamison, H. Rohracher, Munich: Profil Verlag, 2002, pp: 17-40.
[43] John Dryzek, *op. cit.*, p.141.
[44] Norman Vig, *"The Global Environment: Institutions, Law and Policy",* Congressional Quarterly Press, Washington, 2005.
[45] Oluf Langhelle, *"Why Ecological Modernization and Sustainable Development Should not be Conflated"*, Presented at IPSA XVIII World Congress, Quebec, 1-5 August 2000.

justice or international global problems, it assesses regional problems whereas global problems are very important for sustainable development.

Furthermore, ecological modernization is interested in the problems at the national level, while sustainable development is interested in both national and global institutional level. Consequently, sustainable development and ecological modernization in essence both aim at protection of environment and argue that economic development is not an obstacle for environmental protection.[46]

Ecological modernization theory does not contain the basic assumptions of environmentalism, including moral values between nature and human beings and the fact that a transformation is required. Ecological modernization considers nature as valuable as long as it is useful to humans so argue that there will not be environmental problems in the future thanks to the adaptation capacity of human and technology. On the other hand, environmentalism calls for respect for the environment since it is essential for the survival of the human beings. Accordingly, the environment should be protected in order ensure that it continues to provide the basis for human survival.

The answers given to the question of what is to be sustained underlines the distinction between environmentalism and ecological modernization. As Baker emphasizes, "environmentalism points to the aesthetic and moral values that ground our relationship with nature, natural systems and environment and calls for an ecological transformation of society based on major value changes."[47]

The strong version of sustainable development supports the promotion the use of renewable resources and settlement of economic and social structure in a way that would not endanger the ability of nature to renew itself. Instead of deploying technology in to "clean" processes of production, "strong" sustainable development supports using non-renewable in a way that would not damage the environment while seeking for new alternatives for non-renewable.

[46] *Ibid.*
[47] Susan Baker, "Sustainable Development as Symbolic Commitment: Declaratory Politics and the Seductive Appeal of Ecological Modernization in the European Union", *Environmental Politics*, Vol. 16, No: 2, April 2007, p.300.

2.1.4. Environmental Kuznets Curve (EKC)

As the theory of ecological modernization, there is another theory, which is optimist about the development; namely Environmental Kuznets Curve (EKC) of neo-classical economics and a techno-centric worldview. Named after economist Simon Kuznets the environmental Kuznets curve claims that the growth will ultimately provide a solution for environmental problems of developing countries. The EKC is named driving from the original U-shaped Kuznets curve, which demonstrates that income distribution becomes more uneven, stabilizes at middle-income levels and then starts to even out again. According to EKC, environmental degradation and pollution increases, as growth gets underway.[48] However, then it stabilizes at middle-income levels and starts to decline with prosperity. Accordingly, after the satisfaction of the basic needs, priorities shift towards improvement of the quality of life.[49]

The environmental Kuznets curve claims a relationship between economic growth and environmental impact, where economic growth initially leads and accelerates impacts until reaching a turning point, after which further development brings a decline in impacts. Hence it is assumed that once society reaches a certain level of economic development, it will invest in environmentally friendly technologies and change the structure of production in order to reduce environmental impacts.[50]

The claims of developing countries for attaining growth are compatible with the EKC hypothesis and in line with the ecological modernization. The environmental Kuznets curve is not comprehensive enough to explain environmental degradation over the globe. Hence, the EKC applies more to local pollution issues like urban air quality and freshwater pollutants rather than global degradations such as greenhouse emissions.[51] There is much more explicit link between cause and remedy in local issues.

Active regulation and abatement are deployed once environment has been deteriorated so that a larger capital stock has depressed its social value relative to that of environment. However,

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[48] Debra Johnson and Colin Turner, *"International Business Themes and Issues in the Modern Global Economy",* Routledge, London, 2003.
[49] Elisabetta Magnani, "The Environmental Kuznets Curve, Environmental Protection Policy and Income Distribution", *Ecological Economics,* 2000, No.32, pp: 431–443.
[50] i*bid.,*p.439.
[51] i*bid.,*p.440.

the declining part of the EKC corresponds to an over-rising pollution abatement cost share that may be unacceptable because of the imposed drag on growth.

2.1.5. Globalization, Sustainable Development and Environmental Policy

Development policy, environmental protection policy and climate policy have their own history and tradition while interconnection among these can not be ignored. The environment and development are completely interdependent phenomenon that we can't have one without the other. Globalization process of the post-World War II can not be considered sustainable. Environmental activists consider globalization, development, growth and environmental quality incompatible. Hence, globalization has been recognized as the cause of environmental degradation.

By increasing the production, consumption and trade flows, the globalization has been held responsible for an accelerated rundown of the natural resources and environmental degradation. Competition is intensified due to primacy of market forces fostered by globalization and the accompanying deregulation and liberalization. In the rising global competition arena the firms and the states approached environmental considerations as a "luxury".

The main concern of environmental policy is conservation of the environment, while the main concern of economics is the efficient allocation of scarce goods and resources. Economics theory looks for the most efficient way, namely "Pareto optimum", which is a situation where no economic actor can be better off without making other actor worse off. What is better or worse is a function of the goals pursued by the relevant actors. In matters of environmental policy, a precise determination of Pareto optimum requires a quantification of costs for each actor, which is called external costs.

In the case of internalization of external costs, in which the external costs are reflected in the price of a product, a production damaging the environment would decrease to the Pareto-optima level.[52] This is the underlying rationale of the "polluter-pays-principle". Therefore, the issue is how to ensure that if these external costs are reflected in the price, and how to

[52] Nicholas de Sadeleer, *"Environmental Principles",* Oxford University Press, Oxford, 2002, p.21. See also Manfred Kemper, „*Das Umweltproblem in der Marktwirtschaft"*, 1989, p.10.

quantify these costs. For example, extinction of species can not have a cost to remedy. Even if there is no economic use of species, this is still an environmental damage. However, economic considerations should be taken into account while pursuing environmental goals. On the other hand, preserving the natural life support system is an absolute economic interest. Therefore, it can be claimed that the preservation of environment is also an economic goal.

Until the couple of last decades, globalization and environmental quality has been considered incompatible. Through production, consumption and trade activities, the globalization is held responsible for accelerated damage of environmental values. The developed countries have reached a certain level of economic and social welfare through the market economy and industrial development. However, now they are afraid to loose the comfort they have now, due to the environmental degradation at the expense of their industrial and economic development. Therefore, the developed countries, particularly the EU, impose environmental regulations. However, the developing countries and firms consider these regulations as burden for their business, interest and competitiveness. Due to the globalization, the firms, which try to avoid the cost of environmental standards move to the countries with lower standards and costs, which are named "pollution havens". Therefore, the "dirty industries" tend to move rapidly from developed to the less developed countries, so that the environmental degradation accelerates globally. This depends on the assumption that, environmental compliance costs are sufficiently high to be a determining factor of business plans and accommodation. However, even for the most polluting industries, environmentally compliance costs are no more that 2 % of the total costs.[53]

If profit margins are tight and economic environment is generally unfavorable, the additional costs of environmental regulations could be determining for the relocation. However, the analysis of trade and foreign direct investment patterns does not indicate a relative shift of dirty industries from developed to developing countries. According to Heckscher-Ohlin principle of neo-classical trade theory, differences in capital and labor, determine the trade patterns. Therefore, capital-intensive industries are attracted to developed countries while the labor-intensive industries are attracted to the developing countries.[54]

[53] Debra Johson, *"Ecological Modernization, Globalization and Europeanization: A Mutually-reinforcing Nexus?"*, *op. cit.*, p.154.
[54] Debra Johnson, Colin Turner, *op. cit.*, p.34.

Since the end of the 20th century the concept of ecological crisis started to occupy the public agenda through scientific reports and intergovernmental efforts. In the contemporary world politics, environmental degradation is considered as one of the greatest long-term threats to economic growth. Over the long term, prevention of environmental damage is cheaper than dealing with the effects of environmental damage. As Benjamin Franklin said "an ounce of prevention is worth a pound of cure." Climate change is the most obvious example of this reality as the former Chief Economist of the World Bank, Nicholas Stern, indicates in his report is that the benefits of strong and early action far outweigh the costs of doing nothing.[55]

Based on the traditional economic models, Stern estimated that the costs of tackling climate change by reducing the amount of greenhouse gases and helping vulnerable communities to adapt to the impacts of climate change would account around 1% of global GDP. On the other hand, he estimated the cost of inaction and carrying on business as usual, the overall costs and risks of climate change will be equivalent to losing at least 5% of global GDP each year, now and forever. When a wider range of risks and impacts are taken into account, the estimates of damage could rise to as much as 20 % of global GDP.[56]

In economic terms, environment and development are not rivals; rather there are numerous synergies between them. Environmentally sound business practices lead to development and growth opportunities, namely the win-win outcomes. For instance, 80 % of the European fish stocks are overexploited because of lobbying for higher quotas, so that domestic fishing industry has disappeared in Europe. On the other hand, China catches the fastest rates of growth and poverty reduction over the last three decades at the expense of environment. Responding to growing demand of energy, China installs a new coal-fired power station every week, but it faces in return serious acid rain, smog and water pollution. The World Bank estimates that 750,000 people die prematurely every year in China as a result of water and air pollution, which cost to country US $100 billion a year. The Chinese government declares that environmental degradation cost 3% to 5% of Chinese GDP every year.[57]

[55] Nicholas Stern, "*Stern Review on The Economics of Climate Change*", Cambridge University Press, 2007.
[56] *Ibid*, p.4.
[57] The Economist, "*A Large Black Cloud, Rapid Growth is Exacting a Heavy Environmental Price"*, March 2008
http://www.economist.com/specialreports/displaystory.cfm?story_id=10795813

In the frame of sustainable development, good environmental management is about increasing the efficiency of utilized resources, which in turn is good for business leading economic growth and development. For instance, the recycling of aluminum uses 95 % less energy than its original production. Already the recycling of aluminum avoids 80 million tones of greenhouse gas emissions per year.[58] In addition, environmental management and regulation encourages innovation and research and development. For instance, due to the works on renewable energy technologies, Germany has become a world leader in the development of wind turbines and solar panels, so that the German solar panel sector costs €5 billion.[59]

There are different approaches in respect to the environmental protection and sustainable development. According to the one view, 'limits to growth' should be essence of all environmental considerations while another approach claims that economic growth and environmental protection can be achieved at the same time and they are necessarily not mutually exclusive.

The links between environmental, social and economic concerns are particularly clear in developing countries, where poverty is both the result and reason of environmental degradation. In 1994, the United Nations put this issue as following; "The environment, like the peace, economy, society and democracy, permeates all aspects of development, and has an impact on countries at all levels of development. In the developing world, ecological pressure threatens to undermine long term development."[60]

The developing world does not want to have the burden of environmental protection. Their priority is development and they do not want to bother this trend by extra costs of environmental regulations. Significantly, they argue that the developed countries and their policies since the early stage of their development are responsible for the current environmental problems, so that the developed countries must pay the burden.

In our age, it seems that sustainable economic growth could be boosted in two ways; namely technological progress orientated towards a growing environmental compatibility of products and production processes; and consumer preferences privilege products and services linked to

[58] See http://savingenergy.wordpress.com/2006/12/18/saving-energyone-aluminum-can-at-a-time/
[59] See http://www.german-renewable-energy.com/Renewables/Navigation/Englisch/solar-power.html
[60] UN, *"An Agenda for Development Report of the Secretary-General",* A/48/935, 6 May 1994, Available at: http://www.un.org/Docs/SG/agdev.html

better environmental quality.[61] These two aspects improve slowly and this can be accelerated by environmental policy measures.

2. 2. International Cooperation for Sustainable Development and Environmental Protection

2.2.1. International Cooperation and Institutionalization: Neorealism and Neoliberal Institutionalism

World politics and international relations of the 20th century have been dominated by theories idealism, realism, liberalism and neorealism. In the highly globalized world of the 21st century, only one theory is not capable of explaining the developments in the world politics and international relations. Every theory contains its own strengths and weaknesses so that theories complement each other. Therefore, the current issues, such as global economic crisis, epidemic diseases, international terrorism and security issues, environmental issues and global climate change, require international cooperation. In this respect, neorealism and neoliberal institutionalism should be examined in order to understand world politics of sustainable development, environmental protection and addressing climate change. Neorealism and neoliberal institutionalism have been the major theories in understanding world politics and international relations. The evolution of complex international cooperation concerning the environmental policies, particularly the climate change, can be better explained by the neoliberal institutionalist theory that provides better explanations for the latest global developments concerning climate change. Through this theory, it becomes possible to examine the role played by international institutions bringing states together and cooperating for climate change. It shows that under mutual interests, states have been able to cooperate through international institutions.

The realist school claims that the states' primary concern is their own security so they look for relative gains and ignore cooperation. According to the realists, cooperation is limited in an anarchic world, where the states always seek their own national interests and want to gain more than other states. In that sense, international organizations are not capable of creating cooperative relations among the states in a self-help order. However, the states will be willing

[61] Alessandro Vercelli, "*Globalization and Sustainable Development*", *op. cit.*, p.10.

to share their foreign policy sovereignty, if the gains of a common position worth sacrificing their foreign policy sovereignty.[62]

The realist considers the environmental issues within the outlook of environmental security. Actually, the term 'environmental security' has been used to attract the attention of states and to put the issue on the global political agenda. Hence, the environmental problems are acknowledged and treated within the scope of existing security notions of the realists. Environmental degradation as well as misuse, scarcity of natural resources, such as water and oil has caused several interstate wars throughout the history. According to the realists/neorealists schools, environmental circumstances and geographical location of a state affects political behavior. Environmental factors are also important for the idealist/neoliberal institutitonalists, nevertheless they rely on international organizations to "alter human behavior by changing the international political environment."[63]

The state-centric and power-oriented realist explanations can not explain the evolution of current international politics and cooperation in environmental issues. During the détente[64] in the 1970s, economic, social and ecological issues in respect to interdependency[65] have been discussed at the international arena. Neorealism is based on the main realist assumptions that the states are the major actors on the international scene acting in an anarchic environment where each state tries to achieve its own national interest at the expense of the others.

The neorealist approach basis its assumptions on the existence of hegoman and balance of power. However, in the current international cooperation in sustainable development and environmental protection, particularly the climate change, it is difficult to focus on only one hegoman since many national and international actors play different roles. While not ignoring the fact that power plays a role, we should consider that besides the "big players" including the US, EU, Russia and China, the less powerful states have also been influential in

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[62] Karen Smith E., "*European Union Foreign Policy in a Changing World*", Polity Press: Cambridge, 2003, p.4.
[63] Dougherty, James E. & Robert L. Pfaltzgraff, "*Contending Theories of International Relations: A Comprehensive Survey*", Addison-Wesley Educational Publishers Inc., New York, 1996, pp. 148-149.
[64] This term is used in 1970s international politic in reference to the reduction of the tension between the Soviet Union and the United States, which have been the dominating powers of the Cold War form 1960s until the 1980s.
[65] The approach of interdependence is based on idealist/liberal theories. Accordingly, societies are connected through multiple interstate, trans-governmental and transnational channels. While the interstate relations are governed by multiple issues, the military issues started to loose its dominance on world politics. Therefore, military force started to loose its importance since it is not able to resolve economic disputes in the interdependent international arena and it is not used against those states where interdependence exists.

manipulating the direction of the negotiations. In this respect, the term 'influence' can be preferred to 'power', which is coercive and leads to involuntary submission. On the other hand, influence is persuasive and leads to voluntary submission.[66]

The aforementioned realist assumptions about the limitations of the international institutions in creating a cooperative environment have been challenged by the rise of globalization and the increasing interdependence between the states. The approach of intergovernmentalists differs from the legacy of realism in that respect. They argue that despite the fact that international organizations are 'means of pursuing state interests, through bargaining', they admit the role of these organizations in overcoming the limits of cooperation. It is clear that globalization and interdependency create internal and external pressures and challenges to the state-centric international system. [67]

The neoliberal institutionalism has adopted the key assumptions of realism; hence it is a synthesis of realism and liberalism. As the defender of neoliberal institutionalism, Keohane acknowledges that realism is a necessary component of understanding world politics due to its emphasis on power and rationality.[68] Nevertheless, in contrast to realists, they emphasize on the importance of international institutions. The neoliberals consider the states as "rational egoists" who work to reach their own goals and maximize their absolute gains. According to them, the anarchical nature of the international system can reinforce states to cooperate with the aim of reaching their goals and preserving their well-being. However, the precondition of this cooperation is the presence of interdependent or common interests. The states tend to cooperate if they believe that they will gain from the cooperation. Hence, unless states gain more by blocking cooperation, they do not cooperate, as in the case of the blockage of the US the Kyoto Process in 1990s. The neoliberals favor international regimes and institutions, which are considered effective in reshaping the interests of the states. Hence, international institutions are important tools to promote and protect cooperation, which in turn brings stability to the system.[69]

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[66] Peter Newell, "*Climate for Change: Non-state Actors and the Global Politics of the Greenhouse Gases",* Cambridge University Press, USA, 2000, p.34.
[67] Karen Smith, *op.cit*. pp.4-6.
[68] Robert Keohane, "Theory and World politics: Structural Realism and Beyond" in Robert O. Keohane *(ed) Neorealism and Its Critics,* New York, Columbia University Press, 1986, p.159.
[69] Robert Keohane, "Institutional Theory and the Realist Challenge After the Cold War*.",* in David A. Baldwin (ed) *Neorealism and Neoliberalism: The Contemporary Debate,* New York, Columbia University Press, 1993, pp:273-275.

Despite the fact that states are still the leading actors in the climate change politics, increasing numbers of transnational actors influence the politics. Since 1990s international regimes, which were dominated by state-centrism, started to move towards global governance. In this respect, the neoliberal institutionalists consider the global civil society as a key institution.[70] They claim that global governance is possible in the absence of a world government while the realists assess that a world government should exist to achieve governance at the global level, however, they see it to be very hard.[71] Nevertheless, environmental groups increasingly have an important role in influencing state policies and establishing transnational civil society.

Neorealists consider international cooperation possible but exceptional while the neoliberal institutionalists think that the international system already has practices of cooperation since it provides a ground for the states to work for their interests and goals. Indeed, in the 20th century there have been various international cooperation and institutions including the League of Nations and later the United Nations, the Bretton Woods system (1944), the Treaty on Antarctica (1959), the GATT and the WTO. The diverse approaches in respect to international cooperation stem from the different perception of total gains. The neorealists underline importance of relative gains, namely distribution of power while the neorealists seek for the absolute gains. In this respect, for the neorealists international politics is a zero-sum game, in which positive developments for one country mean negative development for the others in respect to the balance of power.[72] Hence, they are cautious to international cooperation. According to the realist school of thought, international institutions ignore the collective outcomes and they adjust to changes very slowly.

According to the neoliberal institutionalists, cooperation can be enhanced if mutual interests dominate, long-term future goals exist and the number of participants is small. Concerning environmental issues, particularly the global climate change, countries tend to cooperate not to suffer in the long term. However, the uncertainty on who will face what constitutes a challenge for effective cooperation and burden sharing.

[70] Ian Rowlands, "Classical Theories of International Relations" in Urs Luterbacher & Detlef F. Sprinz. (Eds.) *International Relations and the Global Climate Change, t*he MIT Press, Massachusetts, 2001, p.63
[71] Matthew Paterson, "*Understanding Global Environmental Politics: Domination, Accumulation, Resistance",* MacMillan Press Ltd, Great Britain, 2000, p.25.
[72] Matthew Paterson, "*Global Warming and Global Politics",* Routledge, London, 1996, p.118.

In the evolution of the cooperation in environmental issues, policy formulation is effected by non-state actors like international institutions besides the states as the major decision makers, nongovernmental organizations, epistemic communities and other interest groups. Nevertheless, the nation-states are the primary actors in the management of environmental issues, thereby shaping the international environmental politics. Only states can negotiate agreements, can be parties to them while being responsible for implementation and enforcement of those defined rules and norms. They can have a leading role for establishment of new environmental regimes and they can hinder the cooperative actions.[73]

Together with the nation-states, international organizations (IOs) and non-governmental organizations (NGOs) have been playing important role in environmental problems, which have grown after the Second World War. These actors are shaping the global environmental politics along with the nation states. The IO's set agenda for global action, introduce the issues, coordinate scientific research and evidence, disseminating this information, influence negotiations and state policies, and develop code of conducts. The NGOs can mobilize public and affect decision-making, lobby international negotiations, monitor implementation of conventions, influence global agenda and propose texts of conventions. Even though the NGOs are not involved at the decision-making process, they can influence outcomes of the global bargaining as well. There are also multilateral financial institutions and multinational companies, which affect the global environmental politics. Multilateral financial institutions can contribute to realization of environmentally sound projects.[74] Consequently, state-centric realist explanations are not sufficient in explaining the evolution and the development of the cooperation in environmental issues, particularly the climate change.

In the issue of climate change, one of the most successful example is the International Panel on Climate Change (IPCC), which provides scientific analysis and knowledge in the issue of global climate change so that promotes the states and international community to develop climate policies in the frame of UNFCCC.[75] Accordingly, the scientists and scientific knowledge are indispensable for the analysis of international reality. New information that disseminated by epistemic communities may lead to new behavior and even enhanced

[73] John McCormick, "The Role of Environmental NGOs in International Regimes", in Norman. J. Vig and Regina .S. Axelrod (eds.), *The Global Environment: Institutions, Law and Policy*, Congressional Quarterly, USA, 1999, p.55.
[74] Gareth Porter and Janet W. Brown, "*Global Environmental Politics*", USA: Westview Press, 1996, p.41.
[75] International Panel on Climate Change (IPCC), 2007. This issue will be further examined in the following chapter.

cooperation in regional and global level. International institutions are vital elements for the spread of knowledge to new policies in international cooperation. Hence, epistemist community theory complements the neoliberal institutionalist theory in its explanations of international cooperation in environmental issues.

The epistemic community theory was introduced by Peter M. Haas. It underlines the importance of knowledge and cognitive processes related to international cooperation and regimes. Epistemic communities are defined as "transnational networks of knowledge based communities that are both politically empowered through their claims to exercise authoritative knowledge and motivated by shared causal and principled beliefs."[76] Through scientific research, they decrease the level of uncertainty in many global environmental issues and distribute knowledge among the states and the international community so that they serve to international cooperation.

2.2.2. Internationalization of Environmental Policy

The environmental problems, like the climate change, ozone depletion and acid rain, have increased the public attention concerning the management of global commons for which collective action is necessary at the international level. However, in the absence of the world government, more than 190 nation-states claim sovereignty over the resources and activities within their territories, thereby having the exclusive authority within their territorial boundaries. Today environment is one of the significant issues of international politics due to increase in the number and scope of environmental problems, rise in the scientific understanding of the global environmental issues and evolution of environmental movements in many of countries. However, the management of environment is very complicated and complex due to the increasing number of actors involved in the process as well as the specific features of the environment and the character of international legal order.

In the last decades, cross-border industrial pollution, degradation of shared rivers, pollution of adjacent rivers have become apparent and number and scope of transboundary environmental problems have increased and globalized. Therefore, territorial boundaries of the states are eroded by those problems since acid rain or greenhouse gases recognize no frontiers. This is a

[76] Peter Haas, "Knowledge, Power and International Policy Coordination", *Special Issue of International Organization,* 1992. p.3

challenge for the nation-state system. No nation can shield itself from diverse impacts of environmental degradation in other territories. Even if states are economically strong, technologically advanced and militarily powerful, they cannot isolate themselves from many environmental problems. There are global environmental problems to which all nations contribute and by which all will be affected. Hence, only unilateral actions of the nation-states cannot address increasing number of transboundary environmental problems.

In the absence of a global authority to manage the interdependent ecosystem, nation states had involved in cooperative activities to manage their environment before 1970s. After early 1970s, the attention of the governments and other stakeholders are attracted to the seriousness of the environmental degradation in the world, so that the environment has become the subject of international politics and an important issue to be dealt in cooperation and collaboration with all states.

Since 1970s, international collaboration is encouraged to solve global environmental problems in an international system of sovereign states with defined boundaries. Despite the ecological interdependence versus state sovereignty dilemma, there have been cooperative efforts between nation-states in order to address common environmental problems and to manage the ecosystem, which cannot be addressed by unilateral action. Over time, international cooperation in the field of environment has accelerated and this led to establishment of a large number of environmental regimes.

There is a considerable difficulty in identification of the environmental problems, responsible actors and the degree of their relevance as well as the costs of alternative policy responses. Due to the complexity of natural systems, scientists have great difficulty in sorting out which actions account for which outcomes. A range of human activity might contribute to a certain environmental problem. Scientific uncertainty constitutes one of the internal components of environmental challenges. Reliable data and empirical knowledge are essential for policy-makers and also for international cooperation.[77] Due to the uncertainty and dynamism of environmental issues, environmental agreements are arranged in a flexible manner in order to adapt itself to these changes. The rigid and detailed sets of rules are not preferred in the

[77] Marc Williams, "Knowledge and Global Environmental Policy" in Peter Dauvergne (ed) *Handbook of Global Environmental Politics*, 2005, pp: 402-416.

environmental policy-making; instead multilateral rule-making frameworks are set in flexible frameworks to be able to respond to these changes.

Internationalization of economy reinforces also internationalization of ecological systems. Interdependency of the ecosystem is the other feature of environment. Neither the oceans, nor the atmosphere have boundaries. This ecological interdependence poses a fundamental challenge to the existing international legal order with more than 190 nation-states that each claiming sovereignty over its territory and natural resources and, is free to act within its national jurisdiction. However, the components of environment including land, air and water are interdependent. In this regard, the management of environment necessitates an integrated and collaborative approach.[78] The contribution of countries to a specific problem and benefits to be obtained by a regulation changes from one country to another. The country that has the highest level of contribution to the problem might be the one who will not be benefiting from the policy responses, therefore will be reluctant to participate in a cooperative action. On the other hand, the country that does not contribute to the problem might be the one who will benefit more room the cooperative policy actions for the solution of that particular environmental problem.

The UN has been the most comprehensive ground for international cooperation also in environmental policies since 1970s. In addition, among all the actors the European Union has been a dominant actor and a ground of cooperation for its members by linking the domestic and international environmental policy making. Apart from developing its own environment policy and legislation, the EU also has been party to many international agreements on environment. Hence, by supporting the sustainability of the internal market and protection of the environment, the EU has a leading and bridging role in international environmental protection and promoting sustainable development.

The issue of climate change is one of the main spheres of international cooperation in environmental issues. Despite it failures, it is an example of interdependencies of environmental issues. The main obstacles to global climate regime are limited political will in key countries and different interests of developed and developing countries. Limited political will is generally related to the long-term perspective and scientifically uncertain character of

[78] Alexandre Kiss and Dinah Shelton, *"International Environmental Law"*, Graham and Trotman, Ardsley-on-Hudson, N.Y., Transnational Publishers, London, 1991, p.4.

the climate change as well as the different costs and vulnerabilities of the countries. Moreover, high level of dependence of the states on fossil fuels increases the costs of shifting to the new and renewable energy resources. The states generally do not have financing and technological capacity to cover these costs. In addition, different interests of the states constitute a challenge in the case of climate change. For example, Kyoto architecture is rather rigid by allowing only a single emission type, fixed and absolute emission targets. The new global climate regime for post-2012 should provide more flexible architecture that can be acceptable for broader range of states. Flexibility is essential since the states have different economic and social circumstances in terms of resource endowment, economic structure, fuel mix, mitigation potential, regulatory traditions and capacities. Moreover, states have different levels of responsibility and capacity. Consequently, same types of actions don't make sense for all countries.

2.2.3. Common Good: Governing the Atmosphere

Global commons or common goods are presented as the natural systems and resources including the atmosphere, outer space and the oceans that belong to all humans rather than individual nations. Being limited in their amounts they are finite and subtractive, namely when a part is consumed by one actor, that part is no longer available to the others. Preservation of the global commons is indispensable for the life on earth. Being one of global commons, the atmosphere is beyond the jurisdiction of all states because nobody can "take the possession of the gases".[79] Moreover, the atmosphere is a collective good since every individual has access to it. Indeed, the atmosphere has been considered as a global sink resource since humans freely dispose all their pollutants into it.

Biermann defines governance as "new forms of regulation that differ from traditional hierarchical state activity and implies some form of self-regulation by societal actors, private-public cooperation in solving of societal problems, and new forms of multi-level policy."[80] In this framework he claims that the 'earth system governance' differs from the concepts of 'good governance', 'corporate governance', and any sort of geo-engineering. Accordingly, being similar concept to 'global governance', the 'earth system governance' welcomes

[79] Marvin Soroos, "Garret Hardin and Tragedies of Global Commons" in Peter Dauvergne (ed.) *Handbook of Global Environmental Politics*, Edward Elgar, Cheltenham, 2005, p.40.
[80] Frank Biermann, "Earth System Governance. The Challenge for Social Science*", Global Governance Working Paper*, No:19*,* Amsterdam, 2006 p.5.

participation of public and private non-state actors at all levels of decision-making, ranging from networks of experts, environmentalists and multinational corporations to new agencies set up by governments, such as inter-governmental bureaucracies. It promotes "co-evolution of human and natural systems in a way that secures the sustainable development of human society."[81]

Moreover, the earth system governance is also differentiated from 'earth system management', which is considered as a normative, infeasible and undesirable concept. Some consider global governance as an attempt to limit the freedom of action of powerful states. The global climate regime under the auspices of the UNFCCC is an example in this respect since it is generally dominated by the powerful states. According to Vogler, environmental governance means the establishment of common property regimes for the global commons.[82]

The capacity of the atmosphere to absorb GHG emissions is limited, which means that once this capacity is over, it cannot absorb the remaining emissions.[83] The main concepts of world politics and international relations such as power, authority, sovereignty, public administration, policy programs, and interest groups started to be replaced by interactive planning, network management, stakeholder dialogue, deliberative democracy, complexity, interdependence, policy discourses, and governance in the recent decades. The states seek to find a way out and create an international order in the new era in which new actor like China and India started to dominate the world politic, besides the US, Russia and the EU, while the economic and environmental crisis, especially climate change, present the ever greatest challenges.

The global character of the environmental problems, particularly climate change, increases the interdependency, thereby necessitates cooperation between all nation-states, since no nation can escape from adverse impacts of environmental problems regardless of its economic or military capacities. Since there is no supranational authority to manage global environmental problems, cooperation among nation-states appears as the key solution in a world of sovereign nation states.

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[81] *Ibid*, *,p.6-7*.
[82] John Vogler, "Studying the Global Commons: Governance Without Politics?" in Peter Dauvergne (ed) *Handbook of Global environmental Politics*, 2005, p.53.
[83] Marvin Soroos, *op. cit*., p.38-40.

2.3.4. Constructivists Explanations of International Cooperation and Prisoner's Dilemma

As the prominent defender of the neoliberal institutional theory Keohane developed the rational choice model in order to underline the importance of institutions and cooperation in international arena. Rational choice institutionalism tries to explain collective choices of rational actors as a result of the interaction between actor preferences and institutional rules. In this respect, actors choose institutions rationally and perceive the rules to facilitate the ursuit of their goals. On the other hand, the reflectivist (constructivist) school perceives states "as playing roles and trying, inter-subjectively, to develop norms and a sense of their interests".[84] Hence, the reflectivists consider the states as role players, which are reflexive about their goals. Keohane argues that rational-choice institutionalism "insist that institutions must reflect bargaining equilibrium of games in which actors seek to pursue their own interests as they define them".[85]

International cooperation is indispensable for the governance of global commons. There are several challenges in front of the collective action and international cooperation in environmental protection and combat against climate change. Since states are unitary actors and rational utility maximizers, global environmental policies are formulated in the framework of power and domination. Despite the concepts of collective governance and stakeholder dialogue of the new-age, environmental policymaking contains the concepts of power and control. Moreover, each state has and individual incentive to pollute.

International cooperation in environmental issues can be hindered also by non-action, cheating and free-riding. The uncertainty factor plays vital role due to the scientific uncertainty concerning the possible effects and the address, namely the question of who will be affected. Hence, the international cooperation and institutional framework should be formulated in a way eliminating free-riding. This can be succeeded only by the establishment of trust among the members that the parties will not cheat or free-ride, while setting threats of retaliation. In this framework, cooperation can be developed as in the situation of "Prisoner's

[84] Matthew Paterson, "*Global Warming and Global Politics",* Routledge, London, 1996, p.131.
[85] Robert Keohane, "Governance in a Partially Globalized World: Presidential Address, American Political Science Association", *American Political Science Review*, Vol.95, No.1, March, 2001, p.4

Dillemma"[86] which is a detrimental equilibrium. States face "prisoner's dilemma" so cheat as long as they do not trust each other. If each state pollutes, leaves everyone worse off while cooperative outcome leaves everyone better off, but it is difficult to organize and enforce.

The states try to escape from mutual responsibilities in the collective action due to the uncertainty on who will face what.[87] Therefore, it is important to establish a system of trust and enforcement mechanisms through binding international agreements.

[86] Two prisoners have committed a crime together. They are separated from each other and are questioned in separate cells. They cannot communicate. Under the circumstance that if one prisoner confesses, he will be sentenced for 1 year in prison, the other will get 10 years of prison. If both confess, each of them will stay 5 years in prison. If both deny, both will stay 60 days in prison. No matter what the second prisoner chooses, it is always better for the first prisoner to confess and vice versa. If the first prisoner denies, the second can confess and end up with one year, however, the first one gets ten years. If the first prisoner confesses, and the second prisoner will confess too they will end up with 5 years in prison. Therefore, according to the prisoner's dilemma, both prisoners will make the same calculation and choose to confess and end up either by 5 years of prison or 1 year. If they had the chance of cooperation by communicating, then they would agree to deny and end up by 60 days each instead of 5 years. See James Dougherty and Robert Pfaltzgraff *op.cit.* p.509.

[87] Urs Luterbacher and Detlef Sprinz, "Conclusions" in Urs Luterbacher & Detlef F. Sprinz (eds) , *International Relations and Global Climate Chang,* MIT Press, Massachusetts, 2001, p13-15.

III. THE UN'S WORLDWIDE SUSTAINABLE DEVELOPMENT

3.1. Early Steps of International Cooperation for Sustainable Development and Environmental Protection

3.1.1. Stockholm Conference

The issue of sustainable development and environment was neither a central issue in international politics, nor an area for a broader co-operation in international system. Hence, environmental issues were fragmented, limited and decentralized. After the establishment of the UN in 1945, the cooperation at international level started to accelerate by adoption of several multilateral environmental treaties. However, they were limited both in scope and number while mainly focusing on narrowly defined ecological problems such as prevention of certain types of pollution, in particular maritime pollution and conservation of specific species.

The surge for environmental concern to be solved at international level first came from the developed world. Upon the proposal of Sweden, the UN Conference on Human Environment was held in Stockholm in June 1972. This has been the beginning of a new era in terms of legitimization of the environmental issues in the international politics.[88] The Conference led to a shift from the view of an 'unlimited earth', which is created for man's exclusive use, to a view of the earth as a domain of life, in which mankind is temporary. The conference raised the issue of environment as a study area in international relations as well as opened the way for broader cooperation at the international level in solving environmental problems.

The Stockholm Conference was the first global gathering with the participation of 1200 delegates from 114 countries and more than 400 NGOs and IGOs that addressed specifically the environmental problems with a view to solve them through cooperation and agreement at the international level.[89] Thus it was a breakthrough in development and nature relationship. It represented the dawn of an era in which mainstream politics attend to environmental issues, as

[88] Lynton Caldwell, *"International Environmental Policy: From the Twentieth to the Twenty-First Century"*, London, Duke University Press, 1996, p.78.
[89] Lorraine Elliott, *"The Global Politics of the Environment"*, London: Macmillan Press, 1998, p.12.

well as a process of professional approach to environmental concerns.[90] The main outcome of the summit was creation of the United Nations Environment Program (UNEP) to catalyze, initiate and coordinate environmental policies throughout the international institutional system. Moreover, for the first time an international aid agency, the World Bank, declared that environmental and development goals could be complementary.[91]

The Conference was dominated by the disagreement between the North and the South, in which the links between the prevailing international economic system, environmental degradation and poverty have been highlighted. In addition to these concerns, growing population levels of the developing countries have drawn the attention of the developed countries. The Stockholm Conference was the first international conference that warned the people and politicians about various unintended and unplanned results of human activities on nature. Nevertheless, in the Post Cold War era, international security concerns, financial crises, economic recession and the pressure of the increasing population on the natural sources dominated the concerns on environment-development link.

Although the Stockholm Conference could not respond to the environmental problems of developed world and the demands of the developing world, it placed the environment as a whole on the UN's agenda and into the international environmental politics. In this regard, the Conference is considered as a watershed in the history of international environmental politics. It provided a forum for the countries to debate over "environment" and helped the development of international environmental policy and law.[92] Furthermore, it changed the previous perception of environmental issues and restrictive concepts of national sovereignty. Even though the Stockholm Conference didn't end up with binding treaties, it lead to three soft law instruments including the "Action Plan for the Human Environment" setting forth 109 recommendations, the Declaration of the UN Conference on the Human Environment (Stockholm Declaration) with 26 Guiding Principles and a Resolution on Institutional and Financial Arrangements. These instruments are significant since today they are the most important sources of soft international environmental law. The declaration was a kind of compromise including recommendations relating to human settlements, resource

[90] Andrew Jamison, *op.cit*. 17-40.
[91] Young, Z., *"A New Green Order?: The World Bank and the Politics of the Global Environment Facility",* Pluto Press, London, 2002.
[92] Lorraine Elliott, *op.cit.* p.13.

management, pollution, development and the social dimensions of the impact of environmental degradation.

The ten-year review of the Stockholm Conference did not come up with promising results about the actions taken by the states. In order to look for possible ways for the international community to take bigger steps towards environmental protection, the World Commission on Environment and Development was established in 1983. The Commission published the Brundtland Report "Our Common Future", one of the most significant documents related to environmental issues. The Brundtland Report, for the first time, called for "sustainable development" upon which the second important global gathering, UN Conference on Environment and Development (Rio Conference), was based. The Brundtland Report is notable for recognizing the poverty and underdevelopment in developing countries. It was argued that environmental protection can be possible if the poverty is eradicated through sustainable economic growth and the gap between rich and poor countries in consumption of earth's limited resources are reduced.

3.1.2. Towards Sustainable Development: "Our Common Future"

In 1983, an independent group of 22 people from UN member states of the developing and developed world identified the long-term environmental strategies for the international community. Their report entitled "Our Common Future" was published in 1987 at the World Conference on Environment. This report is known as the "Brundtland Report", after its chair, the then Prime Minister of Norway, Gro Harlem Brundtland. The report widely referred to the term "sustainable development" and defined it as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".[93] Since then "sustainable development" has been placed firmly into the political arena of international development thinking.

The idea and concept of sustainable development as defined by the World Commission on Environment and Development (WCED) and the report *Our Common Future* focuses on two main issues. Firstly, in the long term, it highlights to fulfill mankind's basic needs, which is defined as a requirement for a life in dignity. Secondly, it supports a socio-economic growth

[93] WCED, World Commission on Environment and Development*, "Our Common Future"*, Oxford University Press, United Kingdom, 1987, p. 43.

in harmony with the ecosystem in order to ensure stable development over a long term. Hence, the WCED identifies three interdependent pillars of sustainable development: economic growth, sociologic development and environmental protection.

WCED Report was global recognition of a reality that humans are changing planetary systems fundamentally and it represented an international consciousness to find a way to manage that. In this respect, it stated that "the time has come to break out of past patterns. Attempt to maintain social and ecological stability through old approaches to development and environmental protection will increase instability".[94]

The concept of sustainable development supports strong economic and social development, in particular for people with a low standard of living. While underlining the importance of protecting the natural resource base and the environment, the concept of sustainable development claims that economic and social well-being cannot be improved with measures that destroy the environment. Intergenerational solidarity is crucial since development policies have to take into account its impact on the opportunities and challenges for future generations.

The first important outcome of the WCED report was presentation of environmental concerns in a way that it could draw attention of strong institutions like the World Bank and the IMF. Second outcome was promotion of the notion of sustainable development. Contradictorily, these two achievements of the report were also used to criticize the Brundtland approach. Radical critics of the Brundtland Report claim that the whole idea of sustainable development is a rhetorical maneuver, which conceals a strategy for sustaining development rather than addressing the causes of ecological crisis.

The report stresses that essential needs of people in developing countries are not being met and claims that the world will always face ecological and economic crises.[95] The report suggests to the developed countries to recognize the right to development of the developing countries. According to the Principle 3 of the Report, "the right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations". In line with the right to development, the Commission called for the importance of "environmentally-sound" technologies in order to ensure that developing countries could

[94] *ibid,* p.22.
[95] WCED, *"Our Common Future"*, *op.cit*., p.44.

grow economically without destroying their environment. However, this point has been criticized since the attempt to buy these "environmentally sound" technologies has the risk of creating more environmental destruction because it will require the export of natural resources.[96]

According to Brundtland Report, the goals of economic and social development must be defined in terms of sustainability in all countries which, should share certain general features and should flow from a consensus on the basic concept of sustainable development and on a broad strategic framework for achieving it. Hence, development requires a progressive transformation of economy and society. Development policies have to pay attention to changes in access to resources and distribution of costs and benefits to achieve a secured physical sustainability. Physical sustainability requires equity between and within each generation.[97]

3.1.3. The Earth Summit and Agenda 21

Another turning point of the notion of international sustainable development and environmental policy is the United Nations Conference on Environment and Development, the "Earth Summit", which took place in 1992 in Rio de Janerio, Brazil. By that time, it was the ever largest international conference held, with over 170 governments' representators and further 2,500 NGOs and 8, 000 accredited journalists attending. For the first time, the heads of the states gathered to identify principles of an agenda for actions towards sustainable development. By this time, the term "sustainable development" gained a currency well beyond the confines of global environmental organizations".[98] Beside an emerging global consensus that sustainable development was an important policy objective and research subject, there was substantial debate on the meaning and practice of sustainable development. For twenty years the decisions of Stockholm Conference, were not followed, mostly due to the Cold War.

In Rio, there was a tension between the environmental concerns of rich and poor countries as well as between those who wished to exploit resources and those who wished to conserve

[96] Carlos Castro, "Sustainable Development: Mainstream and Critical Perspectives", *Organization & Environment*, June 2004, p.200.
[97] WCED, *"Our Common Future"*, *op.cit*., p.50-55.
[98] William Adams, *"Green Development"*, London: Routledge. 1990, p.2.

them, and between the development needs of currents or future generations. At the Rio Conference, the conflict was between the developed countries, called the "North" (North America, Europe and Japan) and the developing countries named as the "South" (Latin America, Africa and some Asian Countries). The North countries blamed the developing countries for their heavy dependence on natural resources; while on the other hand, the South countries accused industrialized countries for the environmental problems and defended themselves on the grounds of economical constraints. The Rio Conference paved the path to the solution since the world leaders agreed on a comprehensive strategy for sustainable development. The main outcomes of the Rio Conference were the adoption of two international environmental conventions, namely the Convention on Biodiversity (CBD) and United Nations Framework Convention on Climate Change (UNFCCC), as well as the Rio Declaration and the Agenda 21, which are extensive "soft law" instrument.

Rio Declaration on Environment and Development sets 27 guiding principles for national and international environmental policy to guide governments in sustainable development. Moreover, the declaration sets an objective for establishment of a "new and equitable global partnership through the creation of new levels of cooperation among states, key sectors of societies and people."[99]

In Rio Declaration, the principle of "sustainable development" appears in different contexts:[100]

> Principle 1: Human beings are at the centre of the concern for sustainable development.
>
> Principle 2: States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

[99] UNCED, "*Report of the United Nations Conference on Environment and Development"*, 1992. Available at: http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm

[100] See also http://www.unep.org/Documents.multilingual/Default.asp?DocumentID=78&ArticleID=1163

Principle 3: The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.

Principle 4: In order to achieve sustainable development, environmental protection shall constitute and integral part of the development process and cannot be considered in isolation form it.

In Rio, the UN member states adopted Agenda 21 Strategy based on the WCED definition of sustainable development. It was named as Agenda 21 since it targeted to make the development in the world sustainable by the beginning of the 21st century. Agenda 21 became a guideline for domestic plans and programmes UN as well as for international programmes and plans concerning sustainable development. The most of the UN Member States shaped their sustainable development policy referring to the Agenda 21 Strategy.

As defined by the WCED, sustainable development has a basic target to achieve the fulfillment of the human needs possible for present and future generations. The interpretation of Agenda 21 has focused on this target, which is considered very vague since it is unclear what the human needs are. Moreover, Agenda 21 contains many non-obligatory political measures to implement sustainable development on the national level. According to the WCED definition, the center of sustainable development is the human being with its needs. Due to the vague idea of human needs, interpretation of the concept of sustainable development differs. Broad and vague definitions of the WCED were also reflected at the Agenda 21, which contains various political measures spread over the forty chapters. Due to the number of the measures, it is difficult to identify basic prerequisites of human needs oriented development. Therefore, it is difficult to determine which measures are crucial for sustainable development. Another issue is that it is difficult to identify the basic prerequisites without a clear idea over the basic human needs and comparable requirements.

Agenda 21 defines the bases of the sustainable development as socio-economic development, environmental protection and good governance, which contain the principles of transparency, responsibility, accountability, participation and responsiveness to the needs of the people. Moreover, solidarity, cooperation, planning and the implementation are also vital in this respect. These fundamentals are acknowledged prerequisites of the sufficient implementation of the other measures.

One of the most prominent steps of the Rio Summit was the aspect of participation in the issue of sustainable development. While in the Stockholm Conference, decision making and implementation was under the responsibility of governments and international institutions, the Brundtland Report argued that the rebalancing the equality needed full participation of the citizens. The Rio Conference has gone one step further by stating that people should be trained in order to ensure their fully participation in both the decision making and the implementation processes.

3.1.3.1. The Pillars of Sustainable Development of Agenda 21

Three pillars of sustainable development are described by Agenda 21:[101]

• **Economic:** An economically sustainable system must be able to produce goods and services on a continuing basis, to maintain manageable levels of government and external debt, and to avoid extreme sectoral imbalances which damage agricultural or industrial production.

• **Environmental:** An environmentally sustainable system must maintain a stable resource base, avoiding over-exploitation of renewable resource systems or environmental sink functions, and depleting non-renewable resources only to the extent that investment is made in adequate substitutes. This includes maintenance of biodiversity, atmospheric stability, and other ecosystem functions not ordinarily classed as economic resources.

• **Social:** A socially sustainable system must achieve distributional equity, adequate provision of social services including health and education, gender equity, and political accountability and participation.

Agenda 21 provided more comprehensive and consistent ground for the approach of the UN in sustainable development. The Agenda 21 sets the first pillar of sustainable development ss

[101] UNEP, The United Nations Environment Programme, *"Agenda 21",* 1992 Available at: www.unep.org/documents/default.asp?documentID=52

economic growth or the production of goods and services. Accordingly, trade is recognized as the basis of domestic and international economics so international community should endeavor free international and domestic markets in order to realize a sustainable economy. In this respect, this requires non-discriminatory and transparent trading system, which is not restricted by export subsidies and protection of special sectors. Secure and predictable market is indispensable for this end so that economic relations must be guided by the principles of good governance, cooperation and planning. The interrelation between sustainable economy and good social environment, since governments and companies should invest in sociological projects and human capital.

Economic growth leads to social development and welfare by sustainable livelihood, eradication of poverty, employment and income generation. In this respect, social development is the second pillar of sustainable development. The last pillar is environmental protection, which is the basis of socio-economic development. According to Agenda 21, environmental protection means conservation, protection and management of natural resources. In this respect, it focused on the protection of the atmosphere, conservation of biological diversity, management of water resources and waste management. Consequently, sustainable development means to find a balance between the three pillars of sustainable development. Therefore, beside environmental protection, it is necessary to fulfill the other basic prerequisites for sustainable development.

One of the basic prerequisite for sustainable development is good governance, which is defined by the UN as governance that respects the principles of transparency, responsibility, accountability, participation and responsiveness to the needs of people. Institutional capacity, rules and practices of the governance are crucial for implementing sustainability concepts and measures.

Good governance has major characteristics, including participatory, consensus oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive, and pursuit of the rule of law. It ensures that minimization of corruption, respecting minority rights and considering voices of the most vulnerable in society in decision-making. It is also responsive to the present and future needs of society. Governance for sustainability should respect all these major characteristics while integrating considerations of all potential environmental effects of every decision into the center of them. Consequently, governance

should be guided by the principle that every decision should contribute to the sustainable development or should not have negative environmental consequences.

Transparency requires keeping all concerned actors well informed, so that it is essential to provide exact and recent information in economic, sociological and environmental matters. This requires access of all concerned parties to exact and true information about the trade conditions, environmental impacts of development projects while ensuring effective participation in decision making processes.

3.1.4. The World Summit

Ten years after Rio Conference, the World Summit on Sustainable Development (WSSD), was held in 2002 in Johannesburg, South Africa. Within these ten years little progress has been taken in international arena promoting environmental protection and sustainable development. During this time, the Kyoto Protocol was signed in 1997 by 84 countries to reduce greenhouse gas emissions. From 1997 until the World Summit in 2002, four conferences of parties (COP) were realized to establish an action plan and mechanism to monitor the Kyoto agreements.[102]

Meanwhile, from signature of the Kyoto Protocol in 1997 to World Summit in 2002, Millennium Summit was launched in 2000 to take measures to reduce poverty and hunger, to achieve universal primary education, to promote gender equality and to empower women, to reduce child mortality, to improve maternal health, to combat diseases such as HIV, to ensure environmental sustainability and to develop a global partnership for development. These measures were announced in the Millennium Declaration of the United Nations. Following the Millennium Declaration, in 2001 Doha Declaration was introduced by the Fourth Ministerial Meeting of the World Trade Organization (WTO).

Finally, the World Summit took place with the participation of 9101 delegates from 191 governments, 8227 representatives of major groups and 4012 media representatives reported.[103] The Johannesburg Declaration on Sustainable Development further elaborates the concept but rather than sustainability, it focused on the present development, including

[102] Buenos Aires in 1998, Bonn in 1999, The Hague in 2000 and Marrakech in 2001.
[103] Luc Hens and Bhaskar Nath, "The Johannesburg Conference", *Environment, Development and Sustainability,* Volume 5, Numbers 1-2, 2003, pp: 7-19.

intergenerational equity. By that time, it has been acknowledged that global challenge of sustainability lies in the complex interdependencies of environmental, social and economic development.[104] The world started to be aware of the complex relations between environmental resources, conflict as well as threats and opportunities of globalization. This process has been flourished by the extended participation of diverse range of interest groups and NGOs from developing world representing issues of human rights, social justice and business accountability.

The World Summit resulted in publication of two important documents, namely Johannesburg Declaration on Sustainable Development and Plan of Application of the WSSD. As a political declaration, the Johannesburg Declaration involved 32 principles with a vision of sustainable development.[105] The declaration repeated the worldwide obligation of the sustainable development and stressesed the necessity of equal and humanist society to realize the sustainable development.[106] According to the declaration sustainable development is characterized by multilevel policy action, a long term perspective and broad participation.

The Johannesburg Plan of Implementation for Sustainable Development underlined the importance of instruments of sustainable development policy, including capacity building, technology transfer, training and education, new partnerships, financial means and good governance. Related to plan of action on sustainable development there have been five priorities: water, energy, health, agriculture and biologic variety.

The plan contained actions and targets to realize the Agenda 21 objectives of Rio Conference. In this respect, the plan dealed with, poverty eradication, changing unsustainable patterns of consumption and production, protecting and managing the natural resource base of economic and social development, sustainable development in globalizing world, health and sustainable development, sustainable development of small island developing states, sustainable development for Africa, other regional initiatives, and means of implementation and institutional framework for sustainable development.[107]

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[104] Robert Potter, Tony Binns, Jennifer A Elliott, and David Smith, *"Geographies of Development"*, Harlow, Pearson Education, 2004, pp: 35-41.
[105] Luc Hens and Bhaskar Nath, *op.cit*, pp: 7-39.
[106] Aysegul Mengi and Nesrin Algan., "*Küreselleşme ve Yerelleşme Çağında Bölgesel Sürdürülebilir Gelişme AB ve Türkiye Örneği*", Siyasal Kitapevi, Ankara, 2003.
[107] Luc Hens and Bhaskar Nath, *op.cit*. pp: 7-39.

While countries agreed on the urgent need to respond to the problem of environmental deterioration in Stockholm, they agreed that the protection of environment and social and economic development have been fundamental to sustainable development at UNCED. With the adaptation of Agenda 21, Rio principles and the global programme UNCED was pointed as a mile stone for sustainable development. Finally, at Johannesburg Summit the aim was to reach a world that respects and implements the vision of sustainable development.

3.2. Climate Change and Sustainability under the UN

In the last couple of decades, it has been acknowledged that climate change policy is in close relation with many other policies, including biodiversity, human health, water and stratospheric ozone depletion. Upon this growing awareness, states and international community assess the policies and search for "sustainability" and "sustainable development" for the sake of the future generations. Policies on climate change, energy security and sustainable development contribute the reduction of GHGs in different sectors and in different countries.

International Panel on climate Change (IPCC) states in the Fourth Assessment Report that current climate change mitigation polices and sustainable development related policies, such as transportation and agriculture, are not enough to prevent the high growth of GHGs in the atmosphere.[108] Accordingly, the climate change has serious impacts such as drought, floods, severe weather and sea level rise cause food shortages, increases in vector borne diseases, infrastructure damage, and the degradation of natural resources. The most of the impacts of climate change hit poor people and poor countries disproportionately. Development choices made today will determine future greenhouse gas emissions and influence adaptive capacity.[109]

[108] IPCC, Inter-governmental Panel on Climate Change, *"Climate Change 2007: Synthesis Report Summary for Policymakers",* 2007.

[109] Adaptive capacity is an ability to adjust to climate change in order to moderate potential damage, take advantage of opportunities or cope with consequences. It is related to the level of a society's economic resources, access to technology, access to information on climate variability. The level of adaptive capacity is positively related to level of development since more developed societies tend to have more adaptive capacity. See IPCC, Inter-governmental Panel on Climate Change, *"Climate Change 2001: Synthesis Report Summary for Policymakers",* 2001.

Hence climate change, which depends on development choices, in return threatens development objectives. Although development activities could help reduce vulnerability[110] to many climate change impacts, "development as usual" may inadvertently increase vulnerability. Climate change threatens to disrupt the weakest economies and disadvantaged poor people in developing countries. In addition to the adverse affects, the developing world has the least resources and the least capacity to cope with them.

The Fourth Assessment Report of the IPCC estimates that the steady warming of the earth's surface temperature will lead to:

- Decrease in the quantity and quality of water in many arid and semi-arid areas, and decrease in the likelihood of making clean water available to the more than one billion people that already experience severe water shortages;
- Decrease in the reliability of hydropower and plantation biomass, where energy supplies are already unreliable;
- Increase in the incidence of vector-borne diseases (e.g., malaria and dengue), water-borne diseases (e.g., cholera), and malnutrition throughout the tropics and sub-tropics, where millions of lives are lost every year;
- Decrease in agricultural productivity in the tropics and sub-tropics. In particular, parts of Africa would be under additional stress, where an estimated loss of 10-30% of cereal production during the next several decades would make it even more difficult to attain the Millennium Development Goals of halving hunger by 2015;
- Increase in the loss of species and degradation of key ecosystems such as coral reefs, which play a critical role in the economy of some developing countries;
- Displacement of tens of millions of people in low-lying areas;
- Increased threat in national and regional security because of the loss of natural resources and the potential flow of environmental refugees;

[110] IPCC defines vulnerability as the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude and rate of climate change, and the degree to which a system is exposed, along with its sensitivity and adaptive capacity. Vulnerability increases as the magnitude of climate change or sensitivity increase and decreases as adaptive capacity increases. Reducing vulnerability can happen through any combination of reduced magnitude of climate change, reduced exposure, or increased adaptive capacity. See IPCC, Inter-governmental Panel on Climate Change, *"Climate Change 2001: Synthesis Report Summary for Policymakers",* 2001.

Unless concerted global action on climate change is taken, the IPCC estimates that the sea level could rise by one meter over the next century, which would have severe consequences. Especially, coastal communities would be severely threatened in countries that are at low-lying areas. For example, 17% of the land area of Bangladesh is expected to be lost and tens of millions of people to be displaced. Moreover, low-lying small island states may not be able to survive in the next decades, so that many island states in the Indian and Pacific Ocean and Caribbean that are only a few meters above sea level are under threat.

Climate change has different impacts on countries and communities. Developing countries are the most vulnerable to the negative impacts of climate change since they rely heavily on climate-sensitive sectors, such as agriculture and fisheries. Moreover, they have a low GDP, high levels of poverty, low levels of education and limited human, institutional, economic, technical and financial capacity.

The UNFCCC which is the first step of the Kyoto Protocol indicates that "all countries especially developing ones need to account the possibilities for achieving greater energy efficiency and control greenhouse gas emissions in order to achieve sustainable social and economic development."[111] Environmental sustainability is about the social issues such as social justice, gender equality and political participation.

The UNFCCC calls for the world wide sustainability in its Article 2;

> *".....stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to economic development to proceed in a sustainable manner."*[112]

Activities for reducing poverty, improving nutrition and education, environmental management and promoting sustainable livelihood opportunities would help reduce

[111] UNFCCC, "*United Nations Framework Convention on Climate Change",* 1992, p.3. Available at: http://unfccc.int/2860.php
[112] UNFCCC, "*United Nations Framework Convention on Climate Change",*1992, Article 2, p.4.

vulnerability to many climate change impacts. The sensitivity[113] and capacity of societies to adapt to effects of climate change is determinant factor of vulnerability of countries and societies. The capacity to adapt and cope with climate change depends on many factors including wealth, technology, education, institutions, information, skills and access to resources, which are generally more limited in poor countries and communities.

Climate change and its impacts should be placed into the mainstream of economic policies, development projects, and international aid efforts. The OECD Ministerial Declaration commits OECD Members to "work to better integrate climate change adaptation in development planning and assistance, both within their own governments and in activities undertaken with partner countries." In order to achieve these ambitious goals the governments are encouraged to take the following measures;[114]

- promote energy-efficient technologies and practices in the appliance and building sectors
- promote energy-efficient technologies and practices in industrial production and manufacturing processes.
- improve the efficiency and performance of existing power plants
- promote on-grid renewable energy
- promote the use of renewable energy for the provision of rural energy services (off-grid)
- facilitate market transformation for sustainable mobility in urban areas leading to reduced GHG emissions
- promote sustainable innovative systems for urban transport

The trend of climate change already has visible impacts on development. Development activities, including design of hydropower facilities, rural development and settlement policies, should adapt to the impacts of current and future climate risks. Hence, short-term and long-term impacts of climate change should be taken into account in development planning. It could be more cost-effective to implement adaptation measures in early stage, particularly for long-lived infrastructure. Moreover, future adaptation to the impacts of climate change can be constrained irreversibly by current and future development activities.

[113] Sensitivity is the degree to which a system can be affected, negatively or positively, by changes in climate, including mean climate and the frequency and magnitude of extremes. IPCC, Inter-governmental Panel on Climate Change, *"Climate Change 2001: Synthesis Report Summary for Policymakers"*.
[114] OECD, Declaration on Integrating. Climate Change Adaptation into. Development Co-operation. Adopted by Development and Environment, 4 April 2006. Available at http://www.oecd.org/dataoecd/44/29/36426943.pdf

Adaptation to climate change can be achieved by number of measures including altering farming practices and crop varieties, building new water reservoirs, enhancing water use efficiency, changing building codes, investing in air-conditioning, and constructing sea walls. Public and private actors can take adaptation measures through policies, investments in infrastructure and technologies, and behavioral change.[115] This issue will be further elaborated in the following chapters.

[115] OECD, "*Working Party No.1 on Macroeconomic and Structural Policy Analysis the Economics of Climate Change Mitigation: Policies and Post-2012 Options*", ECO/CPE/WP1 (2008)16, Paris, 2008.

IV. CLIMATE CHANGE

4.1. What is Climate Change?

Weather describes the actual state of the atmosphere at a given location at a given time in terms of variables such as air temperature, rainfall, and wind speed. Climate is defined as weather averaged over a period of time and possibly over a geographic region. Moreover, climate refers to the prevailing weather conditions, including temperature, humidity, wind speed, cloud cover and rainfall. Climate has profound implications on the well being of the environment and its constituents, since it affects all land, air and water.[116]

The Intergovernmental Panel on Climate Change (IPCC)[117] defines climate change as the increase of surface temperature of the earth due to accumulation of greenhouse gases (GHG) in the atmosphere. Although climate change and global warming are natural phenomena, the rates observed today are much higher and at worrying levels. This change in the rate is attributed to anthropogenic effects, particularly the effect of industrial revolution causing heat-trapping gases to accumulate in the atmosphere.[118] The problem of climate change is commonly associated with CO2 (carbon dioxide) emissions and its accumulation in the atmosphere so that most policy and response options are focused on regulation of its emissions.[119]

Although constituting the most important anthropogenic greenhouse gas, CO2 is only a part of the problem so that there are other gases that contribute to climate change at varying levels including methane (CH4), chlorofluorocarbons (CFCs), sulphur dioxide (SO2), nitrous oxide (N2O), NOx (nitrogen monoxide – NO and nitrogen dioxide – NO2), carbon monoxide (CO) and ozone (O3). Most of these gases are also associated with other environmental problems particularly, local pollution.

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[116] Climate and Weather Glossary. Available at: http://www.wrcc.dri.edu/ams/glossary.html

[117] The IPCC is managed by the IPCC Secretariat which is represented by WMO in Geneva. One of the major activities of the IPCC is to provide regularly assessment reports related to the state of knowledge on climate change. In addition to this, the IPCC prepares Special Reports and technical papers with the aim of providing independent scientific information.

[118] IPCC, Intergovernmental Panel for Climate Change, Third Assessment Report, Climate Change 2001, Impacts, Adaptation and Vulnerability, Geneva, 2001.

[119] *ibid*

The issue of climate change is one of the hottest environmental topics of the day and it gains ever growing attention since seriousness of the greenhouse effect becomes widely recognized. Since the beginning of the industrialization in the late 19th and early 20th century, series of innovative technologies have contributed to the high productivity of growth. The deployment of new technologies has eliminated environmental problems while creating new ones. However, activities with heavy reliance on the burning of fossil fuels outpaced sequestration of green house gasses by the eco-system. This caused a dramatic increase of CO2 emissions. Although the industrialized countries have disproportionately increased the accumulation of the CO2, the less developed and developing countries are vital for long term solution.[120]

There is now an international consensus among the world's leading experts, assembled under the auspices of the IPCC that concentrations of GHGs have increased dramatically since 1750, due primarily to human activities such as the combustion of fossil fuels. The IPCC's Fourth Assessment Report (AR4) stated that 'warming of the climate system is unequivocal', and that there is more-than-90% probability that most of the warming since 1950 has been caused by the rapid increase in greenhouse gas concentrations due to human activities.[121]

The IPCC has established that this increase has already had a discernible influence on the earth's climate. According to the IPPC's Fourth Assessment Report in 2007, the global surface temperature increased by 0.76 °C between 1906 -2005, since pre-industrial times. It projects 0.2°C increase per decade across a range of emission scenarios.[122]

It is claimed that the emission of greenhouse gases will inevitably lead to further warming of the earth in the course of this century. IPCC warns that without actions to limit future emissions, the global average temperature is likely to increase further by 1.8ºC to 4ºC by the end of 21st century and in the worst case scenario by as much as 6.4°C. The environmental and economic effects of such changes cannot be predicted exactly since they are all interlinked. Still it can be supposed that there will be far-reaching consequences before the end of the century.

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[120] Jagtar Bhatti, Rattan Lal, Mick A. Price and Michael J. Apps, *"Climate Change and Managed Ecosystems"*, CRC Press Inc.,2006, pp 23-29.
[121] IPCC, *Climate Change 2007: The Physical Science Basis: Summary for Policy Makers:* Contribution of *Working Group I to the Fourth Assessment report of the IPCC*, February, 2007.
[122] *ibid*

The rapid rise of greenhouse gas concentrations are driven by increases emissions of GHGs from human activities, driven by increases in the global population and economic growth, particularly the production and consumption of fossil fuels and the intensification of agriculture and changes in land uses. As the biggest contributor to global warming, CO2 emissions stem from land use, industrial production and most importantly from the combustion of fossil fuels for energy production and consumption.[123]

Deterioration in quality of potable water, frequent droughts, and extreme andcatastrophic weather events affect agriculture, water and other natural resources, so have negative impacts on human health. As a result of global climate, land erosion and degradation increase, which can cause deterioration of agricultural systems and local food supply for poor and lead migration.

The IPCC works on different scenarios and suggests that global temperature should be stabilized by 2-2.4°C increase by stabilizing GHG emissions at 350-400 ppm by the end of the century. Nevertheless, some argue that it will be difficult to stay below a 2°C increase, which is also the target of the European Union, since the climate system already contains more warming potential than previously assumed. According to the recent analysis and researches, GHG emissions are increasing faster then expected. Therefore, the planet's capacity to sequester carbon in natural sinks is decreasing and the temporary cooling effects of aerosols in the atmosphere are likely to diminish as more stringent clean air policies are applied. In this respect, it is estimated that the global warming by the end of the 21st century will go even beyond the threshold of a 2-2.4°C increase.[124] Table 4.1 indicates that the risks from any given global temperature increase are greater than expected.

[123] Jagtar Bhatti, Rattan Lal, Mick A. Price and Michael J. Apps, *op.cit*.p 32.
[124] Hans Joachim Schellnhuber, "*Global Warming: Stop Worrying, Start Panicking*?", Proceedings of the National Academy of Sciences of the United States of America, 2008.

Table 4.1. Different Scenarios of Climate Change

CO_2 Concentration at Stabilisation (2005=379 ppm)	$CO_{2\text{-equivalent}}$ Concentration at Stabilization (includes aerosols; 2005=375 ppm)	Year in which global emissions peak	Global average temperature above pre-equilibrium	Change in global CO_2 emissions in 2050 (% of 2000 emissions)
350 – 400	445 – 490	2000 – 2015	2 - 2.4 °C	-85 to -50
440 – 485	535 – 590	2010 – 2030	2.8 - 3.2 °C	-30 to +5
570 – 660	710 – 855	2050 – 2080	4 - 4.9 °C	+25 to +85

Source: IPCC, Inter-governmental Panel on Climate Change, *"Climate Change 2007: Synthesis Report Summary for Policymakers",* 2007.

4.2. Impacts of Climate Change

Climate change is expected to create a series of impacts, ranging from rising sea levels to eminent extinction rates of species; from adversely affecting the world's water resources to direct health effects on people. Moreover, climate change will have market impacts and non-market impacts. Market impacts are on water resources and demand of energy consumption, agriculture, and infrastructure while non-market impacts are on health, environment and migration.

As a result of climate change, the natural disasters have increased dramatically in the last decades. In the period of 2000-2008 the natural disasters caused more than 1.5 million victims 76,562 deaths and 1, 447, 936 affected and economic damage for around US$ 85.3 billion. In the same period, the floods that represent 50% of natural disaster related to climate change caused 548 deaths, 1.4 million affected and economic damage for around US$ 48 billion. Moreover, in the same period extreme temperatures caused 75,658 deaths while accounting US $ 12 billion of economic damage.[125]

The IPCC warns that the climate change will affect water systems, such as, increases in heavy precipitation events, increases in the frequency and severity of drought, increases in the number of hot days, increases in the frequency of severe weather events, exacerbation of

[125] EC, Commission of the European Communities, Communication from the Commission to the Council and the European Parliament, *"2008 Environment Policy Review",* COM/2009/0304, Brussels, p.11.

water shortages in many water-scarce areas of the world, increases in climatic variability, which includes changes in frequency, intensity and duration of extreme events such as hot days, heat waves, heavy precipitation and fewer cold days.[126] Moreover, many species are under the threat due to the climate changes.

Climate change is expected to have an additional stress on water resources through increased evaporation losses and water demands as a result of rising temperatures; reduced coastal freshwater supplies due to sea level rise and salinisation; increased precipitation extremes in certain regions, which has implications for flooding risks; initial increase and eventual reduction in glacial melt water as glaciers recede and eventually disappear in certain regions; reduced rainfall in other regions, such as Southern Africa and the Mediterranean rim, leading to enhanced drought risk; and decreased water quality in many regions as a result of higher temperatures, increased loadings of pollutants from more intense precipitation, and lower flow conditions during some seasons. Moreover, sea level rise would cause serious damage especial in coastal infrastructure.[127]

In addition, food production is estimated to be affected by the water availability. Climate change will have adverse affects on crop, yields and changes in the cultivated areas. Decline in cereal production in developing countries is expected due to the climate change. Moreover, climate change is expected to have wide ranging consequences for human health directly through increased temperatures, heat waves, floods, droughts and storms, as well as indirectly through its effects on water and food borne diseases, and on the geographical ranges and seasonal ranges of vector borne diseases. Due to the adverse effects of the climate change, there will be movements of people, displaced by drought and flooding, giving rise to large-scale conflicts. These market effects would transmit these impacts from the worst-hit regions to the rest of the world. Such effects would have drastic consequences for societies, particularly the poorest. For example, 63% of the population in Brazil, Russia, India and China live under medium to severe water stress. Nevertheless, this share tends to rise to 80% by 2030 if no measure is taken.[128]

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[126] IPCC, Inter-governmental Panel on Climate Change, "*Climate Change 2001: Synthesis Report Summary for Policymakers"*, 2001. See also IPCC, Inter-governmental Panel on Climate Change, *"Climate Change 2007: Synthesis Report Summary for Policymakers",* 2007.
[127] OECD, "*Integrating Climate Change Adaptation into Development Co-operation: Policy Guidance",* Paris, 2009, p.21.
[128] *ibid*, pp.22-25.

Similar to other environmental problems, the poor are not a major cause of climate change, but they are rather, victims of it. In this respect, the industrialized and rapidly industrializing countries have more responsibility for the large amount of the emissions. Nevertheless, in the future all countries will face more problems due to adverse effects of climate change.

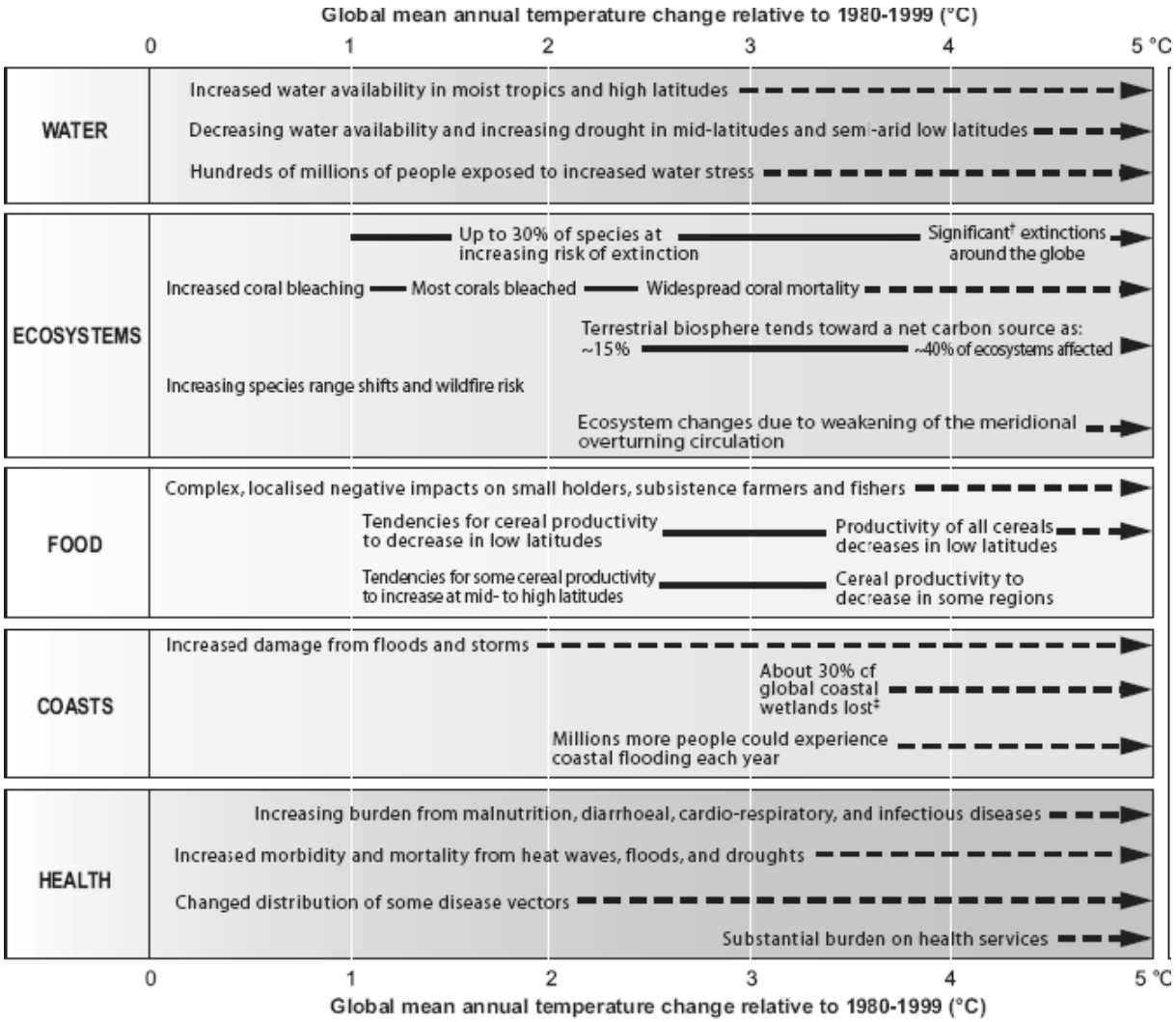
Poverty is often coupled with a lack of capacity to adapt to climate change. Moreover, the poor often live in risk-prone environments and they are highly dependent on natural resources, which are affected severely by climate change. They have neither technical and financial support mechanisms nor capacity to be engaged in environmental management as well as empowerment and participation. Therefore, the poor become more vulnerable to effects of climate change. In this respect, the less developed and developing countries seek financial and technical supports from the developed countries.[129]

'The Economics of Ecosystems & Biodiversity' Study was declared at the 9th Conference of the Convention on Biological Diversity in May 2008. The study estimated that the global loss of ecosystem services account annual loss of €50 billion. Accordingly, rising temperatures and the acidification of the oceans will cause loss of 60% of coral reefs by 2030, while 11% of natural areas are expected to be lost globally by 2050, mainly because of conversion to agriculture, expansion of infrastructure and climate change. Consequently, the Study warns that the cumulated welfare losses could reach 7% of GDP.[130]

Climate change has a direct effect on both supply and demand of energy. The projected impact of climate change on precipitation and glacier melt result in increase of hydropower production by 5% and decrease by 25%. Moreover, decreased precipitation and heat waves are also expected to influence negatively the cooling process of thermal power plants. Concerning the demand of energy, increasing summer peaks for cooling and impacts from extreme weather events are expected to affect electricity distribution.[131]

[129] *Ibid*, pp. 23-26.
[130] http://ec.europa.eu/environment/nature/biodiversity/economics
[131] European Commission, "*White Paper Adapting to Climate Change: Towards a European Framework for Action"*, *op.cit.*p.3-4.

Figure 4.1 Global Impacts Associated With Increases in Global Temperatures in the 21st Century



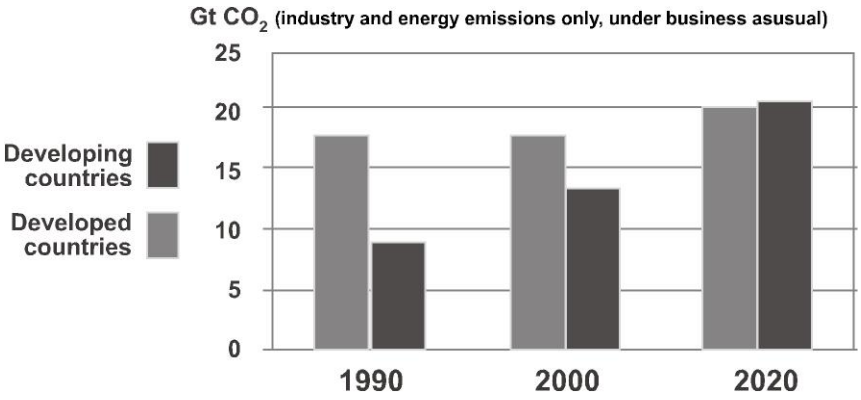
Source: IPCC, Inter-governmental Panel on Climate Change, "Climate Change 2007: Synthesis Report Summary for Policymakers", 2007.

4.3. Who is Responsible? The Share of Developed and Developing Countries in Climate Change

The United Nations Framework Convention on Climate Change (UNFCCC) and Intergovernmental Panel on Climate Change (IPCC) warn the nations of the world to take action before it is too late. Although it is hard to predict the exact outcomes and exact timing of climate change, scientists warn that by the time the actual problems start to arise, it will be too late to take any action that might slow down or reverse the change in climate.

During the 20th century, the most of the GHGs in the atmosphere steamed from the developed countries, which have the most financial resources and the greatest technological capacity. In order to reduce global emissions by at least half of 1990 levels by 2050, the IPCC estimates that developed countries should cut their emission, as a group, in the range of 25-40% by 2020 and 80-95% by 2050, compared with 1990 levels.[132] Although industrialized countries are historically responsible for the high concentration of greenhouse gases in the atmosphere, people in the developing countries are most vulnerable and least adaptive to the consequences of climate change.

Figure 4.2 Projected Greenhouse Gas Emissions



Source: EC, European Commission, *"EU Action Against Global Climate Change. Leading Global Action to 2020 and Beyond",* Brussels, 2009.

Although the developed countries should take immediate measures urgently, their actions alone will not be enough to reduce global greenhouse gas emissions. The more developing countries expand their economies, the more emissions they emit. By 2020 it is projected that developing countries will overtake total emissions from the developed world, as shown in Figure 4.2. While in 1990 share of developing countries in total GHG emissions were almost half of the developed countries, in 2000's their share started to rise rapidly, and expected to exceed the developed countries in 2020s. Some developing countries grow rapidly and catch the developed countries in terms of GDP and emissions. Therefore, developing countries, particularly the more advanced emerging economies, should take measures to limit their

[132] IPCC, Inter-governmental Panel on Climate Change, *"Climate Change 2007: Synthesis Report Summary for Policymakers",* 2007.

emissions growth. It is expected that GDP will double in China and India, and to rise by 50% in Brazil in 2020.

Table 4.2 GHG Emissions Divided by Regions in 2000 and 2050 (%)

Region	2000	2050
Canada and USA	23	12
Enlarged EU	14	8
Russia and CIS	8	5
Oceania and Latin America	12	10
Africa and Middle East	12	23
Asia	31	42
Total	100	100

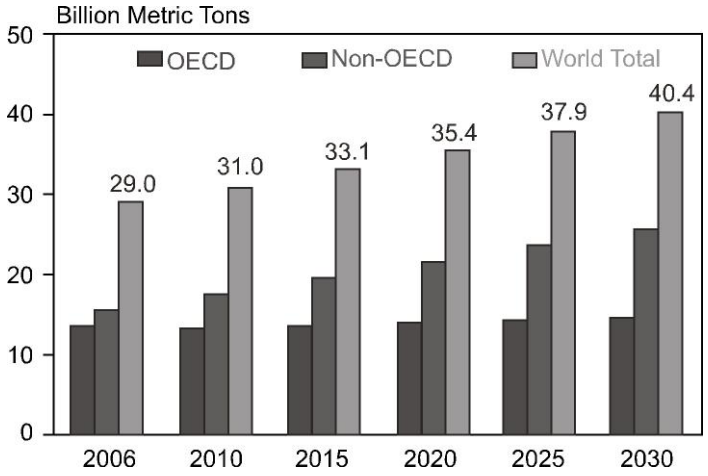
Source: EC, Commission of the European Communities, Communication from the Council to European Parliament, the European Economic and Social Committee and the Committee of Regions, *"Winning the Battle Against Global Climate Change"*, COM/2005)/5, Brussels, 09.02.2005.

The table 4.2 compares the GHG emissions in 2000 and projections in 2050 in different regions. As shown in the table, the share of historical emitters such as the US, EU countries and Russia tend to decrease. Accordingly, the share of Canada and US will decrease from 23% in 2000 to 12% in 2050. On the other hand, the share of Asia, which hosts generally the developing or less developing countries, is expected to increase from 31% to 42% in the same period.

The primary energy consumption of Brazil, Russia, India and China together is expected to increase by 72% between 2005 and 2030, compared to 29% rise in 30 OECD countries. In business as usual scenario, GHG emissions of these four countries are expected to grow by 46% in 2030, surpassing those of the 30 OECD countries combined.[133] The most rapid growth in energy demand from 2006 to 2030 is projected for non-OECD nations in the same period. It is estimated that the total non-OECD energy consumption will increase by 73% while OECD countries' consumption will rise by 15%.[134]

[133] OECD, *"Environmental Outlook to 2030"*, Paris, 2008, pp. 5.
[134] IEA, International Energy Agency, *"The World Energy Outlook 2009 Climate Change Excerpt Special Early Release at Bankong UNFCCC Meeting",* Paris, 2009.

Figure 4.3 World CO2 Emissions 2006-2030



Source: EIA, World Energy Projections Plus, 2009

IEA's last report projects that world CO2 emissions will raise from 29.0 billion metric tons in 2006 to 33.1 billion metric tons in 2015 and 40.4 billion metric tons in 2030, which accounts 39 % of increase, as shown in Figure 4.3.. Due to strong economic growth and ongoing heavy reliance on fossil fuels in the non-OECD economies, it is estimated that much of the increase in total CO2 emissions will to occur among the developing, non-OECD nations. In 2006, non-OECD emissions have already exceeded OECD emissions by 14 %. Indeed, non-OECD emissions are projected to exceed OECD emissions by 77 % in 2030.[135]

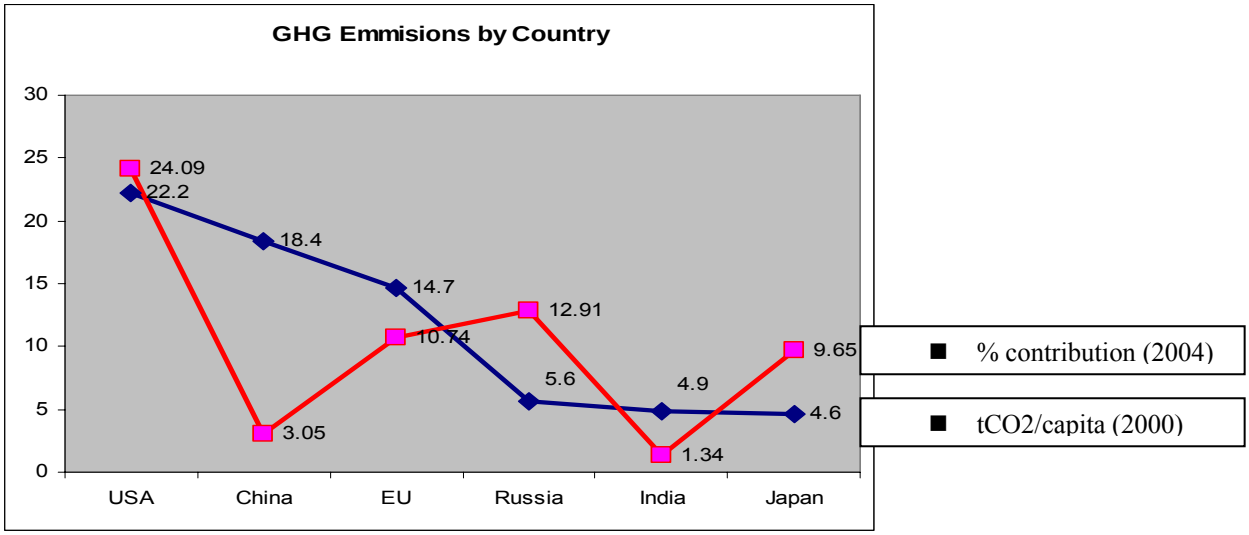
However this picture changes dramatically, when countries and regions are ranked according to CO2 intensity of output, reflecting the greater energy efficiency and less carbon-intensive energy mix of more developed economies in emerging countries, lower energy efficiency and their rising contribution to world GDP growth, has contributed to the moderation in energy efficiency gains observed at the world level in recent years.[136] Non-OECD emissions per capita remain much lower than the average per capita emissions of the OECD countries.

The European Commission estimates that taking action to cut emissions in these countries cost just 1% this GDP growth.[137] This estimation do not take into account the benefits of avoiding the damage that climate change would cause, so the cost might be even smaller and even negative. Developing countries have many policy options where the benefits outweigh

[135] *Ibid*
[136] OECD, *"Environmental Outlook to 2030"*, *op.cit*, p.9.
[137] EC, European Commission, *"EU Action Against Global Climate Change. Leading Global Action to 2020 and Beyond",* Brussels, 2009, p.22.

the costs. For example, boosting energy efficiency leads energy security, while capturing methane from industrial and agricultural sources for cheap energy. Moreover, implementing policies to promote renewable sources of energy are often cost-effective, including for rural communities. In addition, improving air quality promotes public health. Nevertheless, Industrialized countries should further their cooperation with developing countries in order to provide the necessary finance and technology and to support capacity building.[138]

Figure 4.4 Country Comparisons: CO2 / per Capita



Note: Red -- % contribution (2004); Blue – tCO2/capita (2000)
Source: Carbon Finance Assist

4.4. Energy and Climate Change

The economic, political or military power has been shaping and determining the distribution of wealth. The unequal distribution of the fossil fuels in the world geography and the struggle to utilize these fuels in maximum terms put the energy on the top of the agenda of the countries. The developed countries have the power on the management of the energy resources, so that creates certain level of dependence of developing world to the developed countries. As energy has become a matter of trade, the power struggle has also been deepened and new actors have come onto the stage.

Energy is an essential resource for economic and social development and improved quality of life in all countries. For many decades the world's energy has been produced and consumed

[138] *ibid.* p.18

not in sustainable ways. The need to control greenhouse gas emissions is based on efficiency in energy production, transmission, distribution and consumption. Energy is the motor of economic growth and social development, which can be achieved if secure, reliable and affordable energy supplies are ensured. As a strategic commodity, energy policy should be considered carefully that needs to be given due attention, especially in the face of growing global energy demand.

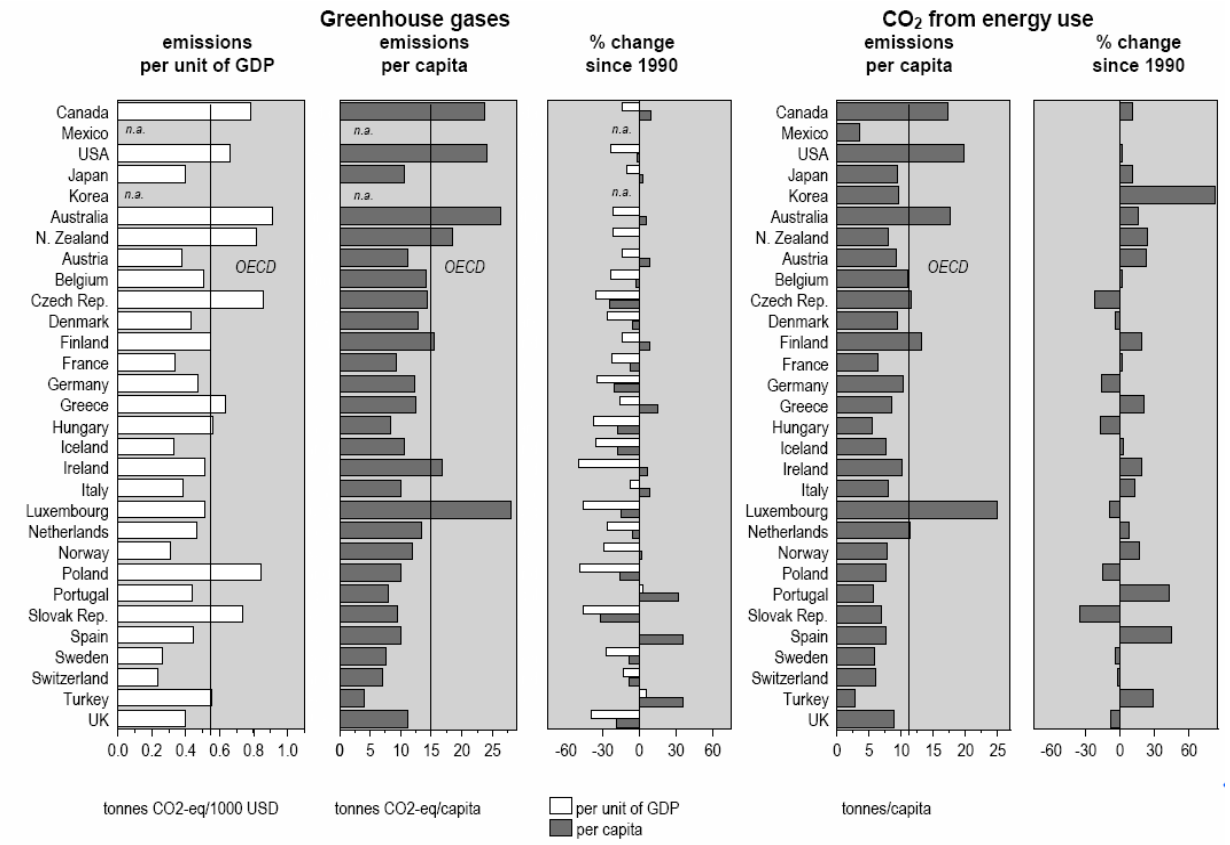
Main driving forces affecting future energy markets and environment are economic growth, demographic developments, technological improvements and environmental policies. Energy is related to many environmental and social challenges, including land use, global climate change, water and urban air quality. Any action on combat against the climate change will have a significant impact and implications for energy policies. As the global energy demand increases, the trade-offs between the economic, social and environmental considerations should be taken into account while determining the country's energy mix. Therefore, the balance between economics, social needs and environmental protection should be watched very carefully while determining sustainable energy and climate policies. In this respect, climate and energy policies should be integrated. In order to achieve this it is profound to deploy and follow long-term, market oriented, cost effective, and harmonious policies, which are fostering innovation and commercialization of technologies.

The shape of the future global climate policy is fundamentally uncertain. Given that burning fossil fuels is the most important source of greenhouse gases, climate policy will have a serious effect on future energy demand and supply. Prolonged burning of fossil fuels is expected to lead to further global warming and the negative impacts from climate change may affect environment and economy. The policy challenge for the coming decades is to combine ambitious economic growth and a clean environment.

Adequate energy supplies are indispensable for economic growth and poverty reduction, but the current reliance on fossil fuels is not sustainable. Transitioning to new energy sources poses a significant challenge to all countries. Future of humanity on this planet may depend on finding new ways to supply the world's growing energy needs without harming the environment. This could be achieved through new energy technologies, greater energy efficiency, and alternative renewable sources that provide a low-carbon path to growth.

The OECD reports that in OECD Europe, CO2 emissions from energy use stay more or less stable due to changes in economic structures and energy supply mix, energy savings and, in some countries, of decreases in economic activity over a few years. It is indicated that numerous environmental effects have been already de-coupled from growth in energy use, but the current results are insufficient and the environmental implications of increasing energy use remain a major issue in most OECD countries (Figure 4.5). Therefore, the main challenge is further de-coupling of the energy use and related emissions from economic growth, through improvements in energy efficiency and development and use of cleaner energy resources. To achieve this, it is essential to apply a mix of instruments including extended reliance on economic instruments.[139]

Figure 4.5 Country Comparisons of GHG Emissions



Source: OECD, "Key Environmental Indicators", Paris, 2008.

[139] OECD, "*Key Environmental Indicators",* Paris, 2008, p.28.

4.4.1. Energy Supply and Demand

The accelerating trend in energy use and the potential consequences are at the top of the agenda of the international community. It is difficult to make projections of energy demand, particularly during the recent global financial crisis, economic downturn, and significant fluctuations in the price of energy, particularly oil.

Societies are fuelled by energy and future economic lead increased availability and use of energy. The International Energy Agency forecasts that energy demand in 2030 will be 45 % higher than energy use in 2006, for an average annual growth of 1.6 %, or just a little slower than the 1.9 % from 1980 to 2006. The share of energy- related CO2 emissions in total emissions is expected to increase from 61% in 2005 to 68 % in 2030. Energy demand would increase further by taking into consideration the electricity needs of the 1.6 billion people in developing countries that lack access to electricity, combined with population growth. Therefore, market competition is expected to intensify, which means the rise of the oil prices that hampers the global economy.[140]

In 2006, global energy use from all sources reached 11.5 billion metric tons of oil equivalents, twice as high as its 1971 level. High-income economies, with just 15 % of world population, use almost half of global energy. The United States, Russian Federation, Germany, Japan, China, and India are the top energy consumers, accounting for 55 % of global energy use.[141]
In 2006 about 80 % of the energy was from nonrenewable fuels, which are carbon dioxide emitting oil, coal, and gas. Unless, new policies are implemented, this share is projected to remain above 80 % in 2030, with demand for coal growing faster than that for oil and gas.[142]

High oil prices cause inflation in oil importing countries and also lower investment and non-oil demand whilst increasing input costs, resulting in exacerbated budget-deficit problems. Moreover, with the rise of energy consumptions, it is getting difficult to attain economic and social benefits without depriving the environment.[143]

[140] IEA, International Energy Agency, *"World Energy Outlook 2008",* Paris, 2008, pp. 4-17.
[141] WB, the World Bank, *World Development Indicators,* 2009 Available: http://web.worldbank.org
[142] IEA, International Energy Agency, *"World Energy Outlook 2008",op.cit.* p. 33.
[143] *ibid.*p.45.

There is a tremendous need to increase the energy supply infrastructure in order to satisfy the growing global demand. The International Energy Agency (IEA) estimates that the energy sector will need 26 trillion USD investments by 2030 in order to sustain current energy trends. About half of that investment will take place in developing countries.[144]

Business-as-usual energy consumption is not sustainable since it results in energy insecurity and climate damages. Clean and efficient production and use of all forms of energy is essential for energy security and economic growth. "Green" energy supply and economic growth are indispensable for the national and international climate policies and actions. Moreover, decoupling growth of emissions from economic growth is vital in this manner. In this respect, mitigation efforts during the next decades will determine to a large extent the long-term mean global temperature increase and the corresponding climate change impacts that are avoided.[145]

Policies aiming energy efficiency can reduce the need for investing in energy infrastructure, cut fuel costs, increase competitiveness and improve consumer welfare. Moreover, energy efficiency contributes to reduction of greenhouse gas emissions and air pollution. Some goods and services are more emissions-intensive energy so that the energy-related carbon dioxide emissions are embedded in imports as well as exports.[146]

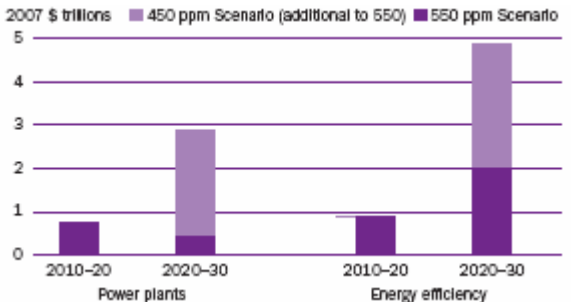
Although there is a growing market for climate friendly, renewable energy sources and technologies, there are still many barriers. First of all, the costs of some technologies are high at their early stages, when economies of scale cannot be realized. Moreover, research and development in this field is still insufficient. Concerning the biofuels, there are concerns about the impact on food supplies. There are also questions about the net contribution of biofuels to lower greenhouse gas emissions.

As shown in the Figure 4.6, it is estimated that 550 ppm Policy Scenario requires $4.1 trillion on energy efficiency and power plants and reducing consumption of fossil fuels by 22 gigatons of oil equivalent over 2010–30 through more efficient energy use. The International Energy Agency estimates that the net undiscounted savings in the 550 ppm Policy Scenario,

[144] IEA, International Energy Agency, *"A Clean Energy New Deal: Ensuring Green Growth in a Time of Economic Crisis"*, Paris, 2008. p.5.
[145] *Ibid.*p.10.
[146] See http://www.iea.org/about/docs/iea2008.pdf

compared with the Trend Scenario, amount to more than $4 trillion. The 450 ppm Policy Scenario requires additional investment of $3.6 trillion in power plants and $5.7 trillion in energy efficiency over 2010– 30 relative to the Trend Scenario.[147]

Figure 4.6 Change in Power Plant and Energy Efficiency Investments in the Policy Scenarios Relative to the Trend Scenario



Source: IEA, International Energy Agency, *"World Energy Outlook 2008",* Paris, 2008.

The US President Obama declared that the American Recovery and Reinvestment Act foresee more than $60 billion in clean energy investments, which will boost the US economy and promote clean energy jobs. The President issued a memorandum to the Department of Energy to implement more aggressive efficiency standards. The US plans to invest $15 billion annually in the next 10 years in order to develop clean energy including wind power and solar power, geothermal energy and clean coal technology. The US Government targets to get 25 % of the nation's power from renewable energy sources by 2025.[148] On the other hand, the EU aims to get over 20 % of overall primary energy consumption from renewable energy sources. Among the EU members, Austria is one of the leaders in renewable energy production and technologies, with a share of renewable energy in total energy production planned to rise to 34 % by 2020. Moreover, new laws and policy provisions for renewables are released in Brazil, Chile, Egypt, Mexico, the Philippines, South Africa, Syria, and Uganda. As one of the few countries that have established an ambitious national goal to reduce energy intensity by 20% China achieved to double its total wind power capacity in 2008.[149]

[147] IEA, International Energy Agency, "*World Energy Outlook 2008"*, *op.cit* . p.8.
[148] http://www.whitehouse.gov/issues/energy_and_environment/
[149] Statement of Kandeh K. Yumkella, UNIDO Director-General and Chair of UN-Energy, 24/06/2009 http://en.cop15.dk

The ever-growing demand for energy will put a growing challenge on natural resources and the environment. Natural resources are not infinite and oil and gas reserves can be expected to become depleted over time. Another growing concern is the impact of energy use on the environment. The combustion of fossil energy leads to emissions of GHGs and causing global warming. There may be important feedbacks on energy use and the economy. Physical disruptions in the supply of energy and large variations of the price of energy significantly affect economic growth. Climate change may lead to a large range of hazards, like deterioration of biodiversity and increased water stress. When thinking about energy in the future, one cannot neglect the adverse effects and possible feedbacks.

4.5. How to Tackle Climate Change?

Mitigation and adaptation are central pillars of the climate policies. The scope of the climate change issue is large so it should involve all major sectors of the economy since climate effects cannot be mitigated by changes just in few sectors or industries. Moreover, single strategy will not be enough to reduce emissions to the levels needed to sufficiently slow the pace of climate change. Therefore, different strategies should be followed in different sectors and regions while promoting technological development, research and development (R&D) and behavioral changes and increasing energy efficiency.

Taking measures against climate change requires behavioral change, for example driving less, using less electricity, purchasing more energy-efficient appliances and vehicles, and switching to alternative sources of electricity. Small changes in individual and business behavior lead large decreases in collective GHG emissions. Behavioral change can be stimulated by increased public awareness or the government policy incentives in a market-based approach. For example, households may alter consumption patterns against higher prices and bills, while firms scrap emissions-intensive capital equipment, especially in the initial transition to an appropriate emissions reduction trajectory.[150]

The cost of emission reduction can be decreased through three main tools including i) carbon pricing in the form of taxes or emissions trading; ii) government support for research,

[150] RAND, *"Integrating U.S. Climate, Energy, and Transportation Policies*", 2009. Available at: www.litagion.com/pubs/conf_proceedings/2009/RAND_CF256.sum.pdf

development, demonstration and, in some sectors, early-stage deployment of technology; and iii) measures that create conditions that enable consumers to choose clean technologies.[151]

4.5.1. Mitigation and Adaptation to Climate Change

There are two broad enhanced ways to reduce the risks of climate change: namely mitigation and adaptation. Mitigation targets to avoid or at least to limit climate change, by reducing the emissions of GHGs, through actions such as promoting energy efficiency, the use of renewable energy and avoiding deforestation. Therefore, mitigation consists of activities that aim to reduce GHG emissions, directly or indirectly, by avoiding or capturing GHGs before they are emitted to the atmosphere or sequestering GHGs already in the atmosphere by enhancing "sinks" such as forests. On the other hand, adaptation includes deliberate actions to reduce the adverse consequences, as well as to harness any beneficial opportunities.[152] The mitigation of GHGs can be triggered through the changes in life styles, including education and training programmes, usage of mew technologies, urban planning and staff training in industry with documentation of existing practices.

Mitigation and adaptation policies are utmost importance for international negotiations on climate change. Although both the UNFCCC and the Kyoto Protocol mention about the adaptation, there is no clear policy objective, except reporting requirements on adaptation actions. The international community focus more on implementation of adaptation so that in COP-7 in Marrakech in 2001, three funds were established dealing with adaptation; namely the Least Developed Countries Fund, the Special Climate Change Fund and the Adaptation Fund.[153]

Despite the reduction of the emissions, the climate will continue to change over the next centuries. Hence, mitigation and adaptation to climate change are vital and complementary. Through the emission reduction, it is possible to reduce or delay the damages caused by climate change.[154] The mitigation of climate change is crucial to limit long-term impacts, however there is still need for adaptation actions since the climate change is already happening. Moreover, it will

[151] Gunnar Still, Noriko Fujiwara and Christian Egenhofer, "*Making The Most of the G8+5 Climate Change Process Accelerating Structural Change and Technology Diffusion on a Global Scale",* CEPS Task Force Report, 2008, pp: p.31-32.
[152] IPCC, **"***Climate Change 2001: Synthesis Report Summary for Policymakers".*
[153] See www.unfccc.int
[154] See www.unfccc.int

continue due to the GHGs that have already been emitted and that will be emitted in the upcoming decades.

According to the definition of the UNFCCC, adaptation is a "process through which societies make themselves better able to cope with an uncertain future". Adapting to climate change requires taking the appropriate measures and making adjustments and changes in order to reduce the negative effects of climate change.[155] The IPCC defines adaptation as "adjustment in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts. This term refers to changes in processes, practices, or structures to moderate or offset potential damages or to take advantage of opportunities associated with changes in climate."[156]

The IPCC emphasizes that adaptation policies involve actions taken by governments, including legislation, regulations and incentives, in order to mandate or facilitate changes in socio-economic systems for reducing vulnerability to climate change. The adaptation policy aims to integrate climate change issues into developmental policies and goals. Development policies should be strengthened by sustainable development goals and should improve climate change mitigation, while building resilience and adaptive capacity.

If business-as-usual (BAU) development plans do not take into account climate change, this might lead to maladaptation and result in greater vulnerability to climate change. This may retard development by allowing climate extremes to result in larger losses. There are also some overlaps between 'business-as-usual' development strategies and adaptation. Some measures that are taken to achieve development objectives can automatically lead to adaptation benefits. For instance, a range of development activities to reduce poverty and improve nutrition, education, infrastructure and health would simultaneously lead decrease vulnerability to many climate change effects. Moreover, a healthier and better-educated population with improved access to resources is more capable to cope with climate change. IPCC claims that better developed societies possess more adaptive capacity than less developed societies and therefore have lower vulnerability to climate change.[157]

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[155] IPCC, **"***Climate Change 2001: Synthesis Report Summary for Policymakers".*
[156] *ibid*
[157] OECD, Organization for Economic Co-Operation and Development, "*OECD Contribution to the United Nations Commission on Sustainable Development 14: on the Themes of Climate Change, Energy and Industry",* Paris, 2006, pp.27-31.

There are already some countries taking adaptation measures, however this is generally in a piecemeal manner. Hence, there is need for more strategic approach to employ timely and effective adaptation, ensuring coherency across different sectors, regions and levels of governance. Adaptation to the climate change requires the involvement of wide range of actors, including individuals, communities, civil society, governments and private actors. Sustainable responses to climate change urge all these actors to internalize current and anticipated climate risks in their various decisions, while keeping in mind the associated uncertainties.

Since overall political responsibility is located in the national level, it is vital for climate change adaptation efforts. First of all, the national level government sets legislation and regulations that directly or indirectly affect the climate risks or create the incentives for exploring climate adaptation opportunities. Concerning the adaptation, governments and public agencies have a particular role since governments are the guardians for public assets and provide services, which may be affected by climate change. Moreover, governments establish rules and regulations that can enhance or constrain the ability of other actors to adapt to the impacts of climate change. Governments are also responsible for investments in "public goods" such as monitoring of weather and climate, provision of weather forecasts, and research and development that could affect the ability of other actors to better adapt to the impacts of climate change.

National government priorities, which are defined and implemented through budget allocations, may facilitate adaptation across different government levels. Moreover, the national government provides delivery of important prerequisites for adaptation including data, analysis and assessments which are vital to take actions for climate change impacts, vulnerability and early warning systems. In addition, besides the conduct of international relations, coordination of sectoral policies and branches of government is carried generally at the national level. Consequently, in order to achieve appropriate adaptation to climate change at the national level, it is vital to make necessary adjustments to the national governance framework, including its structures, policy formulation processes, systems and procedures.

Decision-making on adaptation must be based upon the best available information on the implications of both the current and future climate on the country. Therefore, it is vital for decision-making bodies to have reliable data and information on current climate and extremes, as well as projections of climate change, and assessments of impacts and vulnerabilities. Depending on these data, regulations lead individuals and businesses to reduce certain types of emissions in certain ways.

Developing Countries make assessments of climate change impacts and vulnerabilities and summarize the results in their National Communications to the UNFCCC. Moreover, several Least Developed Countries (LDCs) develop National Adaptation Programmes of Action (NAPAs) that classify priority activities urgent and immediate needs for adaptation to climate change. In the process of preparation of the NAPAs countries make synthesis of available information, participatory assessment of vulnerability to current climate variability and extreme events and areas where risks would increase due to climate change. Moreover, NAPAs identify key adaptation measures as well as criteria for prioritizing activities. Hence, the NAPAs focus on activities addressing urgent and immediate adaptation needs for which further delay could increase vulnerability or lead to increased costs at a later stage. The NAPAs should be action-oriented, country-driven, and flexible and should be based on national circumstances. Hence, the NAPAs should establish priorities for action so they can be important tools for development planners.[158]

4.5.2. Energy Efficiency

Promotion of energy efficiency and low carbon energy supply are the main measures in order to decrease the emissions in energy sector. According to the McKinsey Report, there is energy efficiency opportunity of 14 Gt CO2e per year in 2030. Fuel-efficient car engines, better insulation of buildings, and efficiency controls on manufacturing equipment are some of the possible efforts to improve the energy efficiency and to reduce energy consumption.[159]

In order to shift energy supply from fossil fuels to low-carbon alternatives, there are some opportunities, including electricity production from wind, nuclear, or hydro power, as well as

[158] http://unfccc.int/national_reports/napa/items/2719.php
[159] McKinsey Report, *"Pathways to a Low-Carbon Economy: Version 2 of the Global Greenhouse Gas Abatement Cost Curve"*, January 2009, p.10.

equipping fossil fuel plants with carbon capture and storage and replacing conventional transportation fuel with biofuels. If all the low-carbon alternatives were to be fully implemented, it is estimated that there is potential to provide about 70 % of global electricity supply by 2030 compared with just 30 % in 2005. In this framework, biofuels is projected to provide 25 % of global transportation fuel by 2030.[160] On the other hand, buildings contribute about 40% of the global GHG emissions, which can be reduced through wide range of available techniques for insulation, heating, cooling, ventilation and lighting.[161] The building sector is estimated to have potential energy savings of 27% and 30% in residential and commercial buildings, while the transport sector accounts 26% and the manufacturing industry 25% of saving potential.[162]

The right incentives may promote large scale technological shift toward a lower carbon and more energy efficient economy that also delivers affordable energy solutions for 2.4 billion people who are currently without basic energy services.[163] Today, 16% of the global population, namely the one billion people, living in developed regions consumes half of the world's energy supply, while one billion of the world's poorest people use 4% of world energy. Underinvestment in energy reduces GDP growth in some countries by 1-3% annually.[164]

Consequently, public policies should focus on improving energy and grid transmission as well as energy storage systems. Although energy-saving investments generally require high costs, energy savings cost less and spread over many years. Primary energy use in developing countries can be cut by 30–50% since the cost of energy savings is much lower than cost of increasing energy supply. Hence, promoting cost-effective improvements in energy efficiency are vital for increasing energy supply.[165]

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[160] *ibid,* p.10

[161] WBCSD, World Business Council for Sustainable Development, *"Policy Directions to 2050: A Business .Contribution to the Dialogues on Cooperative Action",* Geneva, 2007.*pp.34-38*

[162] EC, European Commission," Communication on an Action Plan for Energy Efficiency: Realising the Potential", COM(2006) 545, European Commission, Brussels, 19 October 2006

[163] WBCSD, World Business Council for Sustainable Development, *"Investing in a Low-Carbon Energy Future in the Developing World"*, Geneva, 2009, p. 2.

[164] WBCSD, World Business Council for Sustainable Development, *"Energy and Climate: Facts and Trends to 2050*", Geneva, 2007.

[165] World Bank, "*Clean Energy for the Development Investment Framework: The World Bank Group Action Plan"*, Washington, D.C., 2007.

4.5.3. Technological Development

Given that appropriate technologies are applied at the right pace, countries can catch unique opportunity to combine global growth and creation of jobs with a transition to sustainable and low-carbon economy. In the long-term, new technologies will be vital to address climate change. In order to encourage development and deployment of climate-friendly technologies, price on carbon emissions can be put through cap-and-trade schemes. In the way to low-carbon economy, innovation should be encouraged while promoting efficiency and rapid deployment of new breakthrough technologies once they are developed. Hence, a mix of policies is essential in the process.

In the short term, introduction of win-win policies can lead to economic and environmental opportunities. First of all, one of the policies is removing subsidies to fossil fuel-based energy production and consumption. The OECD indicates that removing fossil fuel subsidies in emerging and developing countries alone could reduce global GHG emissions by 10% by 2050, while also increasing the efficiency of these economies. Secondly, it is feasible cutting trade barriers to climate-friendly goods, such as on energy efficient equipment, technologies for generating electricity from renewables, energy-efficient light bulbs. Another policy measure is addressing market failures that prevent improvements in the energy-efficiency of buildings and transport systems, through building codes and household electrical appliance standards. The OECD analysis suggests that policies to support current biofuels production in some OECD countries may cost as much as USD 1,000 per tones of CO2 reduced, which is expensive to pay emission reductions.[166]

The IEA's Energy Technology Perspective highlights that the diffusion of technologies, which are currently available or at an advanced stage of development, could reduce GHG emissions against "business as usual" (BAU) by 35 GT CO2 back to current levels by 2050.[167] The IEA estimates that 70% of emissions reductions could be achieved through the diffusion of existing low-carbon and energy-efficient technologies, along with technologies in an advanced state of development. Delaying the implementation of these technologies today

[166] OECD, *"The Economics of Climate Change Mitigation: How to Build the Necessary Global Action in a Cost-Effective Manner?",* Working Document ECO/WKP(2009) 42, Paris, 2009.
[167] IEA, International Energy Agency, *"Energy Technology Perspectives",* Paris, 2008.

may lead economies to become "locked-in" to carbon-intensive development.[168] In this case, it would be more difficult to achieve the necessary emissions reductions in time.

4.5.4. Investment

According to the UNFCCC analysis in 2007, investment and financial flows directed to developing countries are estimated to amount an additional €61-62 billion ($76- 77 billion) for mitigation and at least €23-54 billion ($28-67 billion) for adaptation in 2030.[169] The most costly sectors for mitigation efforts are estimated to be transport, forestry and industry while funds for adaptation will mainly be focused on infrastructure, water supply, agriculture, forestry and fisheries. Developing countries are more vulnerable to the impacts of climate change and offer most of the cost-effective opportunities for reducing emissions. According to the report, the private investors contribute 86% of investments and financial flows.[170]

The IEA estimates that there is a need for an annual incremental investment of US$ 1.1 trillion in order to reduce energy related CO2 emissions by 50% from current levels by 2050.[171] Over half of this investment is expected to be made in developing countries. Due to insufficient levels of investment, there is an urgency to increase and accelerate investment to slow the growth of CO2 emissions by 2020. Market instruments are central pillars in providing a significant proportion of the investment.

In OECD countries it is estimated that the construction of new infrastructure and buildings resilient to climate change will be in the range of $15-150 billion each year (0.05-0.5% of GDP).[172] On the other hand, the World Bank estimates that the costs of 'climate proofing' and investment amounts to between $10 billion and $40 billion annually.[173] The UNFCCC projects that the additional investment and financial flows needed for adaptation in the infrastructure will amount $2-41 billion for non-Annex I Parties and $8-130 billion globally in

[168] WBCSD, World Business Council for Sustainable Development, *"Towards a Low-carbon Economy"*, Geneva, 2009, pp.7-9.
[169] UNFCCC, "Report on the analysis of existing and potential investment and financial flows relevant to the development of an effective and appropriate response to climate change, Dialogue on long-term cooperative action to address climate change by enhancing implementation of the Convention", *Dialogue Working Paper*, No.8, 2007.
[170] *ibid*
[171] IEA, International Energy Agency, *"Energy Technology Perspectives*" ,*op.cit.* p.5.
[172] Nicholas Stern,."*Stern Review on The Economics of Climate Change*", *op.cit,* p.21.
[173] World Bank, "*Clean Energy and Development: Towards an Investment Framework*"., World Bank, Washington DC, 2006.

the year 2030.[174] According to the European Commissioner for Environment, Dimas, the massive expansion of renewable energy will put some $130 billion worth of extra investment and create around 700,000 new jobs by 2020.[175]

4.5.5. Research and Development (R&D)

Public energy R&D funding has fallen by 50 % in major developed countries in the last 25 years. The IEA estimates that there is a need for annual investment of approximately US$ 150 billion in research, development and deployment. Hence, there is an urgent need for funds necessary for R&D investment and comprehensive technological transformation.[176]

Introduction of new low-carbon technologies by 2020 requires large-scale cooperation since it is difficult in terms of financial and technical capacity of individual countries or businesses. In order to achieve this, there is a need for new forms of public-private partnerships where governments, R&D institutions, suppliers and potential technology user's work together to organize, fund, screen, develop and demonstrate selected technologies in a short-term.[177]

4.5.6. Market-based Approaches

Market-based approaches are necessary components of the climate policies, providing wide range of acceptance from the society and business-world while ensuring numeric reductions emissions. In this respect, two main market instruments are cap-and-trade system and carbon tax. In a cap-and-trade system, the government sets emissions limits and issues tradable permits for the amount of emissions that can be produced by an emitter. On the other hand, carbon tax sets a price for emissions, but imposes no limit on the amount of emissions an emitter can produce.[178]

The policy tools of adaptation and mitigation are similar, which affect business activities directly or indirectly through customers. Following activities can be identified;

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[174] UNFCCC, "Report on the analysis of existing and potential investment and financial flows relevant to the development of an effective and appropriate response to climate change, Dialogue on long-term cooperative action to address climate change by enhancing implementation of the Convention", *Dialogue Working Paper,*

[175] Speach of Stavros Dimas, "*Europe's contribution to a low carbon economy*", January 26, 2009 Available at:http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/09/21&format=DOC&aged=0&language=EN&guiLanguage=en

[176] WBCSD, *"Towards a Low-carbon Economy"*, op.cit. p.8.

[177] *ibid*, p.8.

[178] Nicholas Stern,."*Stern Review on The Economics of Climate Change" op.cit.*p.34-38.

- Economic instruments: measures that influence the price those consumers pay for a product or an activity, including market based instruments, tradable permits, deposit refunds, taxes
- Direct expenditure instruments: channeling expenditures directly to foster technology innovation, from R&D to infrastructure development to capacity building.
- Regulatory instruments: creating change via legal avenues, including liability, enforcement activity, competition and deregulation policy instruments.
- Institutional instruments: changes in the functions of government to promote change, including internal education efforts, internal policies and procedures.[179]

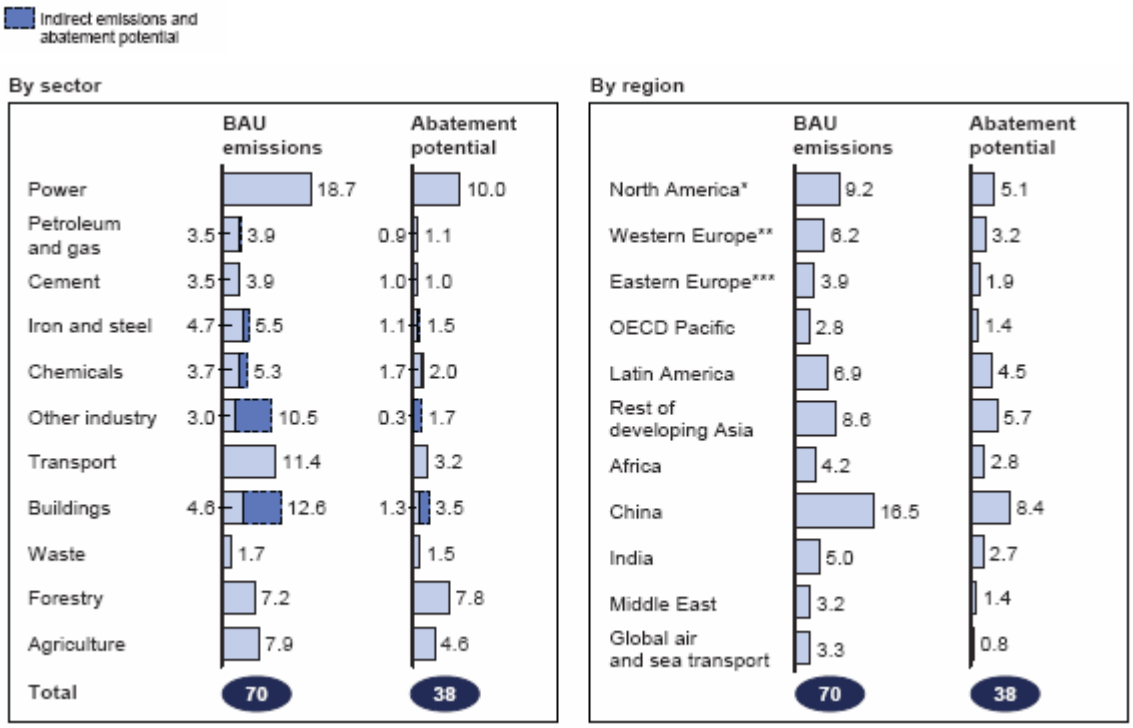
Public and private investments are indispensable in meeting the Kyoto targets. Several developed countries, which have ratified the Protocol, already implements domestic policies and regulations in order to reduce GHG emissions in accordance with the established targets. Nevertheless, it is difficult to deploy low-carbon energy technologies without financial incentives. Governments can shift to low-GHG technologies through appropriate tax incentives and subsidies.

The business community is essential for investigating technologies that will improve adaptation capacity. Thus, national and multinational companies have important role since they can develop and deliver large scale investments particularly in energy technologies and create new markets and associated revenue streams for energy-related products. In addition, forests and soils are natural sinks for carbon. Since developing regions have larger share of forestry and agriculture, they have high share of abatement potential. Moreover, cost of GHG emission reduction is much lower in the developing countries, as shown in the figure 4.7.

[179] See http://www.naturvardsverket.se/Documents/publikationer/620-8221-3.pdf

Figure 4.7 Emissions and Abatement Potential by Sector and Region

GtCO2e per year; 2030



* United States and Canada
** Includes EU27, Andorra, Iceland, Lichtenstein, Monaco, Norway, San Marino, Switzerland
*** Russia and non-OECD Eastern Europe
Note: To obtain the total BAU emissions, only direct emissions are to be summed up. To obtain total abatement potential, indirect emission savings need to be included in the sum.

Source: McKinsey Report, *"Pathways to a Low-Carbon Economy: Version 2 of the Global Greenhouse Gas Abatement Cost Curve",* January 2009.

4.6. Economic Implications of Climate Change

4.6.1. Cost of Inaction

The United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol aim to prevent irreversible global climate change. However, it can be claimed that actions taken so far are not successful to address climate change. For more realistic and permanent solutions, developed countries should decrease their GHG emissions whereas developing countries should take lessons from mistakes of develop countries and should not repeat them during their development efforts.

The environmental effectiveness of international and national climate change policies depends on stringency and implementation measures, including monitoring and compliance

procedures.[180] Climate change mitigation policy would be economically effective if it achieves a certain amount of GHG emission reduction at the lowest possible cost. Moreover, the results can be observed in the long term, even over generations. Therefore, there is a lag between the time of action and the results. The consequences of climate change, and vulnerability to these, are also distributed across regions and countries unevenly. According to the IPCC Report, the greatest risk of relative impacts is expected in regions and countries, where emissions are the lowest. Therefore, the least developed countries are expected to be affected the first and the most by the climate change. In this respect, distributional considerations affect policy decision-making.

There are many uncertainties concerning the future trends of GHG emissions, local impacts and economic consequences of climate change. In this respect, the uncertainty is one of the biggest problems in front of estimating the cost of inaction. Another problem is how to value losses not measured in the market, such as the disruption of societies. It is also challenging to model long-term economic growth and estimate whether it is likely to be affected by climate change. Moreover, it is difficult to decide what weight to put on climate change damages that occur in the future.[181] Taking into account these challenges, it is difficult to precise costs of inaction in monetary terms.

Addressing climate change brings costs, but there is a global consensus on the fact that there is much greater risk of failing to act. Hence, scientific uncertainties should not be used as excuse for inaction. Global actors try to build a global plan of action on climate change in ways that create more economic opportunities than risks.

Developing countries face robust economic growth that lead rapidly growing emissions. Kyoto exempts developing countries from any binding commitments to address emissions. The main priorities of these countries are economic and industrial development and increasing the social welfare. On the other hand, environmental protection is in line with the economic welfare and technological development. In this respect, economic growth is essential not only

[180] IPCC, Inter-governmental Panel on Climate Change, "*Summary for Policy Makers, In: Climate Change 2007 Mitigation, Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change",* 2007.
[181] Ottmar Edenhofer and Nicholas Stern, *"Towards a Global Green Recovery Recommendations for Immediate G20 Action"*, *op.cit*. pp. 44-45.

for poverty reduction and increasing living standards but also for the resources needed to invest and deploy new and clean technologies.

The UNFCCC estimates that US$ 200-210 billion will be necessary in 2030 in order to stabilize GHG emissions at today's levels. The incremental costs of low-carbon investments in developing countries are likely to be at least US$ 20-30 billion per year.[182] The economics of climate change and scientific researches indicate that the costs of inaction might outweigh heavily the costs of action against anthropogenic climate change. The world faces unprecedented economic crisis and the threat of a climate crisis at the same time. The economic activities around the world generate GHG emissions. Stern argues that the costs of doing nothing to tackle this problem depend on, "first, how fast GHGs will build up in the atmosphere if 'business as usual' is allowed to continue; second, what impact that build-up will have on climatic conditions around the world; and, third, what the impacts of the ensuing climate change will be and how we value those impacts".[183]

The cost of inaction on climate change is expected very high. The IPCC report warns about greater risks than previously for temperature increases between 1° and 3°C above pre-industrial levels. Hence without further policies, global emissions of GHGs are projected to grow about 40% by 2030 and 50% by 2050, resulting in an increase in global temperature of about 1.9° C by 2050 (with a range of 1.5° to 3.4° C, compared to pre-industrial levels) and further increases to 2100. Over the long term, with 'business as usual', the stock of GHGs is likely to continue to increase over 650 ppm CO2eq by the end of this century. GHG concentrations of 650 ppm CO2eq or more would entail an expected increase in global mean temperatures of more than 4°C, with a significant probability of increases above 5°C.[184] On the other hand, if we start today to reduce emissions and move onto a 450ppm CO2eq stabilization pathway, this is estimated to avoid roughly 0.5° C temperature increase by 2050 and would stabilize temperature increases over the long-term to about 2° C.[185]

The Stern Report demonstrates that serious economic consequences of the present trends on climate change are induced by human activity. The report claims that if about 1% of global

[182] UNFCCC, "Report on the analysis of existing and potential investment and financial flows relevant to the development of an effective and appropriate international response to climate change", *op.cit.*
[183] Ottmar Edenhofer and Nicholas Stern, *"Towards a Global Green Recovery Recommendations for Immediate G20 Action"*, *op.cit.* , p.43.
[184] *ibid,* p.43-44.
[185] IPCC, "*Climate Change: The Physical Science Basis*", IPCC Working Group I, Geneva, 2007

GDP invested in controlling GHG emissions; this can save an annualized loss on a broad measure of consumption equivalent to 5-20 % of GDP, due to climate change. Accordingly, all countries will be affected by climate change, but the poorest countries will suffer the earliest and the most. In this respect, he suggests integration of climate change and environmental considerations into development policies and increasing assistance and support of rich countries for the developing world. The report claims that if no action is taken, global warming could shrink the global economy by 20 %. According to Stern, the loss of climate change over the next two centuries, under business as usual, could be similar in scale to a loss of 15% of global consumption per head, now and forever.[186]

It is calculated that total cost savings achieved through implementing current policies for regional air pollution of the Kyoto Protocol is 2.5-7 billion Euros, which is on the order of half the costs of the climate policy (4-12 billion Euros).[187] The IPCC estimates that the global costs of stabilizing GHG concentrations would be between 5.5 % and -1% of annual GDP by 2050, depending on model assumptions and the stabilization target (ranging from 445 to 710 ppm CO2eq). On the other hand, Stern argues that to stabilize eventually at 500-550 ppm CO2eq would cost around 1% of GDP by 2050.[188]

According to the McKinsey Report, if the most economically rational abatement opportunities are pursued, the total worldwide cost is estimated to be €200 to 350 billion annually by 2030, which is less than 1 % of forecasted global GDP in 2030. This would help to hold global warming below the 2 °C threshold. Related to this estimation, the projected total upfront investment in abatement measures would be €530 billion in 2020 per year or €810 billion per year in 2030. This amount is about 5 to 6 % of BAU investments in fixed assets in each respective year. Therefore, global financial markets can realize the required investment within the long-term capacity.[189] Hence, there is international conclusion that the costs of action to climate change are likely to be much less than the costs of inaction. In this respect, taking strong and urgent action is rational, so it makes economic sense.

[186] Nicholas Stern, "*Stern Review on the Economics of Climate Change*", *op.cit.pp.* p.10.
[187] OECD, "*The Economics of Climate Change Mitigation: How to Build the Necessary Global Action in a Cost-Effective Manner?",* Working Document ECO/WKP(2009) 42, Paris, 2009.
[188] Nicholas Stern, "*Stern Review on the Economics of Climate Change*", *op.cit*. pp.12-15.
[189] McKinsey Report, *op.cit*. p.6.

V. GLOBAL CLIMATE CHANGE POLICIES UNDER THE UN

5.1. Early Actions on International Actions on Climate Change

Since the 19th century, it has been recognized that there is a correlation between various gases in the atmosphere and the surface temperature of the earth. The debates over climate change have been skeptic and there was no common consensus among the scientist. While several bodies of scientists urged policymakers to take prompt action to reduce GHG emissions, a small but influential group of greenhouse skeptics advised deferring action on the issue. The politics of climate change is closely related to energy and development policies, since the leading cause of increasing atmospheric GHG concentrations is fossil fuel consumption.

Climate change is a unique problem since it is caused by all human activities so that the consequences are uniform over the globe as a whole. Thus the threat of global warming requires coordinated global action. In this respect, in 1979 the World Climate Conference acknowledged the climate change phenomenon as a scientific issue which requires global level discussion for the first time. In line with the rise of public awareness on environmental issues in the 1980s, governments started to consider climate issues. The issue attracted attention of politics so that series of science and policy conferences have been held in Villach in 1985, Hamburg in 1987, and Toronto in 1988.[190]

In 1988, the United Nations General Assembly adopted resolution 43/53, proposed by the Government of Malta, urging "protection of global climate for present and future generations of mankind." In 1988 the governing bodies of the World Meteorological Organization and of the United Nations Environment Programme (UNEP) created a new body, entitled the Intergovernmental Panel on Climate Change (IPCC), in order to assemble and assess scientific information on climate change issues.

The IPCC confirmed in its First Assessment Report in 1990 that the threat of climate change was real and concluded that emissions of GHGs due to human activities shall be considered as

[190] In 1988, in the Toronto Conference, it was announced that the states should develop a framework convention on the law of the atmosphere and that global carbon dioxide emissions should be cut by 20% by 2005.

one of the most significant environmental problems caused by humankind.[191] The Second World Climate Conference was held in 1991 in Geneva and it called for the creation of a global treaty. In response, the General Assembly passed resolution 45/212, and launched negotiations on a convention on climate change, to be conducted by an Intergovernmental Negotiating Committee (INC).[192]

5.2. UN Framework Convention on Climate Change: The Basis of International Action on Climate Change

In 1990, the United Nations General Assembly, in cooperation with the UNEP and WMO, established the Intergovernmental Negotiating Committee (INC/FCCC) in order to negotiate the United Nations Framework on Climate Change (UNFCCC). Taking the IPCC's First Assessment Report[193] as the scientific basis for action, the INC meet in two parallel groups. The first group focused on legal and institutional mechanisms while the other focused on issues related to commitments, including limiting and reducing GHG emissions, protecting and enhancing sinks and reservoirs, financial mechanisms, technology transfer and common but differentiated responsibilities of countries. Setting binding commitments was the main controversial issue in the process of preparation of the UNFCCC. Countries would agree either on a comprehensive framework that included specific targets and timetables or a step-by-step approach where a framework agreement with general obligations to be followed up by a more comprehensive protocol or legal instrument.

The United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1992 at the Earth Summit in Rio de Janeiro, known as the "Earth Summit". The Convention declared an ultimate goal of stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. This has been the turning point for non-binding framework for intergovernmental efforts in

[191] The role of this report has been very important in the establishment of the Intergovernmental Negotiating Committee (INC) for the preparation of a Framework Convention on Climate Change under the United Nations. More than 500 scientists have been involved in the preparation of this report.

[192] UNFCCC, "*Uniting on Climate: a Guide to the Climate Change Convention and the Kyoto Protocol*", 2007, pp 10-12.

[193] In 1995, the IPCC published its 2nd Assessment Report which provided the impetus for the negotiations which have been finalized by the adoption of the Kyoto Protocol in 1997. The Third IPCC Assessment Report has been finalized in 2001 and the 4th Assessment Report was published in 2007.

addressing climate change. Nevertheless, the countries hesitated to have binding commitments, due to their ambitious development goals.[194]

The Convention was opened for signature in the Rio Conference and entered into force on 21st of March 1994. The UNFCCC was signed by 154 countries and the EC during the Rio Summit. It has been signed so far by 191 States and the European Community. The Convention requires the parties to take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse outcomes cost-effectively. The parties are required to take into account the benefit of present and future generations, on the basis of equity, and in accordance with their common but differentiated responsibilities.[195]

Since the UNFCCC is universally accepted as the basis of international politics on climate change, the countries, as sovereign states, negotiate further steps on fight against the climate change under it. The Convention provided an objective, basic principles and obligations, which crated a basis for further negotiations on addressing climate change. Moreover, the Convention established procedures and institutions, which provided the framework for political and diplomatic activities for the present and future.

5.2.1. Objective, Principles and Obligations of the UNFCCC

The main objective of the UNFCCC is to stabilize greenhouse gas concentration at a level that would prevent dangerous anthropogenic interference with the climate system. This "ultimate objective" of the Convention is stated in the Article 2 of the UNFCCC as:

> *"The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a timeframe sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food*

[194] Niklas Hoehne, "*What is Next After the Kyoto Protocol? Assessment of Options for International Climate Policy Post 2012"*, Techne Press, the Netherlands, 2006.
[195] See www.unfccc.int

production is not threatened and to enable economic development to proceed in a sustainable manner."[196]

Although the Convention does not attribute specific objective, which allows for different interpretations, the need for adaptation and mitigation of climate change is acknowledged by the parties. Article 3 of the Convention establishes the principles of equity and precaution as the fundamental basis of all policies under the Convention:

"Common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects of thereof."[197]

In this respect, policies and measures should be comprehensive covering all sources, sinks and reservoirs of GHGs and means of adapting to climate change. Special attention is drawn to countries that are most affected by climate change or by measures to combat global warming. Parties are advised to promote sustainable development and to ensure an open international economic system without distinguished restrictions on international trade. However, these principles are not reassigned to legally binding targets of reducing GHG emissions, but rather introduced reporting obligation is introduced for the industrialized countries.

According to Article 4.1 of the Convention, all Parties have certain general commitments[198]:

- To prepare national inventories of greenhouse gas emissions
- To implement measures to mitigate climate change
- To promote and cooperate in the development, application and diffusion, including transfer of technologies, practices and processes that reduce greenhouse gas emissions
- To preserve sinks and reservoirs of greenhouse gases
- To cooperate in preparing for adaptation to the impacts of climate change
- To promote and cooperate in research on climate change
- To exchange information related to climate change

[196] UNFCCC,1992, Article 2
[197] UNFCCC,1992, Article 3
[198] UNFCCC,1992, Article 4.1

- To promote and cooperate in education, training and public awareness related to climate change
- To report information related to the above in "national communications"

All Parties to the Convention, which have ratified, accepted, approved or acceded to it, are subject to general commitments to respond to climate change. Parties are obliged to accumulate an inventory of their greenhouse gas emissions, and submit National Communication Reports concerning actions they take to implement the Convention. These reports include:[199]

• Climate change mitigation measures, i.e. measures to control GHG emissions
• Provisions for developing and transferring environmentally friendly technologies
• Provisions for sustainable managing carbon 'sinks' (a term applied to forests and other ecosystems that can remove more greenhouse gases from the atmosphere than they emit)
• Preparations to adapt to climate change
• Plans for climate research, observation of the global climate system and data exchange
• Plans to promote education, training and public awareness relating to climate change.

Mainly due to the US resistance and objection, the parties do not have legally binding target, to cut GHG emissions under the Convention, which does not provide provisions for non-compliance. Since the system is based on voluntary cooperation, there is no enforcement mechanism, except political pressures. Decisions under the UNFCCC are taken by the "Conference of the Parties" (COP) by consensus of all parties. In the clash of interests of the states, it is difficult to have an agreement. Amendments and Annexes may be adopted by three-quarters majority of the Parties.

The Convention establishes mechanism for the resolution of conflicts and problems that might arise in its implementation.[200]Accordingly, disputes between Parties are to be settled by negotiations or other peaceful means, including resort to the International Court of Justice or arbitration, in case all the Parties involved have agreed to such a procedure. Otherwise, the dispute is to be submitted to conciliation.

[199] UNFCCC, "*A Guide to the Climate Change Convention Process Climate Change*", Secretariat Bonn, 2002. See also www.unfccc.int
[200] UNFCCC, 1992, Article 14

5.2.2. Parties and Country Groups of the UNFCCC

In addition to the general commitments, certain groups of countries are attributed additional obligations or rights under the UNFCCC. In order to achieve the "ultimate objective" by its parties, which are different in political, social and development terms, the UNFCCC is based on the principle of common but differentiated responsibilities and capabilities of Parties. Accordingly, countries are categorized into three groups, differentiating the obligations or commitments under the Conventions and later the Kyoto Protocol.[201]

Annex I Parties: This category contains the industrialized countries that were members of the Organization for Economic Co-operation and Development (OECD) in 1992, as well as countries with "economies in transition" (EITs), including the Russian Federation, Baltic States and several other Central and Eastern European countries. Annex I Parties are committed to adopt national policies and take measures for reducing their greenhouse gas emissions individually or jointly to 1990 levels by the year 2000.[202] They are obliged to set an example of firm resolve to deal with climate change. EIT Parties are granted "flexibility" in implementing commitments, on account of recent economic and political upheavals in those countries.

Annex II Parties: This category includes the countries that are members of the Organization for Economic Co-operation and Development (OECD) but not the EIT Parties. The Parties of Annex II have the further commitment to provide new and additional financial resources to help developing country Parties in complying with their obligations.[203] In addition, Anne II Parties are assigned to "take all practicable steps" to promote the development and transfer of environmentally friendly technologies to EIT Parties and developing countries. In this framework, the financial mechanisms of the Convention channel the funding provided by Annex II Parties.

Non-Annex I Parties: This group is composed of the countries, which are not included in Annex I, including all newly industrialized countries and developing countries. The Convention recognizes vulnerability of some countries to the adverse impacts of climate

[201] UNFCCC, *"A Guide to the Climate Change Convention Process Climate Change", op.cit.*
[202] UNFCCC, 1992, Article 4.2
[203] UNFCCC, 1992, Article 4.3, 4.4, 4.5

change. Non-Annex I parties are eligible for funding for the implementation of their general commitments.[204]

Economies in transition are offered a certain degree of flexibility in implementing their commitments; particularly they are allowed to choose a base year other than 1990.[205] The Convention promotes activities that satisfy special needs and concerns of the vulnerable countries, such as investment, insurance and technology transfer. The United Nations classified 48 Parties as least developed countries (LDCs), which are granted funds to respond to climate change and adapt to its adverse effects due to their limited capacity. Accordingly, all parties are invited to take into account the special situation of LDCs concerning funding and technology transfer activities.

Table 5.1 Countries Included in Annex

Countries included in Annex I	
Australia	Lichtenstein
Austria	Lithuania*
Belarus*	Luxembourg
Belgium	Monaco
Bulgaria*	New Zealand
Canada	Norway
Croatia*	Poland*
Czech Republic*	Portugal
Demark	Romania*
Estonia*	Russian Federation*
European Community	Slovakia*
Finland	Slovenia*
France	Spain
Germany	Sweden
Greece	Switzerland
Hungary*	The Netherlands
Iceland	Turkey
Ireland	Ukraine*
Italy	United Kingdom of Great Britain
Japan	and Northern Ireland
Latvia*	United States of America

*Countries with economies in transition (EIT Parties)

Source: UNFCCC

[204] UNFCCC, 1992, Article 11
[205] UNFCCC, 1992, Article 4.6

5.2.3. Institutions of the UNFCCC

Under the UNFCCC the institutions and procedures are designed to support a constant development and implementation of the regime, since the international regime on climate change is process oriented. In this respect, the milestone of the international climate regime is the UNFCCC, which has established the institutional framework and procedures that can lead further elaboration of the provisions of the Convention by the Parties. The Convention established the Conference of the Parties (COP)[206] as the supreme decision-making body, which meets every year to review the implementation of the Convention, adopts decisions to further develop the Convention's rules, and negotiate new commitments. The main responsibilities of COP are;[207]

- reviewing the implementation of the Convention and the adequacy of committeemen's,
- promoting of the development and refinement of methodologies for GHG inventories,
- assessing the overall effectiveness of the Convention
- fulfilling any other function required for the achievement of the objective of the Convention.

The Convention established two subsidiary bodies, which meet at least twice a year to steer preparatory work for the COP. The Subsidiary Body for Scientific and Technological Advice (SBSTA) recommends to the COP on matters of science, technology and methodology, including guidelines for improving standards of national communications and emission inventories. On the other hand, the Subsidiary Body for Implementation (SBI)[208] helps to assess and review the Convention's implementation, mainly by analyzing national communications submitted by Parties.

The UNFCCC Secretariat, which is based in Bonn since 1996, provides the administrative support for functioning of the Convention and its bodies. The Secretariat supports all institutions involved in the climate change process, particularly the COP, the subsidiary bodies and their Bureau. Moreover, the Secretariat makes arrangements for the sessions of the

[206] UNFCCC, 1992, Article 7
[207] UNFCCC*, "Uniting on Climate: a Guide to the Climate Change Convention and the Kyoto Protocol*", 2007, p.16
[208] The SBI has the responsibility to review the financial assistance given to the non-Annex I Parties and gives advice to the COP on the financial mechanisms operated by the Global Environment Fund (GEF). The SBI provides advice to the COP on budgetary and administrative matters as well. For further information on the working of SBI, see: UNFCCC website www.unfccc.int/essential_background/convention/convention_bodies/items/2629txt.php

Convention bodies, helps Parties to fulfill their commitments, compiles and disseminates data and information, and confers with other relevant international agencies and treaties.[209]

In activities related to vulnerability and adaptation, technology transfer, capacity building and climate change research, the Secretariat works in collaboration with number of UN organizations and agencies, including the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP) and World Meteorological Organization (WMO). Moreover, the Secretariat cooperates with national or international non-governmental organizations (NGOs), trade associations and various other non-statutory bodies.

The financial mechanism of the UNFCCC is run by the Global Environment Facility (GEF), which channels funds to developing countries on a grant or loan basis. With the aim of supporting developing countries for struggle with environmental issues, the GEF was established by the UNDP, UNEP and the WB in 1991 and was re-structured in 1993, following the Rio Conference. The GEF is an independent financial organization to fund developing country projects in the area of climate change, biodiversity, protection of the ozone layer and international waters, which have global environmental benefits. The GEF funds are mainly aimed at meeting the objectives of international environmental conventions by developing countries.[210]

Apart from the UN agencies, another crucial source of information on climate change is Intergovernmental Panel on Climate Change (IPCC), which was established in 1988 in order to provide scientific, technical, and socioeconomic advice to the world community. The IPCC was established jointly by the World Meteorological Organization (WMO) and the United Nations Environment Program (UNEP) as a follow up to the 1987 report Our Common Future, which stated that sustainable growth is a prerequisite for the fight against poverty and environmental degradation. The main task of the IPCC is to assess available scientific information on climate change while assessing environmental and socioeconomic impacts of climate change and formulating response strategies. Every five years the IPCC publishes comprehensive progress reports on the state of climate change science and also prepares

[209] UNFCCC, *"Uniting on Climate - a Guide to the Climate Change Convention and the Kyoto Protocol", op.cit.* p.16.
[210] *Ibid,* p.17.

Special Reports or Technical Papers on specific issues upon the requests from the COP or SBSTA.

5.3. Kyoto Protocol

The legal basis of the Kyoto process has been established by the UNFCCC, adopted on 9 May 1992 in New York. The Convention neither contains severe and binding commitments nor specifies a time frame for collective action. Moreover, it is vague about what a safe level means. Nevertheless it has been merely a framework in which further action still needs to be specified for addressing climate change. Being aware of the fact that Convention would not be sufficient to tackle climate change and its adverse effects, countries came together at the first Conference of the Parties (COP 1), which was held in Berlin in 1995.[211]

Countries decided to launch a new round of talks, known as the Berlin Mandate, to discuss firmer and more detailed commitments for industrialized countries. Within this Mandate, the COP initiated a process to strengthen the commitments of Annex I Parties without introducing any new commitments for the Non-Annex I Parties. The negotiations of the Ad Hoc Group on Berlin Mandate resulted in the Kyoto Protocol, a binding Protocol, which was adopted at the third annual meeting of Conference of Parties (COP3) in 1997 in Kyoto, Japan.[212]

Due to the controversial interests of the states, the Kyoto Protocol could be substantially completed in 2001 after years of negotiations. The Kyoto Protocol could not answer all the desires of countries so that the 7th COP, in Marrakech in 2001, agreed on a substantive package further clarifying the conditions of the implementation of the Kyoto Protocol. In order to ensure the involvement of developing countries, the Marrakech Accords[213] introduced new tools, such as Framework on Capacity Building, which aims to promote capacity building of the developing countries related to the implementation of the Convention.

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[211] In 1995, the Intergovernmental Panel on Climate Change has made the serious warning that "the balance of evidence suggests a discernible human influence on global climate" and that "climate will change due to anthropogenic causes". This warning accelerated the negotiations of the Kyoto Protocol. See IPCC, Second Assessment, 1995, p. 22.

[212] UNFCCC, *"Uniting on Climate: a Guide to the Climate Change Convention and the Kyoto Protocol*", *op.cit.,* p.12.

[213] The Marrakesh Accords consisted of a package of draft decisions on the details of flexibility mechanisms, reporting and methodologies, land use, land-use change and forestry (LULUCF) as well as compliance with the Kyoto Protocol. All of these were to be adopted during the first COP/MOP. There has also been support for the developing countries such as capacity building, technology transfer, responding to the adverse effects of climate change and funding.

In addition to this, the Framework on Transfer of Technology was initiated in order to develop effective actions to increase and improve transfer of and access to environmentally sound technologies and know-how. Moreover, Least Developed Country Fund and Adaptation Fund have been introduced in order to accumulate additional financial resources for the developing countries.

After the clarification of the detailed issues in Marrakech Accords, countries could start to ratify the Protocol. The Protocol would only enter into force if 55 Parties would ratify it and if the ratifying Annex I countries would be responsible for 55 % of the Annex I CO2 emissions of 1990. Being responsible for 36% of the emissions in 2001, the US rejected to be part of the Protocol. The US claimed that Kyoto Protocol would impose an excessive burden on US industries and rejected to exempt developing countries, particularly China and India, from mandatory emissions targets. The US admitted the need to reduce GHG emissions, but not through a single international agreement.[214] Therefore, the Russian Federation, which was responsible for 17%, had the decisive vote so that the Kyoto Protocol entered into force on 16th of February 2005 with the signature of Russia.

The Kyoto Protocol provides legal framework for remedial and precautionary action against possible impacts of climate change by supplementing and strengthening the Convention. In this respect, only the UNFCCC Parties could become Parties to the Protocol, therefore, the Conference of the Parties serves as the Meeting of the Parties (MOP) to the Protocol.

The Kyoto Protocol renames Annex I Parties under the UNFCCC as Annex B. The Protocol encourages the parties to take the first steps towards sustainable energy consumption, use of clean technologies and sustainable land management practices in order to mitigate the impacts of climate change. According to Article 3 of the Protocol, Annex 1[215] countries are obliged to reduce their GHG emissions by about 5% levels between 2008 and 2012 compared 1990.

[214] Thomas Gale Moore, *"In Sickness or in Health: The Kyoto Protocol versus Global Warming"*, Hoover Institute Press, Stanford University, 2000, pp.67-70.

[215] Annex1 countries are Germany, USA, EU, Australia, Austria, Belgium, Belarus, Bulgarian, Czechoslovakia, Denmark, Estonia, Finland, France, England and North Ireland, Holland, Ireland, Spain, Sweden, Switzerland, Italy, Iceland, Japan, Latvia, Lithuania, Luxemburg, Canada, Hungary, Norway, Poland, Portugal, Romaine, Russia, Turkey, Ukraine, New Zelland and Greece (Kyoto Protocol, 1998). Non-Annex countries are Germany, USA, EU, Australia, Austria, Belgium, Denmark, Finland, France, Holland, England and North Ireland, Ireland, Spain, Sweden, Switzerland, Italy, Iceland, Japan, Luxemburg, Canada, Norway, Portugal, Turkey, New Zealand and Greece.

> *...their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their assigned amounts, calculated pursuant to their quantified emission limitation and reduction commitments inscribed in Annex B and in accordance with the provisions of this Article, with a view to reducing their overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012.*[216]

The Protocol requires the 5% reduction of GHGs for averaged across all Annex B nations[217] which should not exceed the assigned target in the first commitment period between 2008 and 2012. The specific commitments vary among countries resulting in country specific 'assigned amounts', for example, some countries are allowed to increase emissions such as Australia (+8%), while others should make reductions. On the other hand, the EU committed itself to reduce the emission reduction 8% from its 1990 emission levels. In order to meet this binding commitment, industrialized countries can reduce part of their emissions domestically, while purchasing emission reductions from developing countries, through the Clean Development Mechanism, or from countries with economies in transition (EITs), through Joint Implementation or International Emissions Trading. Through setting emissions targets, Kyoto Protocol allocated permits that worth over $2 trillion, thus created the ultimate global market for managing future of the environment.[218]

5.3.1. Key Players of International Climate Policies of Kyoto Protocol

In the Kyoto Process, governments are the decisive players since only they have competence to adopt the Protocol. The negotiating behavior and positioning of the states are shaped by their perceived and real interests. For example, depending on differing "polluter interests", dependence on production and use of fossil fuels differs considerably. Moreover, level of vulnerability of counties to the impacts of climate change as well as their interest in climate change mitigation and adaptation varies. It is also vital to consider the availability of affordable options to reduce GHG emissions and adapt to climate change. Moreover, policies and commitments of the countries are also shaped by the factors related indirectly to climate change, such as cultural pre-determinations and institutional structures. Countries, which have

[216] Kyoto Protocol, 1997, Article 3.1
[217] Kyoto Protocol, 1997, Article 2.3
[218] David Victor, *"The Collapse of the Kyoto Protocol and the Struggle to Slow Global Warming"*, Princeton University Press, 2001.

polluter interests, would be less enthusiastic about elaborating severe action to reduce GHG emissions. On the other hand, countries which are greatly affected by the impacts of climate change and which have stronger helper interests would support such action.[219]

More than 170 countries and hundreds of non-governmental and inter-governmental organizations were involved in the international negotiations of the Kyoto Protocol. Nevertheless, participating countries did not have equal impact on shaping the Kyoto Process. Based on the respective special interest, several country groupings were established in the process:[220]

- The European Union and its Member States
- The US, Japan and other non-EU OECD countries
- Russia and other countries in transition to a market economy (CEITs)
- Oil-exporting developing countries of the Organization of Petroleum Exporting Countries (OPEC)
- The developing countries bound together in the Alliances of Small Island States (AOSIS)
- The majority of developing countries (including China and India)

During the climate negotiations party groupings and coalitions are important to provide ground and support. For instance, the Umbrella group[221] is composed of the USA, Canada, Japan, Australia, Norway, New Zealand and the Russian Federation while the G77[222] contains developing countries with China and Saudi Arabia. On the other hand, the group of

[219] Sebastian Oberthür and Ott, Hermann, *"The Kyoto Protocol: International Climate Policy for the 21st Century"*, Springer, Heidelberg, 1999, pp.13-14.
[220] UNFCCC, *"Uniting on Climate: a Guide to the Climate Change Convention and the Kyoto Protocol", op.cit.* p.27.
[221] The Umbrella Group and JUSSCANNZ (Japan, the US, Switzerland, Canada, Australia, Norway, New Zealand) are also Annex I Parties. The JUSSCANNZ includes Switzerland while the Umbrella Group includes the Russian Federation and Ukraine which support unrestricted emissions trading. This group supports flexibility and cost effectiveness, nevertheless, the members have different national circumstances. See Frahana Yamin, and Joanna Depledge, "*The International Climate Change Regime: A Guide to Rules, Institutions and Procedures",* Cambridge University Press, Cambridge, 2004, p.46.
[222] Within the climate regime the G77 and China is the largest negotiating coalition, which established in 1964, aims to redress the unequal balance of global economic and political power in favor of developing countries. Under the Convention G77 countries, among these China, Brazil, India and Saudi Arabia are among the most powerful states, are all non-Annex I Parties.

Association of Small Island States (AOSIS)[223] represents the countries that face the risk of being drowned by sea level rise. Besides there is also the EU group, which is one of the most powerful and driving groups.

The US and the EU are two major actors of international environmental development and climate change policies. Initially, the US was considered as a potential leader to reduce the GHG emissions, nevertheless it opposed constantly to timetables and specific targets. On the other hand, the US opposed to a global climate change fund and the technology transfer from rich to poor countries.[224]

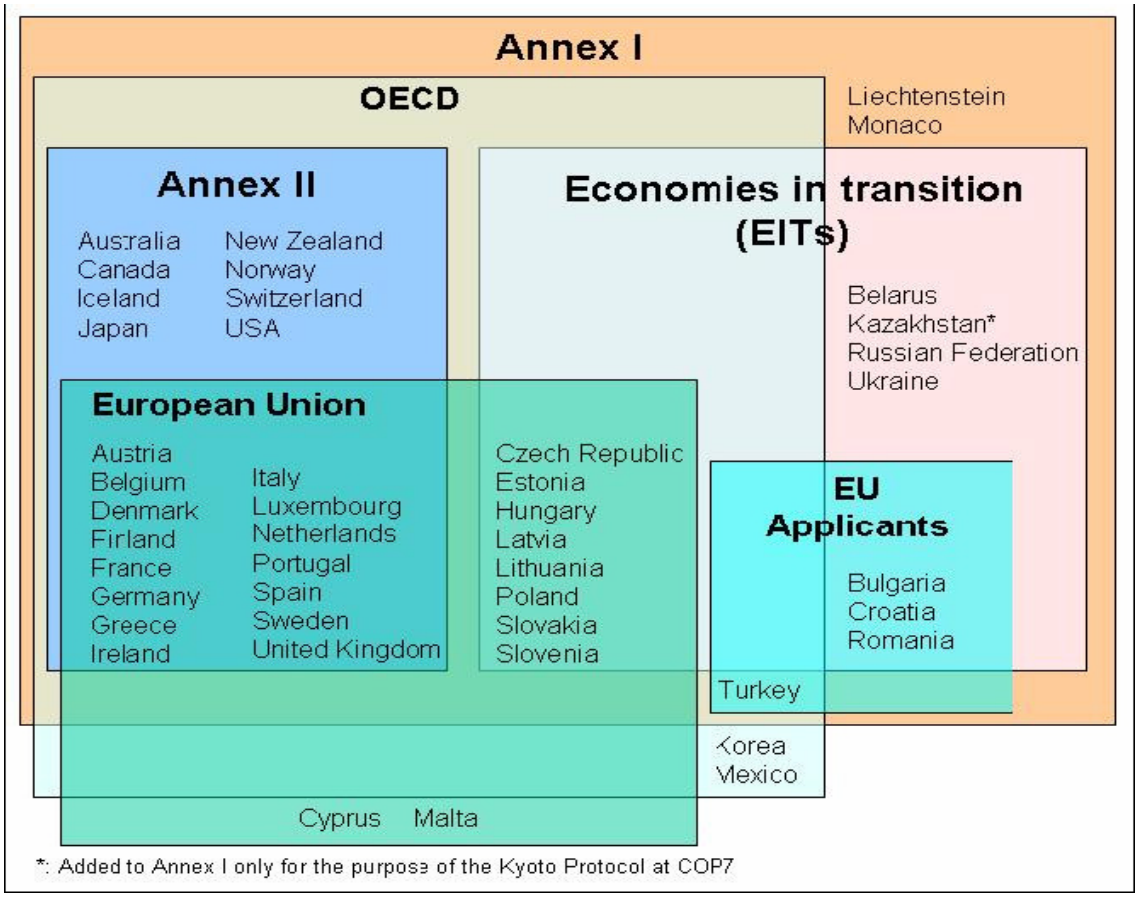
Despite the US opposition, the EU achieved to build some binding targets for the industrialized countries. Following the US rejection to the Kyoto Protocol, the EU became a unifying actor for the international climate change policy while on the other hand convincing Russia and some other countries to ratify the Kyoto Protocol.[225]

5.3.2. Country Groups and Commitments under the Kyoto Protocol

Under the Protocol, Annex I and non-Annex I parties division of the UNFCCC has been further clarified. The Kyoto Protocol renames the Annex I of UNFCCC as Annex B. Hence it did not introduce a new group of countries, but updated Annex I by adding the countries that applied to be included and whose geographical borders changed by that time. In the same manner, it deleted the name of the countries which did not ratify the Convention at the time of adoption of the Kyoto Protocol. (Figure 5.1)

[223] The members of the AOSIS are composed of the states, which are highly vulnerable to climate change due to the sea level rises as being one of the impacts of climate change. The group has been established in 1990 during the Second World Climate Conference. Most of the members of AOSIS are also members of the G77.
[224] Alexander Ochs and Marcus Schaper, "Conflict or Cooperation? Transatlantic Relations in the Environmental Field", in *European Union Studies Association (EUSA) Biennial Conference,* March 31-April 2, 2005.
[225] *ibid*

Figure 5.1 Country Groups under the Kyoto Protocol



Source: Hoehne, Niklas, *"What is Next After the Kyoto Protocol? Assessment of Options for International Climate Policy Post 2012"*, Techne Press, the Netherlands, 2006.

Although the Kyoto Protocol attributes new commitments to the Annex I Parties, it confirms the general commitments of the UNFCCC for non-Annex I Parties without modifying them. Under the Kyoto Protocol, internationally-agreed mitigation targets apply only to industrialized countries and do not extend beyond 2012. Therefore, the Protocol provides specific commitments for industrialized countries, the so-called Annex B countries, for the 2008–2012 commitment period by setting the emission targets relative to the emissions of the base year 1990. It targets to reduce aggregated emissions of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), hydro fluorocarbons (HFCs), per fluorocarbons (PFCs) and sulphur hexafluoride (SF_6) together by at least 5% in the first commitment period.[226]

[226] Niklas Hoehne, *"What is Next After the Kyoto Protocol? Assessment of Options for International Climate Policy Post 2012"*, Techne Press, the Netherlands, 2006.

In addition, individual developed countries are committed themselves to limitation or reduction targets. Therefore, Annex I Parties agreed relative commitments ranging from 8% decrease to 10% increase for different countries, accounting an average of 5% below 1990 levels.[227] Moreover, the EU declared to reduce emissions up to 8% from 1990 in the period 2008-2012, while some countries like Australia and Iceland were allowed to increase emissions by varying amounts up to 10%.

Under the Kyoto Protocol countries may implement the commitments jointly as a group, as the European Union does. The EU has overall target but within the Union national targets are negotiated to provide the basis for the assessment of individual compliance with the Kyoto Protocol.

The Protocol does not impose quantified emission limitation commitments for developing countries, the so called non-Annex I countries, including China, India, Brazil, Mexico, Indonesia, and Nigeria.[228] Despite not being obliged, the non-Annex I countries are always encouraged to reduce their emissions on voluntary basis. As being a part of the commitment regime in the frame of the UNFCCC and the Kyoto Protocol, developing countries have commitments such as implementation of policies and measures and regular reporting of major efforts to limit emission growth. Moreover, the developing countries are encouraged to be active in the implementation of climate-friendly projects through the Clean Development Mechanism (CDM).[229]

Countries can move into Annex I upon the decision of the COP by consensus. In this respect, Kazakhstan applied to be included in Annex I while Turkey applied to be excluded from Annex I. Since the consensus could not be reached at the COP, inclusion of Kazakhstan[230] in Annex I and the exclusion of Turkey have been blocked.

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[227] Barrett, S. and R. Stavins, "Increasing Participation and Compliance in International Climate Change Agreements" in *International Environmental Agreements: Politics, Law and Economic,* Kluwer Academic Publishers, Netherlands, 2003, pp: 349–376.

[228] Frahana Yamin, and Joanna Depledge, "*The International Climate Change Regime: A Guide to Rules, Institutions and Procedures", op.cit.*, pp.15.

[229] The CDM mechanism, which is operational since 2006, has already registered more than 1,000 projects and is expected to produce CERs amounting to more than 2.7 billion tonnes of CO2 equivalent in the first commitment period of the Kyoto Protocol, 2008–2012. For further information please see;http://cdm.unfccc.int/about/index.html

[230] As a non-Annex Icounrty, Kazakhstan wanted to take place in the Annex B to the Kyoto Protocol with a base year of 1992. In COP12, base year has been set as 1992 for Kazakhstan butit has been stated that it first needs to ratify the Protocol in order to take place in Annex B (FCCP/CP/2006/L.2).

Table 5.2 Members of Annex I and their commitment under the Kyoto Protocol (Annex B)

Country	Member of Annex I	Member of Annex II	Economy in transition	Commitment inscribed in Annex B (within paren-thesis the outcome of the EU burden sharing agreement)
Australia	X	X		108
Austria	X	X		92 (87)
Belarus	X		X	****
Belgium	X	X		92 (92.5)
Bulgaria	X		X	92
Canada	X	X		94
Croatia	X*		X	95
Czech Republic	X*		X	92
Denmark	X	X		92 (79)
Estonia	X		X	92
European Community	X	X		92
Finland	X	X		92 (100)
France	X	X		92 (100)
Germany	X	X		92 (79)
Greece	X	X		92 (125)
Hungary	X		X	94
Iceland	X	X		110
Ireland	X	X		92 (113)
Italy	X	X		92 (93.5)
Japan	X	X		94
Kazakhstan	X**		X	To be negotiated
Latvia	X		X	92
Liechtenstein	X*			92
Lithuania	X		X	92
Luxembourg	X	X		92 (72)
Monaco	X*			92
Netherlands	X	X		92 (94)
New Zealand	X	X		100
Norway	X	X		101
Poland	X		X	94
Portugal	X	X		92 (127)
Romania	X		X	92
Russian Federation	X		X	100
Slovakia	X*		X	92

Slovenia	X*		X	92
Spain	X	X		92 (115)
Sweden	X	X		92 (104)
Switzerland	X	X		92
Turkey	X	***		****
Ukraine	X		X	100
United Kingdom	X	X		92 (87.5)
United States of America	X	X		93

* Added to Annex I at the third Conference of the Parties in Kyoto 1997 (COP 3)
** Added at COP7 only for the purpose of the Kyoto Protocol (see FCCC/CP/2001/13/Add.4, section V.C)
*** Deleted from Annex II by decision 26/CP.7
**** No limit specified. Country had not ratified the Convention when Kyoto Protocol was adopted
Source: UNFCCC

5.3.3. Kyoto Mechanisms

In order to mitigate emissions, governments can initiate variety of national policies and measures including, regulations and standards, voluntary agreements, research and development, information instruments and market-based instruments, such as emission taxes and charges, tradable permits, subsidies and financial incentives. Moreover, countries can reach their emission targets by trading emission allowances with other countries or by implementing reduction projects in other Annex I countries, namely Joint Implementation or in developing countries, namely Clean Development Mechanism. However, the Convention and the Protocol are not prescriptive, leaving the question of how to reduce emissions and implement commitments to each Party.

The innovative element of the Protocol is the introduction of flexible mechanisms, which allow Annex I countries to meet their GHG targets by purchasing emission reductions either from financial exchanges by Emissions Trading Scheme, or projects that reduce emissions in non-Annex I economies.[231]

The flexible mechanisms, namely 'Joint Implementation'[232], 'Clean Development Mechanisms'[233] and 'Emissions Trading'[234], help reducing emissions where it is cheapest.

[231] Thomas Gale, *"In Sickness or in Health: The Kyoto Protocol Versus Global warming"*, 2000,, pp. 23-25.
[232] Kyoto Protocol, 1997, Article 6 See http://unfccc.int/resource/docs/convkp/kpeng.pdf
[233] Kyoto Protocol, 1997, Article 12
[234] Kyoto Protocol, 1997, Article 17

Such international cooperative modes of emission abatement contribute greatly to reducing economic burden of countries with big abatement costs under the set of specific targets. However, major reductions of GHGs will have to be achieved domestically by each party so these mechanisms are supplemental.

Countries need to implement additional policies while taking more advantage of the flexibility mechanisms to achieve their emission targets under the Kyoto Protocol.[235] In this respect, a well functioning Joint Implementation and the Clean Development Mechanism market could encourage many countries to engage in a global agreement, which promotes benefits to developing countries of transferred technology and the benefits to developed countries from cost-effective emission reduction projects. Moreover, in order to offset emissions, the Kyoto allows creation of carbon sinks[236] by planting new forests, namely afforestation and reforestation instead of deforestation as alternative ways of reducing the emissions.[237] Deforestation accounts 18% of global CO2 emissions, which is more than the share of the global transport sector.[238]

Through the flexible mechanisms, the Kyoto protocol promotes formulating environmentally sensitive action as a matter of cost-efficiency rather than ethical or moral concern. Under the Kyoto Protocol, the cost of meeting emission reduction commitments is estimated to be billions of dollars. Market and flexible mechanisms reduce the cost of compliance so encourage the long-term engagement of the global community to combat global climate change.

5.3.3.1. Joint Implementation (JI)

Under Joint Implementation, Annex I Parties implement emission-reducing project in another Annex I Party and generate emission reduction units (ERUs) in order to meet its own Kyoto

[235] Farhana Yamin and Joanna Depledge, *"The International Climate Change Regime: A Guide to Rules, Institutions and Procedures"*, op.cit. pp.16.
[236] Carbon sink is a natural reservoir which absorbs CO2 from the atmosphere. The major sinks are oceans, plants and other organisms which use photosynthesis to remove carbon from the atmosphere and release oxygen instead. The Parties were given the right to reduce their emissions through increasing the amount of carbon sinks in the land use, land-use change and forestry sector. However, only certain activities are allowed to be utilized with this aim. See UNFCCC, "*Caring for Climate Change: A guide to the Climate Convention and the Kyoto Protocol",* Climate Change Secretariat (UNFCCC) Bonn, 2005.
[237] Kyoto Protocol, 1997, Article 3.3
[238] Nicholas Stern, "*Stern Review on The Economics of Climate Change"*, *op.cit*, pp.25.

target.[239] Hence, the concept of Joint Implementation is based on classical economic theory, which claims that measures to limit GHG emissions should preferably be taken where they are cheapest or even profitable. Mitigation costs differ among countries because of differences in the efficiency of energy use. Therefore, emission reduction costs in developing countries and economies in transition are lower than developed countries. In this respect, developed countries are granted credits for carrying out climate protection projects abroad, in order to save on resources and maximize emission reductions. In this structure, both parties are in profit and benefit from this deal. Accordingly, the investing country acquires CO2 credits at a lower cost than taking action at home while the receipt country receives additional funds, modern technology and know-how.

According to Article 6.1 of the Kyoto Protocol, any Annex I Party "may transfer to, acquire from, any other such Party emission reduction units resulting from projects for the purpose of meeting its quantified targets".[240] While the projects may be carried out in any sector of the economy, including the enhancement of sinks, the Article 6 of the Protocol limits the use of JI to industrialized countries, which have emission ceilings. This limitation aims to ensure that "paper emissions" created by JI projects will not have negative effect on climate system.

5.3.3.2. The Clean Development Mechanism (CDM)

The Kyoto Protocol aims emissions reductions at least cost. In this respect, the Clean Development Mechanism (CDM) is an important tool for the least cost target since the lower efficiency of many carbon-based processes in developing countries facilitates to reduce emissions cheaper in these countries.

The Clean Mechanism is considered as "Kyoto surprise"[241] since it has emerged in the final days of COP 3 in 1997 in Kyoto. The CDM establishes a multilateral framework for project based joint implementation between industrialized and developing countries. Developing countries in general benefit from additional financial and technological resources transferred through the CDM. This has been welcomed by the industrialized countries that wanted to

[239] UNFCCC Joint Implementation http://ji.unfccc.int/index.html
[240] Kyoto Protocol, 1997, Article 6.1.
[241] Jacob Werksman, "The Clean Development Mechanism: Unwrapping the Kyoto Surprise", *Review of European Community & International Law*, Vol. 7, No: 2, 147-15, 1998; p. 226

achieve substantial participation of developing countries in the Protocol and earn emission credits from project based activities in developing countries.

Through CDM, Annex I Parties implement project activities that reduce emissions in non-Annex I Parties, in return for certified emission reductions (CERs). The CERs that are generated by such project activities help to Annex I Parties to meet their emissions targets under the Kyoto Protocol. The COP/MOP is recognized as the highest CDM authority and undefined "executive board" to supervise the mechanism.[242]

In the Article 12 of the Protocol, CDM is defined to assist developing countries "in achieving sustainable development and in contributing to the ultimate objective of the Convention". Unlike to JI and Emission Trading, CERs of CDM are added to the assigned amount of the acquiring Party but not to be subtracted from the assigned amount of another Party.[243] This is due to the fact that developing countries are not subject to quantified targets under the Kyoto Protocol.

Through CDM, the developing countries may attract investments from the public and private sectors in climate-friendly technologies so they contribute to the global combat on climate change. Participation in the CDM is based on voluntary approach in which only if it is above and beyond business-as-usual, and contribute to sustainable development as defined by the host country.

5.3.3.3. The Emissions Trading

Through the emission trading, "unused" GHG emissions are traded from countries staying below their targeted emissions, to countries that do not meet their obligations and thus exceed their allowed emission levels in a particular commitment period. In this case, limits or "caps" are put so that a commodity is created. According to the Protocol, caps are provided by the binding limitation and reduction obligation. Any country that stays below the limit can offer the difference for sale. The assigned amount that is transferred is subtracted from the allowed emissions of the seller-country and added to that of the buyer-country.[244]

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[242] UNFCCC Clean Development Mechanism (CDM) http://cdm.unfccc.int/index.html
[243] Kyoto Protocol, 1997, Article 12.3
[244] Sebastian Oberthür and Hermann Ott, *"The Kyoto Protocol: International Climate Policy for the 21st Century"*, Springer, Heidelberg, 1999, p.187.

Emissions trading system sets an emissions market, in which the costs of different countries to comply with the quantified targets are different. Consequently, overall cost of achieving an emission reduction target is minimized, while emission reductions that can be realized from limited resources are maximized. In this respect, emission trading is an instrument to reach efficient cost in emission reduction.

According to Article 17, Annex B Parties to Kyoto Protocol can participate in a trading regime. Parties without legally binding emission reduction and limitation objectives under the Kyoto Protocol are not allowed to participate in trading. Therefore, the developing and industrialized countries that do not ratify the Kyoto Protocol or not included in Annex B can not benefit from Emission Trading. [245]

5.4. The Post-2012 Global Climate Regime

The world already experience climate change and it seems that climate will continue to change despite the mitigation efforts under in the UNFCCC and Kyoto Protocol. The first commitment period of the Kyoto Protocol is from 2008 to 2012, therefore there is need for a new broad international agreement on climate change in after 2012. For this purpose, the negotiations continue and they are expected to hold a political decision on new climate regime during the 15th Conference of the Parties to the UN Framework Convention on Climate Change (COP 15), which will be held in December 2009 in Copenhagen. The political decision, that is expected to be taken in Copenhagen, will be open to signature of the parties. Hence, the new agreement on post-2012 climate regime is to be decided to come into effect in the following years. The frame, content, measures and targets of the new climate regime are under the discussion of the parties.

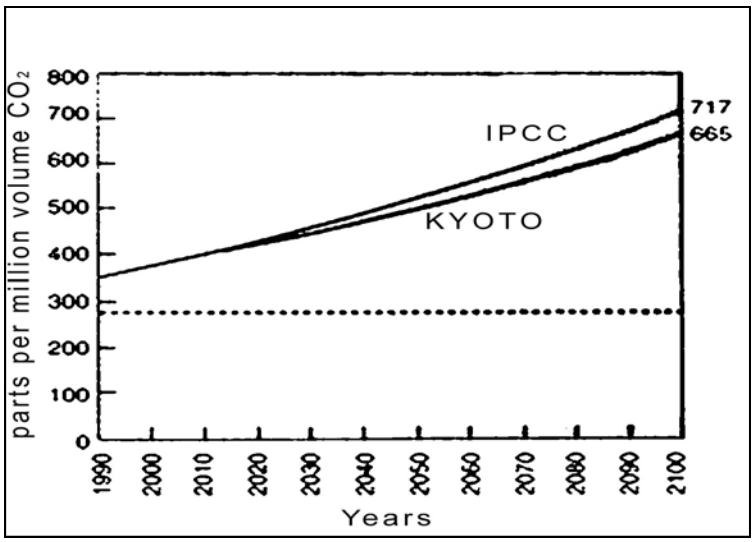
Establishment of a consensus between the main actors, particularly, the EU, US, China, Russia, India, Japan and Canada, is vital for the success of the post-2012 climate regime. While the EU has a leading role at the Kyoto and post Kyoto process, withdrawal of the US from the Protocol damaged the balance of power within the system and overall international cooperation. Moreover, the US's stance postponed the entry into force of the Kyoto Protocol.

[245] UNFCCC, *"Uniting on Climate: a Guide to the Climate Change Convention and the Kyoto Protocol", op.cit.* p.31.

Hence besides the other actors, participation of the US into the post 2012 negotiations is indispensable in order to prevent similar obstacles and problems.

The Kyoto Protocol is criticizes for having a limited influence in reducing GHG emissions worldwide. Average 5% reduction[246] target was heavily criticized, since it was considered relatively low as compared to the principle[247] set by the UNFCCC without advantages of land use changes. Figure 5.2 shows the projected effect of Kyoto Protocol in 100 years in terms of CO2 emissions as compared to pre-industrial concentration, if it could be applied with full compliance.

Figure 5.2 Kyoto Protocol Target Projection Comparisons



Source: http://www.gcrio.org

Hence, the new agreement is expected to set more ambitious targets mainly for the developed while encouraging efforts of developing countries to reduce their GHG emissions. Nevertheless, the GHG mitigation commitments in post-2012 regime should not constrain adaptation and sustainable development in the world. Credible global compact for climate change is desired to be comprehensive, equitable, realistic, efficient and effective.

[246] Reductions of the Kyoto protocol count land use changes (i.e. forest plantations) as actual reductions in the GHG concentrations.
[247] In 1992, UNFCCC initially aimed in principle at stabilizing the GHG emissions at 1990 levels by year 2000 without binding rules. As the target was non-binding, no country complied with it.

5.4.1. Climate Negotiations of Post-2012

In December 2009 in Copenhagen, 191 countries plus the European Community as Parties to the UNFCCC aim to reach an agreement on global action to combat climate change in post 2012. The negotiations have been initiated in 2005 in Montreal, Canada, where COP 11/MOP1, first session of the governing body of the Kyoto Protocol (MOP), was held. This meeting provided a momentous platform for discussion of the future international negotiations on climate change. The Montreal Conference focused on the one hand emissions mitigation, and on the other hand on adaptation to climate change impacts. COP11 has been very important for the future negotiations and implementation of the climate change regime in the post-2012.[248]

In COP11/MOP1, parties started to explore options for future cooperation in a way reflecting the full range of interests of the Convention. Consequently, it is decided to establish a new subsidiary body for discussing post-2012 commitments, namely the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP). Moreover, it has also been decided to consider long-term cooperation under the UNFCCC through a series of four workshops constituting a Dialogue about the issue until COP13. The four topics to be studied under the Dialogue are; 1) advancing development goals in a sustainable way, 2) addressing action on adaptation, 3) realizing the full potential of technology and 4) realizing the full potential of market-based opportunities.[249]

Following the Montreal Negotiations, United Nations Ministerial Conference COP12/MOP2 took place in 2006 in Nairobi, Kenya, where issues related to the Protocol's flexibility mechanisms, compliance and capacity building have been discussed. In the meeting parties focused on clean technology implementations for Sub-Africa and other poor regions as well as future global actions on climate change and the plans for post-2012. During COP12, there were three meetings; namely the 12th Conference of the Parties (COP 12), the 25th SBI and SBSTA; and the 2nd Workshop on Long-Term Cooperation. MOP2 was consisted of two meetings, namely 2nd Meeting of the Parties and Meeting of a Workshop.[250] Business and

[248] UNFCCC, *"Uniting on Climate: a Guide to the Climate Change Convention and the Kyoto Protocol"op.cit,* p.37.
[249] UNFCCC, Vienna Climate Change Talks 2007 – AWG4 and the Dialogue 4 – Issue: 4. Vol.12, No.337. 30 August, 2007
[250] Ad Hoc Working group (AWG) according to Article 3.9 of the Kyoto Protocol

economics dominated to COP12, especially, the report of Sir Nicholas Stern attracted attention to the economic consequences of climate change. The report indicated that the impacts of climate change are forecasted to be far more costly to the global economy compared to the present steps needed to be taken to control them. Hence, countries are urged to take real actions rather than political rhetoric.

At the 13th Conference of the Parties to the Convention (COP 13) in December 2007, in Bali, Indonesia, it was decided to launch a negotiating process "to enable the full, effective and sustained implementation of the Convention". In COP13 parties adopted the Bali Action Plan, so called "roadmap", which is the agenda for the negotiations that outlines the negotiation framework towards the adoption of a new global post-2012 climate treaty at the end of the year 2009. Negotiations include mitigation, adaptation, technology, and financing. Although there is a general agreement about these building blocks, there are very different opinions on the t content of them. The Bali Action Plan outlined the key elements of the negotiation process leading up to COP 15 in December 2009 in Copenhagen:[251]

1. A shared vision for long-term cooperative action
2. Enhanced national/international action on climate change mitigation
3. Enhanced action on adaptation
4. Enhanced action on technology development and transfer
5. Enhanced action on the provision of financial resources and investment.

In the framework of negotiations under the UNFCCC and the Kyoto Protocol processes, two major discussion tracks are established in Bali. The first track is Ad-hoc Working Group on Further Commitments for Annex I Parties (AWG-KP) and the second one is Ad-hoc Working Group on Long-term Cooperative Action (AWG-LCA).

Ad-hoc Working Group on Further Commitments for Annex I Parties (AWG-KP), which is composed of parties that have ratified the Kyoto Protocol, considers commitments for the post-2012 period for Annex I Parties under the Protocol. Parties aim to minimize and even annihilate the gap between the first and second commitment periods. The AWG discusses and examines the costs and benefits of current and future policies, measures and technologies, as

[251] See UNFCCC web site http://unfccc.int/meetings/cop_13/items/4049.php

well as mitigation potential, effectiveness and efficiency. On the other hand, the Ad-hoc Working Group on Long-term Cooperative Action (AWG-LCA) aims to launch a comprehensive process to address climate change by enhancing the full, effective and sustained implementation of the Convention. The Dialogue resulted in exploratory thematic workshops, including sustainable development, adaptation, technology potential and market-based opportunities, which are considered as possible building blocks for a post-2012 climate agreement. It is supposed to complete its work by the COP 15 in Copenhagen in December 2009, where parties are expected to agree on the main features of the post 2012 climate change regime, both under the KP and the UNFCCC.[252] Moreover, in Bali, developing countries agreed to seek ways to make "measurable, reportable and verifiable" (MVR) emissions cuts through implementing Nationally Appropriate Mitigation Actions (NAMAs).

The COP 14, which was held in December 2008 in Poznan, assessed the progress made on the Bali Road Map and provided additional political guidance for the post-Kyoto 2012 negotiations. In this respect, the UNFCCC Adaptation Fund and the Poznan Programme on Technology Transfer were launched. Moreover, in Poznan parties have established a negotiation programme to lead to a final agreement in December 2009 at COP 15 in Copenhagen.[253] The ongoing negotiations are expected to lead in Copenhagen a global consensus and political decision, which will require legislative follow-up and new climate protocol.

5.4.2. The Main Discussions in Post-2012: Burden-sharing among the Developed and Developing Countries

The main discussion issues of the Post-2012 Climate Regime are historical responsibilities for the current stock of GHG emissions and implications for funding adaptation and mitigation programs. Scientific uncertainties concerning the impacts and timing of climate change hinder discussions on burden sharing. One of the main debates is on the distribution of burdens and responsibilities among countries according to their capabilities and historical responsibilities for anthropogenic climate change. The developing countries argue that developed countries should bear the burden, while the developed countries expect considerable contribution of

[252] Gunnar Still, Noriko Fujiwara and Christian Egenhofer, "*Making The Most of the G8+5 Climate Change Process Accelerating Structural Change and Technology Diffusion on a Global Scale", op.cit.* p.22.
[253] See UNFCCC web site http://unfccc.int/meetings/cop_14/items/4481.php

developing countries to international adaptation financing, since an increasing share of the population is becoming part of the global consumer class.

Developing countries accuse the developed countries by not having serious and considerable commitments so far. In this respect, they claim that the new climate regime should attribute more responsibility to developed countries taking into consideration their historical responsibility. On the other hand, developed countries argue that challenge of global climate change cannot be addressed within the current frame of the UNFCCC and Kyoto Protocol, so they call for more concrete and comprehensive actions also from developing countries under the new agreement. Moreover, developing countries are criticized by being only interested in incentives without associated mitigation responsibilities.

Due to the rapid economic growth and large populations, emissions are increasing constantly in developing world despite to their low share on per capita basis. The low and middle-income countries, including China and India, are expected soon to account for about a half of global CO2 emissions.[254] Therefore, in order to tackle the global climate problem, developed countries ask them to substantially reduce their emissions, even if they have less historical responsibility. Nevertheless, developing world's citizens are not willing to pay for emission reduction, until they get rich and catch the developed countries welfare levels. Therefore, these countries are encouraged at least to lower their CO2 emissions substantially below their business-as-usual path.

There is a need for urgent action for adaptation of developing countries, particularly the most vulnerable countries, namely the Least Developed Countries, Small Island Developing States and countries in Africa, which are prone to weather-related disasters such as droughts and flooding. Adaptation requires technology, investment and financing. According to the principle of common but differentiated responsibilities, developing countries claim that developed countries should bear a large share of the investments for the adaptation of developing countries. The developed countries are reluctant to make commitments on massive transfer of resources to developing countries for managing climate change while the latter are unwilling to make any commitments on emissions without such resource transfers.

[254] IEA, International Energy Agency, "*World Energy Outlook 2008"*, Paris, 2008.

In 2008 the G8 Declaration[255] calls for adoption of the goal for achieving at least 50% reduction of global emissions by 2050 while emphasizing the need for "contributions from all major economies", in order to include major economies such as China an India in the new climate regime. G8 declaration affirms "all major economies will need to commit to meaningful mitigation actions in the international agreement to be negotiated by the end of 2009". Indeed countries still refrain from any commitments to numerical targets and action plans.

The issue of technology is another crucial point in a future climate agreement. During the last decades technology has been discussed in relation to technology transfer under the Convention. However, there is a focus on the need for a large-scale shift towards clean and low-carbon technologies through research, development and large scale deployment.

China declared that it is neither prepared to accept absolute targets nor to participate in international emission trading regime. Nevertheless, China has some efforts to control the rapidly growing greenhouse gas emissions. For instance, China has set specific targets for cutting energy intensity of GDP by 20% from 2005 levels and freezing industrial emissions of nitrous oxide at the 2005 level. In order to achieve this, China calls for technology transfer and financial assistance. On the other hand, India declares that reductions can be accepted only after per capita emissions grow to average OECD levels.[256]

As the main driver of Kyoto regime, the EU claims that, for a realistic action, concerning the national circumstances, developed countries should have about 30% collective reduction by 2020. Moreover, the EU claims that "advanced developing countries" should have commitments to set their own binding emission targets and should limit the rise of GHG emissions in 2020 by 15% to 30% below "business as usual" projections. The EU claims that the collective emissions reduction by developed countries must be shared out fairly in a way that ensures each country to make a comparable effort. Therefore, the EU asks the distribution of the overall targets on the basis of responsibility of each country for emissions and its capability to reduce them.[257]

[255] G8 Summit (2008), http://www.g8.utoronto.ca/summit/2008hokkaido/2008-climate.html
[256] Environmental and Energy Study Institute http://www.eesi.org/CCN_11.23.07
[257] European Commission, *"EU Action Against Climate Change Leading Global Action to 2020 and Beyond", op.cit.* p.23.

In order to assess comparability, the EU suggests a balanced combination of criteria such as:[258]

- Capacity to pay for domestic emission reductions and purchase reduction credits from developing countries: This suggests that nations, which have high per capita income levels, should contribute more to reducing emissions at home and in other countries.
- Potential for cutting greenhouse gas emissions: accordingly, since countries with less efficient economies usually have more scope for reducing GHG output at lower cost, they should contribute more to overall cuts.
- Domestic early action to reduce GHG emissions: This criteria asks rewards for the past reduction efforts when assessing the size of cuts on current levels.
- Population trends and total GHG emissions: In view of that countries with growing populations should be asked for smaller cuts than those with stable or declining populations.

Under the climate negotiations, cooperative sectoral approaches are also discussed as one of the tools. Cooperative sectoral approaches aim to enable developed and developing countries to collaborate on sector specific mitigation and adaptation activities. This can enhance actions and increase financial flows to developing countries. There have been proposals for several types of sectoral approaches.

5.4.3. Success of Post-2012 Climate Change Regime

The world leaders are expected to come to an agreement initially on the size and the timeframe of reductions in current discussions leading up to an international agreement at the COP 15 in Copenhagen in December 2009. Upon this overall political agreement the technical and financial mechanisms and details are to be followed by legal protocol.

The emission reduction targets of the Copenhagen deal should be large enough to stabilize GHG concentrations at a level that would "prevent dangerous anthropogenic interference with the climate system".[259] In order to avoid this interference, it is scientifically accepted that global mean temperature increase should be stabilized around 2°C, which requires stabilizing

[258] *Ibid.*p.19-21.
[259] OECD, *"The Economics of Climate Change Mitigation: How to Build the Necessary Global Action in a Cost-Effective Manner?",op.cit.,*pp.16-20.

overall GHG concentration in the atmosphere at no more than about 450-550 ppm. Scientific reports indicate that global GHG emissions must be reduced to less than 50% from 1990 levels by 2050, in order to achieve staying below the 2°C threshold. On the other hand, the IPCC indicates that this would require emission reductions for developed countries in the range of 25-40% by 2020 and 80-95% by 2050.[260] For a concrete, coherent and comprehensive approach, all developed countries should commit to binding emission reduction targets since they have financial and technological capacity for quantitative reductions. Hence, developed countries should lead the process and encourage the developing countries to be part of it while demonstrating that a low-carbon economy is possible and affordable. On the other hand, it is important to ensure contribution from developing countries, particularly advanced developing countries, most of which are constantly becoming important emitters. Consequently, global cooperation is essential to for the success of the post-2012 climate regime and providing the necessary capacity, technology and finance for this end.[261]

All countries are ought to agree on quantified emission reductions targets in a timetable, in which developed and developing countries have commitments according to their national circumstances. Indeed, differentiation among countries will be necessary, rather than one overall approach, which is applicable for all countries. While involving the non-Annex I countries, the emerging economies, the least developed countries in the process, differences between them should be taken into account.

Management of GHG emissions should be based on science, research on the impacts of climate change, and the social, environmental and economic drivers of national and regional priorities. This approach can provide a comprehensive and objective framework in order to have sustainable and effective international agreement. The new climate framework should recognize and take into account the national and regional social, environmental and economic circumstances.

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[260] IPCC, *"Climate Change 2007: Synthesis Report Summary for Policymakers, Inter-governmental Panel on Climate Change" , op.cit.*

[261] EC, Commission of the European Communities, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *"Towards a Comprehensive Climate Change Agreement in Copenhagen",* COM/2009/0039, Brussels, p.3.

Post 2012 climate regime needs to have a global long-term goal, which does not contain distant aspirations, but promotes intermediate targets for the developed countries. There should be shared vision for long-term cooperative action to combat climate change in the long-run. It is essential to promote all countries to sign up to long-term cooperative action consistent with science, and a continuous political process to review progress towards objectives and to modify objectives as needed. In order to promote involvement of all parties, the Copenhagen deal should provide effective institutional arrangements, which are transparent, inclusive, efficient and effective. Hence there is a need for equitable governance structure, which respect balanced representation and take into consideration the priorities of developing countries.

In order to tackle global climate change, apart from the developed countries, developing ones should cut their GHG emissions far below their business-as-usual (BAU) path. According to IPCC, in order to meet the 2°C objective, developing countries should limit the rise of GHG emissions through nationally appropriate actions to 15-30% below 1990 by 2020. However, especially under heavy economic crisis, climate change may not be top priority issue in the domestic political sphere in developing countries, so neither their citizens nor the governments are willing to get burdens to cut emissions very much.

The overall mental transformation and change of life style are essential for the transformation to the low-carbon economy. The western style consumption patterns have caused serious environmental problems that threaten the well being of people and the ecosystems. In line with economic and industrial development, developing countries tend to adopt this kind of consumption patterns. Nevertheless, it is widely acknowledged that the ecosystem will not be able to carry anymore such a growing stress overloaded with growing world population and increasing environmental degradation. Nonetheless, the emerging middle class in developing countries, which replicate the western lifestyle is unlikely to accept departure from the current western lifestyle only if the west itself changes its lifestyle to a more sustainable pattern.[262] It is not fair to ask the developing countries to drive less car, consume less energy, unless the production and consumption patterns in the developed world are changed substantially. Hence, the post-2012 climate agreement cannot realistically demand emissions quotas from

[262] Agarwala, Ramgopal, "Towards a Global Compact for Managing Climate Change", *The Harvard Project on International Climate Agreements Discussion Paper*, 22 August 2008.
Available at: http://ec.europa.eu/public_opinion/archives/ebs/ebs_295_en.pdf

developing countries that are below BAU, unless the developed nations make credible efforts. Hence, all countries should consider new measures to promote the mental and life style transformation in accordance with the transition to the low-carbon economy in cost-effective and sustainable manner.[263]

The challenge is how to encourage people and companies to replace existing assets by low-carbon technologies and to promote investing in low-carbon technologies. Taking into consideration the scientific warnings about severity of global warming, all countries must work collectively towards a low-carbon economy. For this purpose, developed countries should take and implement GHG emission reduction targets while developing countries slow emissions growth, enhance carbon sequestration and set strategies for net emissions reductions over the long term.[264]

Setting ambitious reduction targets should be strengthened by well defined measures and enforcement mechanisms. In this respect, there is a need for establishment of monitoring, reporting and verification regime consisting of all major economic sectors on an annual basis. In this framework, rather than expression of good will, the new agreement should include enforceable and strong sanction mechanism in case of non-compliance with reduction commitments in order to deter the failure of countries.

Post-2012 climate regime should give equal weight to adaptation and mitigation since developing countries are looking for a package of deal comprising mitigation, adaptation, technology and financing rather than only mitigation targets. In order to foster adaptation, post-2012 climate regime should reflect on equity and justice while facilitating synergies between "top-down" supports and "bottom-up" engagement approaches. Meanwhile, research capacity should be enhanced to assess local impacts and prioritize adaptation measures. On the other hand, regional cooperation should be supported in trans-boundary issues such as river basin management.

[263] Somanathan, E., *"What Do We Expect from an International Climate Agreement? A Perspective from a Low-income Country",* Discussion Paper No. 27, Cambridge, Mass.: Harvard Project on International Climate Agreements, December 2008, pp.5-6.
[264] WBCSD, "*Towards a Low-carbon Economy", op.cit.* p.3.

As agreed under the UNFCCC, countries are expected to act in line with the principle of common but differentiated climate protection responsibilities and principle of action based respective capabilities. Since developing countries have different national circumstances and stages of development, there is a need for differentiated actions and levels of ambition and targets. This can be achieved through national climate change strategies and mitigation strategies in the context of development. Some developing countries, such as China, India, South Africa, and Brazil, have already declared their national climate change strategies.

In order to encourage actions of developing countries, the new climate regime should provide mechanisms, including 1) direct funding for low-carbon technology development and adaptation projects, 2) mechanisms to facilitate the deployment of clean technology; infrastructure to facilitate the development of a global GHG market; 3) measurement, reporting and verification (MRV), 4) framework to support sector-specific actions. In this respect, promotion of Intellectual Property Rights (IPRs) encourage available energy efficient and climate friendly technologies to avoid a carbon intensive and business-as-usual developing country growth trajectory that repeats the development paths of industrialized countries.[265]

Technology and its transfer are crucial for the success of global agreement. Existing low-carbon technologies have the potential to significantly reduce global emissions. However, enabling their rapid deployment in both developed and developing countries should be encouraged in the new agreement through specific measures and policy responses. Improvements in technology can foster the transformation to climate-resilient, low-emissions in the future. Technology dissemination and deployment should be promoted while protecting intellectual property rights. The new climate deal should contain new mechanisms to ensure suitable technologies for mitigation and adaptation, particularly for the service of developing countries. In order to support the deployment of new technologies, a future framework should facilitate the scale-up of research, development and demonstration of the clean energy technologies through new financial mechanisms and international cooperation.[266]

Another key issue of the post-2012 climate regime is the funding issue. The developed countries are unwilling to make commitments on massive transfer of resources to developing

[265] *Ibid.* p.3.
[266] *Ibid,* p.5.

countries while the latter are unwilling to make any reduction commitments without such resource transfers. Hence, there is an urgent need for innovative ideas for financing, especially under severe conditions of the economic crisis.

The new climate regime should ensure that climate change goals are delivered cost-effectively. In this respect, industry is very much concerned with the protection of sound international competition on a global level in the new climate regime. In this framework, more active involvement of the private sector is essential issue for the new climate deal, so it should provide basis for the large-scale private and public investment through enhancing carbon markets and public funding to leverage private finance. In addition, global cost-effective mitigation actions should be encouraged by providing tools enabling carbon markets to link as they develop at regional and national levels.

Over the longer term, economically efficient low-carbon growth can be promoted by providing strong and stable carbon price, which is eventually reflected in the price of the final product. Through carbon price, the business is encouraged to take the least costly actions. Nevertheless, these efforts in developed countries can not spread global commodities, unless a universal price on carbon is achieved. A uniform global carbon price helps to guarantee generation of emissions where they yield the largest social net benefits. Moreover, this provides flexibility in reducing GHG emissions at the minimum cost.[267] Nevertheless, development and organization of future carbon markets is challenged by the uncertainty about commitments of countries in the post-2012 climate regime.

It is possible to enhance the financial flows to developing countries through addressing investment barriers, extending and streamlining the Clean Development Mechanism (CDM) while establishing new mechanisms to attract large scale investments. Hence, in the new agreement, the current flexible mechanisms should be enhanced and renewed. Through the Joint Implementation (JI) under the Kyoto Protocol, developed countries may invest in emission-saving projects in other industrialized countries and use the emission credits generated by the projects to help meeting their own emission targets. In the new climate regime, the effectiveness and efficiency of JI should be improved by guaranteeing its environmental integrity while opening it to new participants.

[267] Ottmar Edenhofer and Nicholas Stern, *"Towards a Global Green Recovery Recommendations for Immediate G20 Action.", op.cit*. p. 39.

The CDM facilitates developing countries to participate in the international carbon market and generate considerable flows of capital and technology to promote low-carbon growth in these countries. Under the new climate agreement, the CDM should also be reformed through strengthening the environmental integrity of the CDM by ensuring generation of credits only by the projects, which go beyond the lowest-cost options and deliver emission reductions that are genuinely additional to 'business as usual'.[268] In addition, it is essential to broaden the CDM to participation of developing countries, particularly the least developed countries, while improving the governance mechanism.

Adaptation to the climate change is a complex issue including many elements, such as information, knowledge, capacity, financing, and institutions. The future climate regime should offer comprehensive framework involving all these elements while on the other hand, ensuring establishment of strong integrated infrastructure planning and policy environments in order to promote adaptive capacity and resilience planning. The most important work on adaptation is undertaken at the national level, which requires knowledge and resources to implement adaptation action. In this respect, many countries will need to work on capacity building and transfer of resources, since adaptation includes many sector specific elements. All countries, including industrialized, emerging and developing countries, should establish their national adaptation strategies, while increasing the resources for the existing Adaptation Fund.

Countries mainly face a challenge of initiation and mobilization of required investment to ensure energy access and security. Successful investment and innovation would be stimulated by good governance, strong institutions and integrated policies in the frame of competitive and open market. Since diversification of energy resources is indispensable for the energy security, much attention has been attributed to renewable energy options, such as biofuels. However, current sources and technology are not sufficient for development of biofuels. Therefore, there will not be a sudden and immediate changeover from the existing fossil fuel based system to a new one.[269] Moreover, in the new regime, avoided deforestation should be

[268] European Commission, "*EU Action Against Climate Change Leading Global Action to 2020 and Beyond", op.cit*. p. 26.
[269] Durmus Kaya, "Renewable Energy Policies in Turkey", *Renewable and Sustainable Energy Reviews*, Number 10: 2006, pp. 152-163.

incorporated to future financial mechanism, while bringing global solutions for controlling emissions from aviation and shipping.

In Copenhagen the agreement on the technical issues concerning the targets, measures and mechanisms depend on the common global political will on combat against climate change. Hence, this issue is highly politicized returning in the power struggle among the "strong" states. The EU has been the most rigorous and ambitious actor to push furthers the combat against climate change, while the US has been ignorant for many decades. Without significant contribution of the US, only the EU efforts can not be successful in addressing climate change. Hence, the EU tries to push the US to support the post-2012 climate regime, despite the fact that the US rejected to be a party to the Kyoto Protocol. Nevertheless, the current US Government of Obama is more willing to support the global combat against climate change, comparing to the previous US Presidents. In this respect, in June 2009 the U.S. House of Representatives passed the American Clean Energy and Security Act, namely ACES Act, which aims to establish an economy-wide, GHG cap-and-trade system and maintains critical complementary measures to help addressing climate change and building a clean energy economy as well as reducing US carbon emissions by 17 %by 2020, from 2005 levels.[270] The global community is looking forward the US Senate to pass this legislation before the Copenhagen Climate Summit of December 2009.

Some experts claim that the global negotiations on climate will not succeed to reach a global climate agreement before the US Energy and Climate Policy is adopted. The position of the US is essential not only for the EU, as the main driver of climate regime, but also for China and India, as large emitters and developing countries.[271] If the US does not present a promising emission reduction and adaptation measures before the Copenhagen, than it will be much difficult for the EU to persuade China, India, Russia and other large emitters to take action. Whatever decision is taken in Copenhagen, action-based approaches are essential in achieving the emission reduction and in putting into place the infrastructure, technologies and experience that will help to stimulate the further decarbonisation of development in the post-2012 period.[272]

[270] http://www.whitehouse.gov/issues/energy_and_environment/
[271] http://www.reuters.com/article/latestCrisis/idUSN31451301
[272] Gunnar Still, Noriko Fujiwara and Christian Egenhofer, "*Making The Most of the G8+5 Climate Change Process Accelerating Structural Change and Technology Diffusion on a Global Scale",op.cit.*, p.2.

Consequently, as the UN Secretary-General Ban Ki-moon stated, the Copenhagen deal should be comprehensive and ensure 1) enhanced action to assist the most vulnerable and the poorest to adapt to the impacts of climate change; 2) ambitious emission reduction targets for industrialized countries; 3) nationally-appropriate mitigation actions by developing countries with the necessary support; 4) significantly scaled-up financial and technological resources; and an equitable governance structure.[273]

[273] Statement of UN Secretary-General Ban Ki-moon on Climate Change Summit at UN, 22.09.2009. Available at: http://www0.un.org/apps/news/infocus/sgspeeches/statments_full.asp?statID=586

VI. SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE POLICIES IN THE EUROPEAN UNION

6.1. Evolution of European Environment and Climate Policy in the Way to Sustainability

Besides the United Nations, European Union (EU) is another supranational body that have significant role in international environmental protection while enforcing policies of sustainable development and climate change. As a global environmental actor, the EU deals with the global issues, including sustainable development, mitigation and adaptation to climate change. In this framework, the EU presents itself as the "promoter of universal values on a global scale."[274]

The EU has an essential role to bridge domestic and international dimensions of environmental policy. On the one hand, the EU establishes its own common environmental policy while taking into consideration social, economic, political and ecological differences of the Member States. On the other hand, the EU has been one of the most enthusiastic parties to various international environmental agreements, particularly in the issue of climate change. In this respect, the EU has unique supranational responsibilities, which are inherited from the European Community to the European Union. Regarding the environmental policy, the EC has shared competence so that the EU institutions do not act separately from the Member States. Therefore, it plays a bridging role between its member states and broader international community.[275]

The Kyoto Protocol provides an essential ground for the EU policies to reduce greenhouse gas emissions and to combat climate change as a global actor. Indeed, the EU gained a new ground in the post-2012 negotiations process by promoting mitigation of the climate change and adaptation strategies in the second commitment period starting from 2012. Through the Kyoto and post-Kyoto processes, the EU aims to achieve sustainability of environmental protection by combating climate change.

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[274] Sibylle Scheipers and Sicurelli, Danieala, "Normative Power Europe: A Credible Utopia?", *Journal of Common Market Studies,* Volume 45, Number 2, 2007, pp: 435-457.

[275] Ludwig Kramer, "The Roots of Divergence: A European Perspective", in N. Vig and M. G. Faure (eds), *Green Giants? Environmental Policies of the United States and the European Union,* Massachusetts Institute of Technology, 2004, pp: 53-73.

Sustainable development has been one of the most important and promising norms of the EU, which is considered as a normative international power, due to its ability to diffuse its norms on the world stage.[276] Through Partnership and Cooperation Agreements as well as development –cooperation and trade policies, the EU promotes environmental norms to third countries in its close neighborhood. Nevertheless, despite all the actions and policies, the EU, has still a long way to sustainability. Thus, the EU needs to reduce further its footprint while investing more on energy efficiency and technological innovations for transforming to carbon economy as well as promoting sustainable consumption and production models within and outside its boundaries.

6.1.1. The Early Actions in the ECC

The EU, which has been evolved from the European Coal and Steel Community, has been legislating in the area of environment policy for many decades. Constituting the most popular policy subject of the contemporary politics, environmental protection, sustainable development and adaptation to climate change were not initially one of the objectives of the European integration. Indeed, the EU's environmental policy has evolved in an ad hoc pattern and currently sustainable development and climate change represent one of the most important and promising components of almost all European policies, whether in rhetoric or in practice. In this respect, the EU plays a leading role in sustainable development and global environmental issues, particularly in climate change.

The European Market Project provided the legal basis for environmental protection and common environmental standards. Hence the evolution of European integration and environmental governance can be considered as intertwined processes. In 1957, the Treaty of Rome did not have a direct reference to environmental issues. Until the signature of the Single European Act in 1987, all environmental implementations were based on only articles 100 and 235 of the Treaty of Rome.[277]

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[276] Simon Lightfoot and John Burchell, "The European Union and the World Summit on Sustainable Development: Normative Power Europe in Action", *Journal of Common Market Studies,* Vol. 43, Number 1, March 2005, pp: 75-95.

[277] Article 100 of the Treaty of Rome states " Without prejudice to any other procedures provided for in this Treaty, the Council, acting by a qualified majority on a proposal from the Commission, may decide upon the measures appropriate to the economic situation, in particular if severe difficulties arise in the supply of certain products. Where a Member State is in difficulties or is seriously threatened with severe difficulties caused by natural disasters or exceptional occurrences beyond its control, the Council, acting by a qualified majority on a proposal from the Commission, may grant, under certain conditions, Community financial assistance to the

The issue of natural limits to growth and environmental concerns in relation to social and economic concerns started to occupy the international community mainly under the leadership of the UN by the early 1970s. These global developments and considerations have been also reflected gradually at the European level. Due to rapid growth and reconstruction of the European economies during the Post-World War II period of the 1950s and 60s, the Member States started to face environmental problems originating from air, water and soil pollution. Against these problems, some Member States, mainly the most developed states, started to take national measures, which led to some kinds of environmental protectionism, including administrative regulations and economic instruments. The more developed and environmentally aware and sensitive Member States, such as Germany and the Netherlands, have been the pioneers in this issue.

The differences of national environmental regulations and measures would deteriorate trade, market integrity and competitiveness while distorting accomplishment of the single market. Therefore, the member states decided to harmonize diverse national environmental policies by taking concentrated Community action in environment and sustainable development issues. Hence, the early stages of the EU environmental policy did not urge only from environmental, but also economic considerations. In this respect, the needs to engage with the market and spread of neo-liberal ideas have promoted the common environmental policy of the EU.[278]

Moreover, the transboundary character of pollution problems required Community level environmental policies, since environmental problems originating from one state affect several others. European wide environmental policy constitutes more coherent approach and system for the EU level environmental protection crossing national borders. In 1970s, the EC has started to draw attention to transboundary global environmental threats and it became party to several international conventions.[279]

Member State concerned. The President of the Council shall inform the European Parliament of the decision taken (See Official Journal, C 321E of, 29 December 2006)." Article 235 of the Treaty of Rome states "The Court of Justice shall have jurisdiction in disputes relating to compensation for damage provided for in the second paragraph of Article 288 (See Official Journal, C 321E of, 29 December 2006)." Second Paragraph of Article 288 states "In the case of non-contractual liability, the Community shall, in accordance with the general principles common to the laws of the Member States, make good any damage caused by its institutions or by its servants in the performance of their duties" (See Official Journal, C 321E of, 29 December 2006).

[278] Albert Weale, "*Environmental Governance in Europe: An Ever Closer Ecological Union*?", Oxford University Press, Oxford, 2002, pp.29-32.

[279] Pamela Barnes and Ian Barnes, "*Environmental Policy in the European Union*", Edward Elgar, Cheltenham, 1999, p.9

Following the UN Conference on Human Environment in Stockholm in 1972, the international community met in Paris Summit of EC Heads of the State and Government, which has resulted in the EC's First Environmental Action Programme (EAP) (1973-1976). By activating a process of change, which would formalize and institutionalize environmental policy at supranational level, the Paris Summit is considered as the turning point for the EC's environmental policy.[280] The First European Environmental Action Programme (EAP) declared that economic growth was not "an end in itself".[281] Being established on the argument that economic development, prosperity and protection of environment are mutually interdependent, the 1st EAP provided a ground for environmental regulations and standards in the European legal system. The main objectives of the 1st EAP were prevention of environmental damage and pollution, conservation of an ecological equilibrium, and rational use of ecological resources. The 1st EAP proposed three kinds of actions including, minimizing and preventing pollution, improving current European environment, and pursuing EC policy objectives at other international levels. It also established environmental principles, such as preventive action, responsibility of the polluter for environmental damage and its rectification and the need action at most appropriate level.[282]

The EC launched the 2nd EAP (1977-81), which was principally a restatement of objectives of the First EAP. However, in line with the increasing environmental problems, nature protection has been attributed special attention in the 2nd EAP. During the First and the Second EAPs, several directives were introduced for air, water, and waste management. For instance, the former Directorate General (DG) XI, now the DG for Environment, was established in 1981 as the main institution of the EEC responsible for the environmental policy.

While during the 1970s, environmental problems were treated in isolation, mainly focusing on repairing damages and preventing further pollution through regulating *end-of-pipe*[283] emissions of pollutants, in 1980s interdependency of environmental problems has been gradually recognized. Hence the EEC started to have gradually a more preventive

[280] Albert Weale, *op.cit*. p.56.
[281] Kenneth Hanf and Alf-Inge Jansen, "Environmental Policy- the Outcome of Strategic Action and Institutional Characteristics", in Hanf, K., A. Jansen (eds), *Governance and Environment in Western Europe, Politics, Policy and Administration*, Longman, Harlow, 1998, pp:1-17.
[282] European Environmental Bureau (EEB), EU Environmental Policy Handbook , 2005, p.19.
[283] The traditional measures for combating pollution are characterized as end-of-pipe technology, i.e. treatment of waste and polluting streams. Trough time, the inadequacy of this approach have been realized and measures for preventing pollution at source (from pollution abatement towards pollution prevention) gained prominence. This approach is called 'cleaner production'.

approach.[284] In this respect, the 3rd EAP (1982-1986) included commitments to reduce pollution at source, while promoting guiding principles of 'prevention rather than cure' approach, which aims prevention of pollution before it is created. Hence, there was a shift from the quality-approach towards the emission standards approach so that it was promoted to develop new filter technologies to curb pollution at source. Apart from being more preventive, the Third EAP focused on relation between internal market and environmental policies while emphasizing potential risks and benefits of environmental policy in the achievement of the internal market. In this respect, it promoted harmonization of environmental measures to avoid distortions in industry competitiveness.[285] Integration of environmental concerns into other Community sectors was achieved in the Third EAP, which highlighted the need for greater awareness of environmental dimensions in the fields of agriculture, energy, industry, tourism and transport.[286]

In order to add a new momentum to European integration, in 1987 the Single European Act (SEA) made several amendments to the Treaty of Rome. Over the years, it has been recognized that environmental issues are closely linked to several other policies including single market, agriculture, transport, energy, industry and social policies. In line with this recognition and growing concern about environmental issues among European people, the role of the Community has been increased. The environmental policy could find a ground during the introduction of Single European Market through the Single European Act in 1987 by which the Community was attributed explicit powers in environmental field for the first time. Accordingly, the Community actions in environmental matters are based on the principles of polluter pays, integration, prevention and rectification of damage at source.

As the turning point for the Community's environmental policy, the SEA incorporated an environment title, namely Title VII, into the Treaty of Rome.[287] In this framework, the SEA had important implications in environmental policy. First of all, by introduction of a new legal title, the Commission was enabled to start making legislative proposals in areas such as the

[284] Geerten Schrama and Sabine Sedlacek (eds), *"Environmental and Technology Policy in Europe: Technological Innovation and Policy Integration"*, p.8.
[285] European Environmental Bureau (EEB) EU Environmental Policy Handbook, 2005, p.19-20.
[286] Herodes, Martina, Camilla Adelle and Marc Pallemaerts, "Environmental Policy Integration and Modes of Governance: A Literature Review", *Environmental Policy Integration and Multi-level Governance (EPIGOV)* Paper 3, 2007, p.8.
[287] Single European Act, Article 25, 1987 Available at: http://europa.eu.int/eur-lex/en/treaties/selected/livre509.html

protection of natural habitats, and freedom of access to environmental information.[288] Moreover, despite the fact that environmental legislation was based on unanimity before the SEA, it extended qualified majority voting (QMV) in the Council of Ministers. In addition, the Commission would no longer be devoted only Article 100 and 235 and the DGXI. On the other hand, the SEA emphasized the importance of scientific and technical information while promoting the foundation of European Environment Agency in 1990.[289]

By the SEA the environmental policy of EC has gained a legal basis while being reinforced by declaring that "environmental protection requirements shall be a component of the Community's other policies". Within Title VII, the Article 130(r) indicates the Community objectives relating to the environment as "to preserve, protect and improve the quality of the environment, to contribute towards protecting human health, and to ensure a prudent and rational utilization of resources". Moreover, the role of DG XI's within the Commission has been enhanced by the SEA, which established that environmental protection measures must be a component of the Community's other policies. In addition, the SEA introduced the main principles of the EC environmental policy; 'polluter pays' principle, and principle of prevention.

6.1.2. More Concrete Steps in the EU

In 1992, the Treaty on the European Union (TEU), namely the Maastricht Treaty, brought further amendments to the Treaty of Rome. The Article 3 of the Maastricht Treaty requires the European Community to include environment in its policies and activities.[290] In the TEU, Member States declared their determination to promote economic and social progress for their peoples' future by Article 130r[291] that set some important objectives about environment. These objectives are: preserving, protecting and improving the quality of the environment; protecting human health; prudent and rational utilization of natural resources; promoting measures at international level to deal with regional or worldwide environmental problems. The Maastricht Treaty introduced the precautionary principle, principle of rectify at source

[288] McCormick, John, "*Environmental Policy in the European Union"*, Palgrave, New York, 2001.
[289] *ibid*
[290] The Treaty on European Union (TEU): The Maastricht Treaty, 1992, Article G(B.2)
[291] The Treaty on European Union (TEU): The Maastricht Treaty, 1992, Article, 130r.

and polluter pays principle.[292] Moreover, Treaty of the European Union declared that environmental considerations should be integrated into other community policies.[293]

The environmental principles of the EU are compatible with the idea of ecological modernization. According to 'polluter pays' principle, the full costs of environmental damage are paid by the polluter. Hence, it creates an incentive for making products less polluting and reducing consumption of polluting goods. Therefore, the 'polluter pays' principle corrects market failure, through the use of market-based policy instruments. Rather than relying on remedial action to repair damage, the 'principle of prevention' promotes improvement at the process to prevent environmental damage. It encourages development of clean technologies, minimal use of natural resources, minimal releases in the atmosphere, water and soil, maximization of the recycle of lifespan of the products. On the other hand, the prevention principle signifies a shift from regulatory command-and-control system of early environmental policy. The main routes of this principles are in line with innovatory element of ecological modernization. Policy integration implies incorporation of environmental considerations with all other policy areas. Policy integration aims to terminate separation between sectoral and environmental policies. By this way environmental concerns can become an add-on and can be perceived as a burden or restrictive, perhaps resulting in end-of-pipe solutions rather than preventive or anticipatory responses.[294] Integrating environmental considerations in sectoral policy development implies and indicates the compatibility of environmental considerations and economic development. Moreover, joint problem resolving is necessary regarding environmental and sectoral matters.

The EU committed itself to adopt and implement sustainable development in a way it was defined in the Brundtland Report. The EU's commitments are criticized by not complying with the EU policies, which have been based not upon sustainable development, but on

[292] Community policy on the environment shall aim at a high level of protection taking into account the diversity of situations in the various regions of the Community. It shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay… (TEU, 1992, 130r)

[293] "…Environmental protection requirements must be integrated into the definition and implementation of other Community policies (TEU, 1992, 130r)." 130s of Maastricht Treaty (1992) also includes some measures as provisioning primarily of a fiscal nature, measures concerning town and country planning, land use with the exception of waste management and measures of general nature and management of water resources and lastly measures significantly affecting a member state's choice between energy resources and the general structure of its energy supply (TEU, 1992, 130s).

[294] Debra Johnson, *"Ecological Modernization, Globalization and Europeanization", op.cit.* p.162.

ecological modernization strategy. The implications of sustainable development as defined in the Brundtland Report are considered in contrast with the ecological modernization strategies.

Following the Maastricht Treaty, in 1993 the White Paper on Growth, Competitiveness, and Employment, was introduced in order to reassert the importance of social solidarity in the European integration process. Moreover, the White Paper claimed the substitution of environmental taxes for taxes on labour, which aimed to enhance environmental position of the Community as well as increasing the number of jobs by lowering the tax on employment. The White Paper strengthened the commitments of the EU to sustainable development and asserted quality of life aspects of economic development. By this way, it has become a tool for revitalization of the European economy and encouraging European competitiveness especially at time that the EU was facing a crisis of legitimacy. In this framework, ecological modernization has been the leading strategy for the reassurance about the future development of the integrated European economy.[295] On the other hand, ecological modernization approach helped the EU to construct a common environmental policy among all member states while taking into account the participation issue.

The EU promotes cooperation between environmental authorities and industry while encouraging voluntary actions of the private sector to improve environmental performance. Through its treaties, environmental programs and strategies, the EU promotes integration of environmental policy into the sectoral policies. In this respect, the 5th Environmental Action Programme (1992-2002) identified five sectors, namely agriculture, energy, industry, tourism and transport. The 5th EAP also covered seven priorities including, climate change, acidification and air quality, urban environment, coastal zones, waste management, management of water resources, protection of nature and bio-diversity.[296] In this framework, it focused on implementation of the EU environmental principles through the use of a broad range of policy tools, including economic instruments and voluntary measures and policy integration. Moreover, for the first time, the 5th EAP introduced compatible, market based instruments including environmental charges, taxes, fiscal incentives and subsidies in order to reduce pollution and waste through the internalization of external costs according to polluter pays principle. On the other hand, the 5th EAP constituted a basis for the EU to implement

[295] Susan Baker, "Sustainable Development as Symbolic Commitment: Declaratory Politics and the Seductive Appeal of Ecological Modernization in the European Union", in *Environmental Politics*, April 2007, Vol. 16, No: 2.
[296] James Connelly and Graham Smith, "*Politics and the Environment from Theory to Practice", op.cit. p. 280.*

Agenda 21 and other UNCED Agreements, since it was prepared and issued in parallel to the Rio Conference in 1992 and the launch of Agenda 21. Therefore, it introduced the Community's commitment to sustainable development through following objectives; [297]

- strategies for seven environmental priority issues (climate change, acidification, biodiversity, water, urban environment, coastal zones and waste) and for the management of risks and accidents;
- target sectors into which environmental concerns should be integrated (industry, energy, transport, agriculture and tourism);
- broadening the range of instruments;
- information, transparency of approach and development of the concept of shared responsibility;
- the international dimension reflecting global issues and the Rio Conference.

In 1997, the Treaty of Amsterdam incorporated the sustainability as a core EU objective. Hence, the EU went one step further in sustainability by stating in the Article 6 of the Treaty of Amsterdam that promotion of sustainable development must be integrated into the definition and implementation of all EU policies. Therefore, sustainable development has gradually become an essential pillar and component of the Treaties of the EU. Meanwhile, the 'command and control approach' of 1970 and 1980 has been replaced with 'market based, flexible and cost effective' solutions in 1990s.

Following the adoption of the UNFCCC in 1992 and the Kyoto Protocol in 1997, the European Climate Change Programme (ECCP) was introduced in 2000 in order to identify cost effective and environmental effective measures for cutting greenhouse gas emissions in the EU. It also aimed to guide the EU to meet its target of 8% under the Kyoto Protocol. The "Cardiff Process"[298] of 1998 constituted groundwork for sustainable development and urged

[297] The Fifth Environmental Action Programme, "Towards Sustainability: A European Community Programme of Policy and Action in Relation to the Environment and Sustainable Development", 1992. Available at: http://europa.eu.int/comm/environment/env-act5/5eap.pdf

[298] Cardiff Process was launched by European heads of state and government (The European Council) at their meeting in Cardiff, in June 1998, requiring different Council formations to integrate environmental considerations into their respective activities, putting article 6 of the EC Treaty into practice. The Cardiff process contributed to raising the political profile of integration and also generated a sense of ownership of environmental integration in some Council formations with positive knock-on effects on actions in other EU institutions and Member States. Available: http://ec.europa.eu/environment/integration/integration.htm

the Council to develop strategies integrating environmental concerns into EU policies.[299] In this respect, European Climate Change Programme has been enhanced with adoption of the EU Sustainable Development Strategy[300] in June 2001 at Gothenburg European Council. It asserted that economic growth is not an end in itself and sustainable development is the key objective to achieve balanced and responsible progress in social, economic and environmental spheres.[301]

The Sixth Environmental Action Programme, "Environment 2010: Our Future, Our Choice (2002-2010) promotes the idea that high environmental standards are also engine for innovation and creation of new market and business opportunities. The 6th EAP links environmental policy to the Lisbon Process[302], which targets to make Europe the world's most competitive knowledge-based economy. Given that development of a greener market is promoted, business and citizens would respond with technological and management innovations that stimulate growth, competitiveness, profitability and job creation.[303] The 6th Environmental Action Programme claims that in the right circumstances, environmental taxes can be highly effective in terms of cost and environmental considerations, while providing incentives for companies to research and invest in more environmentally friendly and less resource intensive technologies.[304] The 6th EAP requires preparation of seven thematic strategies on air pollution, marine environment, and sustainable use of resources, waste prevention and recycling, sustainable use of pesticides, soil protection and urban environment.

In 2006 the European Council approved the new EU Sustainable Development Strategy, which aimed to identify and develop actions to enable the EU to achieve continuous improvement of quality of life both for current and future generations. For this purpose, it supports the creation of sustainable communities that are able to manage and use resources

[299] Communication from the Commission to the European Council, "*Partnership for integration - A strategy for Integrating Environment into EU Policies",* COM (98) 333, 1998.
[300] EC, Commission of the European Communities, Communication from the Commission, *"A Sustainable Europe for a Better World: A European Union Strategy for Sustainable Development",* COM/2001/264, Brussels.
[301] EC, Presidency Conclusions of the Gothenburg European Council,15/16 June 2001
[302] In March 2000, the European Council in Lisbon set out a ten-year strategy Lisbon Strategy, known as Lisbon Process, which is a commitment to bring about economic, social and environmental renewal in the EU. It aims to make the EU the world's most dynamic and competitive economy. Under the strategy, a stronger economy will drive job creation alongside environmental and social policies that ensure sustainable development and social inclusion. http://ec.europa.eu/environment/integration/integration.htm
[303] The Sixth Environmental Programme of the EU (EAP), p.11
[304] EC, Commission of the European Communities, Communication from the Commission, *"A Sustainable Europe for a Better World: A European Union Strategy for Sustainable Development",* COM/2001/264, Brussels.

efficiently, to boost the ecological and social innovation potential of the economy while ensuring prosperity, environmental protection and social cohesion. Expanding the strategy into all patterns of policies and sectors, this strategy defined main themes, including climate change and clean energy; sustainable transport; sustainable consumption and production; conversation and management of natural resources; public health; social inclusion, demography, migration; and global poverty and sustainable challenges. In the same vision, it introduced cross cutting policies, including education and training; research and development; financing and economic instruments; communication, mobilizing actors and multiplying success.[305]

Consequently, the EU is eager to promote sustainable development and environmental protection through encouraging sustainable consumption and production, which requires mental transformation in the society. In this respect, in July 2008 the Commission launched an Action Plan on Sustainable Consumption and Production and Sustainable Industrial Policy that aims creation of a dynamic legislative structure to continuously improve the environmental performance of products and foster their utilization by consumers. Given that, Ecodesign Directive sets minimum requirements and voluntary advanced benchmarks for improving environmental performance of 'energy-related' products. On the other hand, the revised Energy Labelling Directive sets mandatory labelling and harmonizes minimum performance product characteristics for public procurement and incentives. In addition, the Council adopted in 2009 the Directive on the Promotion of Clean and Energy Efficient Road Transport Vehicles, which requires consideration of lifetime energy and environmental aspects when purchasing public transport road vehicles.[306]

6.2. Climate Change and the EU Policies

6.2.1. Affects of Climate Change on Europe

The key objectives of the UNFCCC, including combating climate change and minimizing its potential consequences by reducing GHG emissions are also high priority objectives for the European Union. According to studies, the most vulnerable regions to climate change in Europe are Southern Europe, the Mediterranean Basin, Outermost regions and the Arctic, in

[305] See http://ec.europa.eu/environment
[306] EC, European Commission, *"2008 Environment Policy Review",*2009, pp.21-22.

addition, mountain areas, especially the Alps, islands, coastal and urban areas and densely populated floodplains. Due to climate change, grain productivity is expected to decrease in Southern Europe while increasing in the Northern Europe. Moreover, it is estimated that summer heat related mortality and illnesses in Europe will increase through , the reverse effect is expected in winters. Towards the end of the century, the increase in heat related deaths without acclimatization is expected to be more than the reduction in cold related deaths.[307]

Besides, it is expected to face serious increase in extreme weather events like floods and damages due to sea-level rises. Hence, it is forecasted that tourism areas in the Mediterranean coast would move up towards the north, while the conditions of autumn and spring are expected to get better in the Mediterranean. These serious challenges require serious adaptation projects; otherwise the costs of inaction can be great for Europe and the world.[308]

6.2.2. The EU Approach and Leadership in Global Climate Policies

Climate change issues associated with enhanced greenhouse effect started to dominate the international environmental agenda in the 1990s. From the beginning, the EU has been involved in negotiation and development of the UNFCCC while providing financial and scientific support for the IPCC. The EU appeared as the leader of the climate regime, especially after the US denouncement of the Kyoto Protocol in 2001. The EU has been leading the international negotiations on climate change and promoting further commitments of the countries. Nevertheless, the US stayed out of the Kyoto Protocol despite all efforts of the EU.

Although during the 1990s the EU has been the major industrialized leader promoting the international climate change policy, its climate policies have been criticized due to its complexity, slowness and indecisiveness of its institutions. Nevertheless, it has managed to keep its leadership on global climate change regime due to its economic and political weight and its diplomatic experience in cooperation and coalition-building as well as its internal

[307] EC, Commission of the European Communities, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *"Limiting Global Climate Change to 2 degrees Celsius: the Way Ahead for 2020 and Beyond"*, COM/2007/2, Brussels, 10.01.2007.
[308] European Commission, "*EU Action Against Global Warming. Leading Global Action to 2020 and Beyond"*, op.cit, pp. 5-7.

problem-solving capacities. Hence, it can be claimed that the EU possesses the necessary features for a leadership[309] role in global climate regime.

The climate change negotiating position of the EU has three levels: the EU within the global context, the EU institutions and their relations with the EU member states and single EU members within the international context. In the absence of the "European government", the European Commission represents the EU at the international negotiation while the common positions have been agreed by the Member States, with the participation of the Commission.

The transition to a less carbon intensive society should be made in a way that preserves the international competitiveness of European industry, which is described by the Commission as the "cornerstone of EU strategy for sustainable development".[310] As a global example for "whole-of-government", the EU efforts to integrate climate change into pre-existing sector policy frameworks. For example, the EU supports the measures to accelerate investment in energy efficiency through energy policy while promoting mass transport options by transportation policy frameworks. In non-energy sectors, waste minimization and landfill gas recovery and agriculture fertilizer management are examples of pre-existing measures that have been reinforced for reducing emissions. All of these measures have multiple environmental and economic benefits, including reducing GHG emissions.

The EU is the third biggest CO2 emitters in the world, so that it can be assumed that the EU has polluter interests. On the other hand, energy efficiency is very important for the EU due to its dependency on energy imports so that European companies have been working on energy efficient technologies and renewable energies. Hence, international regulations favoring these technologies are for economic interest of these companies since the abatement costs are still moderate within the EU while providing economic gains. There are many advantages of fighting against climate change in Europe and the world. First of all, the air quality improves through the measures to reduce CO_2 and methane concentrations in the atmosphere so this promotes positive effects on human health. Moreover, the measures taken for controlling the

[309] EU leadership in climate change is the result of a dynamic process of competitive multilevel reinforcement among the different EU political poles within a context of decentralized governance. EU leadership has depended upon the actions and commitments of a group of pioneering states and the leadership roles played by the European Parliament and especially, the European Commission.
[310] EC, "*The EU Sustainable Development Strategy*", COM(2005)37 final, 9 February 2005.

climate change improve energy security of Europe. In addition, the introduction of new energy systems leads creating new jobs.[311]

Ensuring competitiveness is one of the biggest challenges of the EU climate policies. In 2007, the Commission launched the new strategy for EU industrial policy[312] that aims to create incentives to unlock the full potential of low carbon or resource-efficient goods, technologies and services in the EU. By this way it targets to make Europe a 'forerunner' in these markets and set the triple objective of competitiveness, energy and environment while calling for an integrated approach to mobilize action by all stakeholders. The main challenge of the EU is to achieve to move to a low-carbon economy while improving the competitiveness of European industry.[313]

In the recent economic crisis, the member states try to restore confidence, protect savings, maintain a flow of affordable credit and improve governance. The crisis is considered by the EU as a crucial opportunity to "green" the economy that lays the foundations for low-carbon and resource-efficient growth. In this respect, stronger European environment policy can help glow economic recovery while promoting lasting EU competitiveness.

The recently adopted European Economic Recovery Plan (EERP)[314], which is the EU's response to the economic crisis, encourages the Member States to invest in a low-carbon economy by promoting energy efficiency and green products. The European Economic Recovery Plan suggests proposals relating to climate change investments, including modernizing European infrastructure, promoting energy efficiency in buildings and consumption of green products. These measures are supposed to facilitate further adaptation to climate change.

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[311] The study of the European Trade Union Confederation indicates that the overall impact of climate change policies on employment will be positive. For example, the Biomass Action Plan is estimated to create 250.000 to 300.000 additional jobs in the EU. In addition, wind energy is developing quickly. Only in Germany, Denmark and Spain, 120.000 people are working in this sector and its potential is expected to increase in the upcoming years. EC, European Commission, Communication on the *"Mid-term Review of Industrial Policy: a Contribution to the EU's Growth and Jobs Strategy",* COM/2007/374, Brussels.

[312] *Ibid.*

[313] Gunnar Still, Noriko Fujiwara and Christian Egenhofer, "*Making The Most of the G8+5 Climate Change Process Accelerating Structural Change and Technology Diffusion on a Global Scale", op.cit.* p.16.

[314] See http://ec.europa.eu/commission_barroso/president/pdf/Comm_20081126.pdf

6.2.3. The EU Climate Policies within the UNFCCC and Kyoto Protocol

The European Commission has been taking climate-related initiatives since the publication of first Community Strategy in 1991 to limit CO2 emissions and improve energy efficiency. The Strategy included proposals to promote electricity from renewable energy, voluntary commitments by car makers to improve fuel economy and proposals on taxation of energy products. Initially proposed policies and measures focused on the energy, transport and industry sectors, however the scope has been broadened to other sectors such as agriculture, forestry and waste.

Rio Earth Summit in 1992 agreed on Agenda 21- blueprint for sustainable development- which provided a stage for signature of the United Nations Framework Convention on Climate Change (UNFCCC) and Convention on Biodiversity. It also provided a significant opportunity for development of European environmental identity and growth of related capacities as an actor in the new environmental diplomacy. Participation in international environmental discourse stimulated domestic action and helped to integrate sustainability concepts in the EU policies, principles and measures.[315] Soon after the Rio Conference, the EU has started integrating environmental concerns to other sectors, despite the implementation has been very slow. It can be argued that although the EU is the pioneer of sustainable development and environmental protection, its approach is still the "weak" form of sustainable development, since its policies and rhetoric emphasize more on the need to foster ecological modernization.

Under the Kyoto protocol the EU-15 has the objective to reduce its GHG emissions by 8% compared to 1990 base year level by 2008-2012. Except Cyprus and Malta, almost all Member States have individual targets under the Kyoto Protocol. Most of the new Member States have the same target. The target for Hungary and Poland is -6% while Cyprus and Malta are no Annex-I Parties to the UNFCCC and thus have no target.

European Climate Change Programme (ECCP) was launched in June 2000 in order to identify and develop all necessary elements of EU strategy to implement the Kyoto Protocol. The first phase of the ECCP aimed to develop further policies and measures and focused on the energy,

[315] Pamela S. Chasek, Janet W. Brown, David L. Downie, "*Global Environmental Politics",* Westview Press, US, 2006.

transport and industry sectors while the second phase, which took place between 2002 and 2003, supported implementation of the measures taken in the first phase. Especially, it focused on the promotion of renewables in heating applications.

In October 2005, the Second European Climate Change Programme was launched with the overall aim to provide the EU climate change policy with a new policy framework for the post-2012 climate regime. The 2nd ECCP reviewed what has been achieved with 1st ECCP and focused further on carbon capture and storage, inclusion of the transport sector into the ETS and adaptation policies. Carbon capture and storage and transport emissions have been focused in this respect.[316] There has been some degree of emission reductions in EU Member States due to a range of specific policies and measures, including implementation of those set at EU level under the umbrella of the European Climate Change Programme.[317] For example, the directive on the promotion of electricity from renewables[318] and introduction of the EU's CO2 Emissions Trading Scheme contributed to the emission reductions in the EU.

As a leading partner of the Kyoto Protocol, the EU is keen on pushing the Protocol forward and taking measures against climate change in national, EU and global levels. The EU is at the forefront in formulating climate policies. The EU Council indicated that the long-term objective of the European Union climate policy is to prevent that global mean temperature increases beyond 2 °C over pre-industrial level.[319] In order to reach that goal, there is a need for further actions beyond the Kyoto targets. In this respect, in January 2007, the Commission presented its "Energy-climate Change Package and a new Communication "Limiting Global Climate Change to 2 °C: the way ahead for 2020 and beyond" by which the Commission proposed to reduce GHG emissions unilaterally by 20% compared to 1990by 2020.[320]

In January 2008, the European Commission put forward the Climate Action and Renewable Energy Package and European Parliament and Council reached an agreement on the package in December 2008. The package, which is expected to come into effect by 2011, aims to help

[316] EEA, European Environment Agency Report, *"Energy and Environment in the European Union. Tracking Progress Towards Integration"*, No 8, Copenhagen, 2006.
[317] EC, European Commission, European Climate Change Programme, 2006. Available at: http://ec.europa.eu/comm/environment/climat/eccp.htm
[318] EC, Council Directive on the promotion of electricity produced from renewable energy sources in the internal electricity market, European Parliament and Council, 2001/77/EC, September 2001.
[319] EC, European Commission, *"Limiting Global Climate Change to 2 degrees Celsius: the way ahead for 2020 and beyond"*.
[320] *ibid*

to transform Europe into a low-carbon economy and increase its energy security.[321] In this respect, the EU is committed reducing its overall emissions to at least 20% below 1990 levels by 2020 as well as increasing the share of renewables in energy use to 20% by 2020. Moreover, the EU declared that it is ready to commit 30% reduction of GHG emissions under a new global climate change agreement when other developed countries make comparable efforts. The overall EU effort appears approximately adequate to meet Kyoto obligation, which is to reduce emissions collectively 8% comparing to 1990 levels in 2008-2012 commitment period. However, the EU has to more comprehensive actions in order to meet new stated commitments.

6.2.3.1. Burden Sharing System within the EU

Kyoto Protocol allows any group of Parties to jointly fulfill their commitments. It specifies that the combined assigned amounts in Annex B may be redistributed through internal agreement and notified to the Secretariat.[322] With the Joint Fulfillment of Commitments described in Article 4 of Kyoto Protocol, the EU could "bubble".

The EU signed the Kyoto Protocol on 29 April 1998 and declared that "the European Community and its Member States will fulfill their respective commitments under Article 3, paragraph 1, of the Protocol jointly and in accordance with the provisions of Articele 4." Therefore, the first bubble under the Kyoto Protocol was announced. The level of industrialization and economic growth of the EU states also differs. Although the EU Member States collectively bound themselves to reduce their GHG emissions by 8% between 2008 and 2012, the "System of Burden Sharing" was created in order to keep the economic and social stability within the EU.[323]

Regarding the climate change policies of the EU, the member states can be examined in three groups. The first group is the so-called "rich and green" countries, including, Austria, Denmark, Finland, Germany, the Netherlands and Sweden, which can respond quickly to the environmental problems. The second group is the "rich but less green" members, including, Belgium, Britain, France, Italy and Luxemburg. They are more reluctant in environmental

[321] See http://ec.europa.eu/environment/climat/climate_action.htm See also http://ec.europa.eu/climateaction/docs/climate-energy_summary_en.pdf
[322] Joint Fullfilment of Commitments, Kyoto Protocol, Article 4.
[323] See http://www.iklimlerdegisiyor.info/turkce/index.php

protection than the first group and they consider that the costs of environmental protection might slow down their economies. The third group is composed of the "least green and poor" members, namely; Spain, Portugal, Greece and Ireland. These countries have blocked several initiatives such as the common carbon tax. Their main concerns are the slowing down of economic development as well as the inadequate administrative capacity in the environmental sphere.[324] Consequently, in order to distribute the responsibility in accordance to the social ad economic capacities of the member states, the EU launched the system of burden sharing.

Through burden sharing system, each of the member states has a national target according to individual circumstances, like the size of the economy, the opportunities for reductions and emissions per capita. Among fifteen member states eight of them (Luxemburg, Austria, Belgium, Netherlands, Denmark, Italy, United Kingdom and Germany) were given reduction targets while five of them (Spain, Greece, Portugal, Ireland and Sweden) were allowed to increase their GHGs. Accordingly, Germany will reduce the GHG emissions 21% below 1990s levels while Greece can increase 25% and Portugal 27%. The former accession countries that joined the EU in May 2004 and in 2007 are not part of this Burden Sharing Agreement, but they also have their own Kyoto targets.[325]

Table 6.1 Kyoto Burden-Sharing Targets for EU-15 Countries

Country	Burden-Sharing Target	Country	Burden-Sharing Target
Spain	+15.0%	Austria	-13.0%
Greece	+25.0%	Belgium	-7.5%
Portugal	+27.0%	Netherlands	-6.0%
Ireland	+13.0%	Denmark	-21.0%
Sweden	+4.0%	Italy	-6.5%
France	0%	United Kingdom	-12.5%
Finland	0%	Germany	-21%
Luxembourg	-28.0%		

Source: European Environment Agency

[324] Lasse Ringius, "*The European Community and Climate Protection: What's Behind the Empty Rhetoric?",* Center for International Climate and Environmental Research (Cicero) Report, Oslo, October, 1999, p.17-18.
[325] Klepper, Gernot and Sonja Peterson, "Emissions Trading, CDM, JI and More: The Climate Strategy of the EU", *The Energy Journal*, Vol.27, No.2, 2006, pp: 3-7.

6.2.3.2. EU Tools for Mitigation and Adaptation

The EU plans to meet its commitment under the Kyoto Protocol, through the EU-level measures, which are identified under the ECCP, existing or planned domestic action by Member States and use of the Kyoto Protocol's flexible market mechanisms.[326] Hence, the EU has a hybrid system on climate change. The EU Member States utilize generally three policies to reduce their GHG emissions. The first one is the European Emissions Trading Scheme (ETS)[327] through which the Member States try to reduce domestic CO2 emissions resulting from energy intensive installations, namely domestic reductions covered by the ETS. Secondly, the Member States try to reduce the domestic CO2 emissions in the sectors not covered by the ETS. They also try to reduce the emissions of other GHGs through domestic reductions outside the ETS and GHGs other than CO2. Thirdly, they apply Clean Development Mechanism (CDM) and Joint Implementation (JI), which are reductions abroad.[328]

The EU Emissions Trading Scheme (ETS), which was established by Directive 2003/87/EC in 2005, aims to promote cost-efficiency to the member states in reaching their emission reduction commitments. Moreover, it is considered as the "biggest international trading scheme and a key pillar of the fast-growing global carbon trading market".[329] Emission trading is an instrument for environmental protection and a policy instrument that does not damage competitiveness and provide target levels to be achieved without slowing down economic growth. The EU-ETS aims emissions reductions to be achieved where cheapest and cost-effective.[330]

In 2004 the Linking Directive linked the EU-ETS to the Kyoto Protocol so that companies can earn carbon allowances through the flexible mechanisms of the Kyoto Protocol, namely Joint

[326] EC, European Commission, *"Reducing Emissions From the Energy And Transport Sectors. EU Action Against Climate Change",* Brussels, 2006, p.6.
[327] The EU ETS contains 30 countries, including Norway, Iceland and Liechtenstein besides EU 27.
[328] Klepper, Gernot and Sonja Peterson, *op.cit*. p.2
[329] European Commission, 2007, "*EU Action Against Global Warming. Leading Global Action to 2020 and Beyond",* p.10-11.
[330] Under the Kyoto Protocol, if all the countries would take place in the CO2 emissions trading system, it is estimated that a 40% cost savings would be achieved compared to no trading. The EU Commission estimates that the EU trading by energy producers and energy intensive industry has the potential of reducing the implementation costs of EU's Kyoto commitments by nearly a fifth compared to the case where separate members implement their own schemes domestically. This potential savings is approximately €1.7 billion on an annual basis.

Implementation and Clean Development Mechanism, and then use these allowances for the emissions reduction targets in the ETS. This option offers companies a cheaper way of emissions cutting.[331] For instance, a company operating under the ETS might fulfill its commitments only through CDM or JI credits. In addition, the EU governments can also use the CDM and JI credits to reach their Kyoto targets.[332]

The pilot phase of the ETS has been between 2005 - 2007, which continues through the first commitment period (2008-2012) and beyond. It extends to all EU Member States, including all new member states. Within the 'cap-and-trade' system of ETS, the governments give to operators' emission allowances to emit a certain level of CO2 per year. The total of these allowances creates a 'cap' on overall emissions from the installations. Operators must surrender the number of allowances equal to their actual emissions in every year.[333]

In addition to national adaptation policies, the EU's Adaptation Framework aims to improve the EU's resilience to adapt climate change. This framework, which respects the principle of subsidiary and supports overarching EU objectives on sustainable development, adopts a phased approach. It is expected that the measures of the first phase (2008-2012) will lay the ground work for preparation of a comprehensive EU Adaptation Strategy to be implemented during the second phase, starting from 2013. Four pillars of actions of the first phase are; 1) building a solid knowledge base on the impact and consequences of climate change for the EU, 2) integrating adaptation into EU key policy areas; 3) employing a combination of policy instruments (market-based instruments, guidelines, public-private partnerships) to ensure effective delivery of adaptation and 4) stepping up international cooperation on adaptation.[334]

In 2008 the European Council and Parliament reached an agreement on the inclusion of aviation in the EU ETS. Accordingly, from 2012 GHG emissions from flights to, from and within the EU will be included in the ETS. Solidarity among EU Member States is vital to ensure that disadvantaged regions, which are the most affected by climate change, will be capable of taking the adaptation measures. In addition, coordinated EU action is essential in

[331] Klepper, Gernot and Sonja Peterson, *op.cit*., p.1.
[332] The governments are obliged to consider supplementary, ethic is set by the Marrakesh Accords to the Kyoto Protocol. Accordingly, "the use of the mechanisms (International Emissions Trading, CDM and JI) shall be supplemental to domestic action and that domestic action shall thus constitute a significant effort". Klepper, Gernot and Sonja Peterson, *op.cit*. p 5.
[333] Pamela S. Chasek, Janet W. Brown, David L. Downie, *"Global Environmental Politics", op.cit.*p.4-7.
[334] EC, European Commission, "*White Paper Adapting to Climate Change: Towards a European Framework for Action",* COM/2009/147/4, Brussels, p.7.

some sectors, including agriculture, water, biodiversity, fisheries, and energy networks, which are closely integrated at EU level through the single market and common policies. Another major cross-cutting EU measure is the directive on Integrated Pollution Prevention and Control (IPPC)[335], which sets common rules for permitting certain types of industrial installations. Accordingly, operating permits must be based on Best Available Techniques (BAT) and cover the entire environmental performance of a plant, including its energy efficiency and emissions of nitrogen compounds and fluorine compounds.[336]

6.2.3.3. Promoting Climate Policy outside the EU: The Global Climate Change Alliance (GCCA)

The climate change affects directly or indirectly several policy areas while the impacts vary from region to region depending on physical vulnerability, the degree of socio-economic development, natural and human adaptive capacity, health services and disaster surveillance mechanisms.[337] Hence, 'one-size-fits-all' approach to adaptation will not be appropriate, so adaptation will require a cross-boundary approach". The EU's Climate Adaptation Strategy underlines the social dimension "in order to ensure that the poorer and disadvantaged regions and those regions that will be hit hardest by climate change will be able to take the necessary measures".[338] The Commission emphasizes importance of defining an appropriate division of labor between the different levels of government, while pointing the need to consider how adaptation can be taken into account in EU spending programmes, such as the Structural and Cohesion spending programmes.[339]

The Green Paper on Adaptation Options for Europe urges integrating climate change into existing external policies and funding instruments, and designing new policies where

[335] The IPPC directive has applied to new industrial installations since 1999; plants that were already in operation at that time must comply by October 2007.
[336] EC, European Commission, *"Reducing Emissions From the Energy and Transport Sectors. EU Action Against Climate Change",op.cit*. p.7.
[337] Stine Aakre and Dirk. Rübbelke, "Adaptation to Climate Change in The European Union: Efficiency vs. Equity Considerations", *CEPS Working Document,* No. 301, September 2008, p.1
[338] EC, European Commission, Green Paper from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, *"Adapting to Climate Change in Europe-Option for EU Action"*, COM/2007/354, Brussels, 29.6.2007, pp. 11-12.
[339] Stine Aakre and Dirk. Rübbelke, *op.cit*., p.1

appropriate.[340] For the purpose of engaging developing countries and economies in transition, in March 2008 the EU launched the Global Energy Efficiency and Renewable Energy Fund (GEEREF) under the Environment and Natural Resources Thematic Programme (ENRTP). This public-private investment fund aims to provide risk capital to regional funds that invest in smaller-scale projects. GEREF provides funds to support small- and medium-sized energy projects in line with supporting sustainable development in developing economies and economies in transition. It aims to maximize the leverage of public funds in raising finance for investment in energy efficiency and renewable energy projects.[341]

The European Commission has launched a number of initiatives to support developing countries in their efforts to mitigate and adapt to climate change.[342] In this respect, the Global Climate Change Alliance (GCCA), which became fully operational in 2008, is the key element of the EU's external development action in respect to climate change.[343] It provides a platform of dialogue, exchange and practical cooperation between the EU and developing countries that are most vulnerable to climate change, particularly the least developed countries (LDCs) and small island developing states (SIDS). The Alliance aims to increase capacities of these countries to adapt to climate change and to support their participation in global mitigation efforts.

The Alliance serves to the commitments of the EU Action Plan on Climate Change and Development, which aims to systematically integrate climate change into development cooperation. The developing countries will be supported to realize integration of development strategies and climate change through regular meetings between the EU and participating countries within the framework of the GCCA. Besides dialogue and exchange, the GCCA provides technical and financial support for the measures aiming in adaptation, mitigation and integration of climate change into development strategies. Within the Alliance the EU

[340] EC, European Commission, Green Paper from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, *"Adapting to Climate Change in Europe-Option for EU Action"*.
[341] Arno Behrens, *op.cit.* p 4.
[342] The EU also develops bilateral technology partnerships with some of the emerging countries. For instance, through the EU-China clean energy partnership, a demonstration coal power plant is built in China, which aims to have zero CO2 emissions resulting from the application of CO2 capture and storage technology. The EU also has a Clean Development and Climate Change Initiative with India, also covering the application of Kyoto Protocol's Clean Development Mechanism.
[343] See European Commission, Building a Global Climate Change Alliance between the European Union and poor developing countries most vulnerable to climate change, Communication from the Commission to the Council and the European Parliament, COM(2007) 540.

provides assistance on five areas: 1) developing and implementing concrete adaptation strategies, 2) reducing emissions from deforestation, 3) helping poor countries to take advantage of the Clean Development Mechanism (CDM), 4) helping developing countries to be better prepared for natural disasters and 5) integrating climate change into development cooperation and poverty strategies. In this framework, priority is given to adaptation, disaster risk reduction and climate change integration.[344]

In 2009 the Commission issued a White Paper that sets a framework covering the period of 2009-2012 in order to improve the EU's resilience to a changing climate.[345] The framework aims to complement Member State efforts, while supporting efforts by neighboring and developing countries, particularly through the Global Climate Change Alliance initiative under the ENRTP. As the main instrument for climate change related funding in European Commission development cooperation, the ENRTP addresses the environmental dimension of development and other external policies and serves promotion of the EU's environmental and energy policies abroad.[346]

6.3. EU Emission Trends

Under the Kyoto Protocol, the EC has commitment to reduce its GHG emissions by 8 % in the first phase of 2008–2012 compared to the base year of 1990. The EC plans to achieve this target by existing and planned domestic policies as well as measures, carbon sinks and Kyoto mechanisms.

The EU accounts for about 10.5 % of global greenhouse gas emissions.[347] Total EU 27 GHG emissions, without Land Use, Land-Use Change and Forestry (LULUCF), decreased by 7.7 % between 1990 and 2006 and decreased by 9.3% between 1990 and 2007. On the other hand, in 2007 in the EU-15 total GHG emissions, without LULUCF, were 4.3% below 1990 levels.[348]

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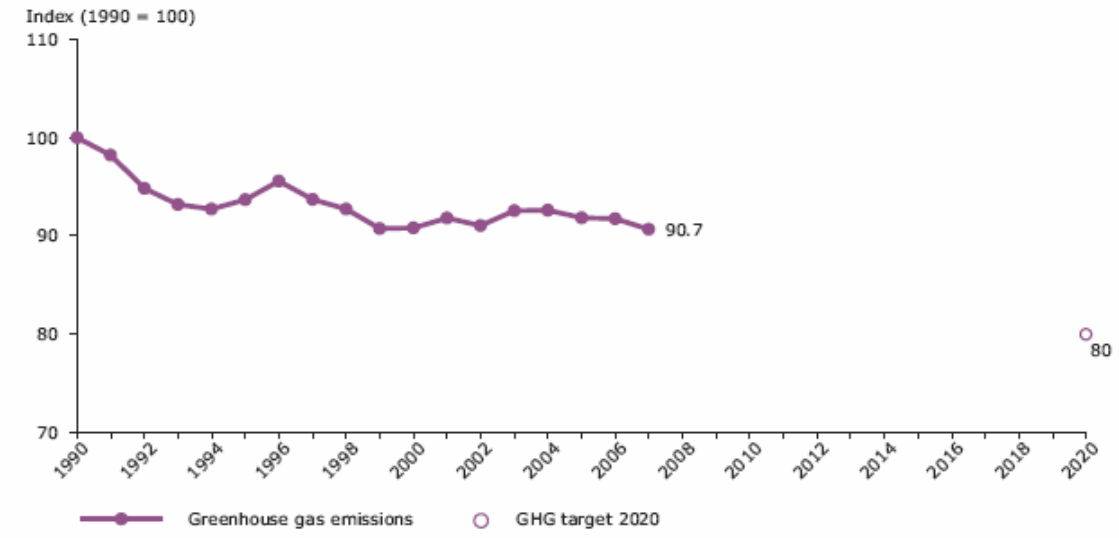
[344] Arno Behrens, *op.cit*., p.3-4.
[345] EC, European Commission, *"White Paper Adapting to Climate Change: Towards a European Framework for Action",* COM/2009/147/4, Brussels.
[346] Arno Behrens, *op.ci.t*, p.9.
[347] EEA, European Environment Agency, *"Greenhouse Gas Emission Trends and Projections in Europe 2008 Tracking Progress Towards Kyoto Targets",* No5, Copenhagen, 2008, p.6.
[348] EEA, European Environment Agency, *"Annual European Community Greenhouse Gas Inventory 1990–2007 and Inventory Report 2009 Submission to the UNFCCC Secretariat Version",* Technical report No 4, Copenhagen, 2009, p.6.

Figure 6.1 EU 27 GHG Emissions 1990–2007 (excluding LULUCF)



Note: GHG emission data for the EU-27 as a whole refer to domestic emissions (i.e. within its territory) and do not include emissions and removals from LULUCF or emissions from international aviation and international maritime transport. CO2 emissions from biomass with energy recovery are reported as a Memorandum item according to the UNFCCC Guidelines and not included in national totals. In addition, no adjustments for temperature variations or electricity trade are considered. The global warming potentials are those from the 1996 revised IPCC Guidelines for National Greenhouse Gas Inventories.

Source: EEA, European Environment Agency, *"Annual European Community Greenhouse Gas Inventory 1990–2007 and Inventory Report 2009 Submission to the UNFCCC Secretariat Version",* Technical report No 4, Copenhagen, 2009.

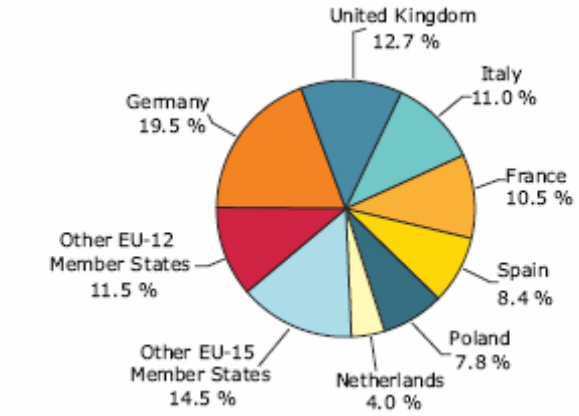
Between 2006 and 2007, EU-15 emissions decreased by 1.6%, comparing to 1.2 %reduction in the EU-27. This was due to the larger increase of CO2 emissions from public electricity, heat production and road transport in the EU-27, and smaller emission decreases from manufacturing industries. The EU-27 achieved higher reductions than the EU-15 because of substantial decreases in the Czech Republic, Hungary and Poland.[349]

The largest emitters of GHGs within the EU are Germany, the United Kingdom, Italy, France and Spain, which in total accounted collectively for more than 60 % of EU27 GHG emissions in 2007. Among these countries, as the largest emitters, Germany and the United Kingdom accounted for about one third of total EU-27 GHG emissions. Indeed, they achieved important reductions of total GHG emission 393 million tones CO2-equivalents compared to 1990. Germany's emission reductions are related to the increasing efficiency in power and heating plants and the economic restructuring after the German reunification. On the other hand, the

[349] EEA, European Environment Agency, *"Annual European Community Greenhouse Gas Inventory 1990–2007 and Inventory Report 2009 Submission to the UNFCCC Secretariat Version", op.cit*., 2009, p.8

UK achieved reductions due to liberalization of energy markets and the subsequent fuel switches from oil and coal to gas in electricity production and N2O emission reduction measures in adipic acid production.[350] Hence, the UK achieved important emission reduction due to its policies on restructuring the energy supply industry, energy efficiency improvements and pollution control measures in the industrial sector. Another success story is Sweden that succeeded in decreasing its emissions by improving energy efficiency and increasing the proportion of renewable energy and decreasing the share of organic waste sent to landfill.[351]

Figure 6.2 Share of 2006 GHG Emissions in the EU27, by Main Emitting Countries



Source: EEA, European Environment Agency, *"Greenhouse Gas Emission Trends and Projections in Europe 2008 Tracking Progress Towards Kyoto Targets",* No5, 2008.

As the third and fourth largest emitters, Italy and France constitute 11 % of total EU 27 emissions. In 2007 Italy's GHG emissions accounted about 7 % above 1990 levels due to GHG emissions from road transport, electricity, heat production and petrol refining. On the other hand, France's emissions decreased by 6 % in 2007 comparing to 1990 levels. France achieved this by reduction of N2O emissions from acid production while CO2 emissions from road transport increased considerably in this period. Following Italy and France, the fifth and sixth largest emitters are Spain and Poland, which account for 9 % and 8 % of total EU-27 GHG emissions. Between 1990 and 2007 emissions of Spain increased radically by 54 % due to emission increases from road transport, electricity, heat production, and manufacturing industries. On the other hand, in the same period, Poland decreased GHG emissions by 13 %

[350] *ibid*, p.13
[351] EC, Commission of the European Communities, Communication from the Commission to the Council and the European Parliament, *"2008 Environment Policy Review", op.cit*., p.12

as a result of the decline of energy inefficient heavy industry and the overall restructuring of the economy in the late 1980s and early 1990s, as in many other new member states. In contrast to this reduction, there was a notable increase of emissions in sector of transport.[352]

Table 6.2 Greenhouse Gas Emissions in CO2-equivalents (excluding LULUCF) and Kyoto Protocol Targets for 2008–2012

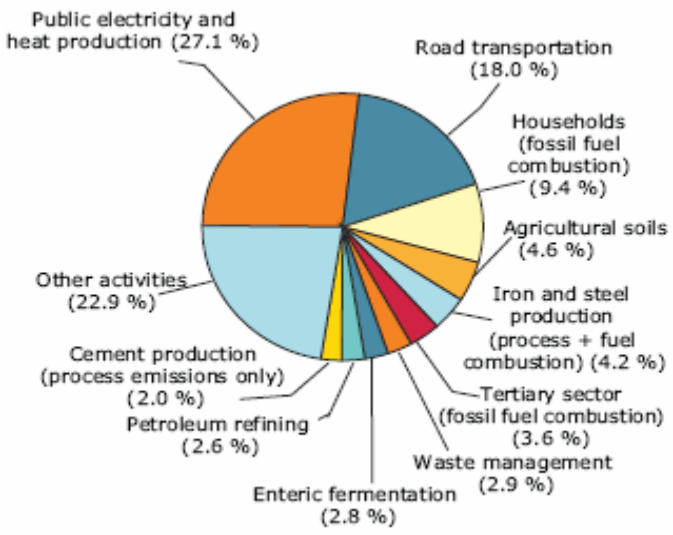
Member State	1990	Kyoto Protocol base year a)	2007	Change 2006–2007	Change 2006–2007	Change 1990–2007	Change base year 2007	Targets 2008–2012 under Kyoto Protocol and 'EU burden sharing'
	(million tonnes)	(million tonnes)	(million tonnes)	(million tonnes)	(%)	(%)	(%)	(%)
Austria	79.0	79.0	88.0	– 3.6	– 3.9 %	11.3 %	11.3 %	– 13.0 %
Belgium	143.2	145.7	131.3	– 5.3	– 3.9 %	– 8.3 %	– 9.9 %	– 7.5 %
Denmark	69.1	69.3	66.6	– 4.4	– 6.2 %	– 3.5 %	– 3.9 %	– 21.0 %
Finland	70.9	71.0	78.3	– 1.6	– 2.0 %	10.6 %	10.3 %	0.0 %
France	562.6	563.9	531.1	– 10.6	– 2.0 %	– 5.6 %	– 5.8 %	0.0 %
Germany	1 215.2	1 232.4	956.1	– 23.9	– 2.4 %	– 21.3 %	– 22.4 %	– 21.0 %
Greece	105.6	107.0	131.9	3.8	2.9 %	24.9 %	23.2 %	25.0 %
Ireland	55.4	55.6	69.2	– 0.5	– 0.7 %	25.0 %	24.5 %	13.0 %
Italy	516.3	516.9	552.8	– 10.2	– 1.8 %	7.1 %	6.9 %	– 6.5 %
Luxembourg	13.1	13.2	12.9	– 0.39	– 2.9 %	– 1.6 %	– 1.9 %	– 28.0 %
Netherlands	212.0	213.0	207.5	– 1.0	– 0.5 %	– 2.1 %	– 2.6 %	– 6.0 %
Portugal	59.3	60.1	81.8	– 2.9	– 3.4 %	38.1 %	36.1 %	27.0 %
Spain	288.1	289.8	442.3	9.3	2.1 %	53.5 %	52.6 %	15.0 %
Sweden	71.9	72.2	65.4	– 1.5	– 2.2 %	– 9.1 %	– 9.3 %	4.0 %
United Kingdom	771.1	776.3	636.7	– 11.2	– 1.7 %	– 17.4 %	– 18.0 %	– 12.5 %
EU-15	**4 232.9**	**4 265.5**	**4 052.0**	**– 64.0**	**– 1.6 %**	**– 4.3 %**	**– 5.0 %**	**– 8.0 %**
Bulgaria	117.7	132.6	75.5	4.2	5.9 %	– 35.8 %	– 43.0 %	– 8.0 %
Cyprus	5.5	Not applicable	10.1	0.2	1.6 %	85.3 %	Not applicable	Not applicable
Czech Republic	194.7	194.2	150.8	1.7	1.2 %	– 22.5 %	– 22.4 %	– 8.0 %
Estonia	41.9	42.6	22.0	2.8	14.8 %	– 47.5 %	– 48.3 %	– 8.0 %
Hungary	99.2	115.4	75.9	– 2.9	– 3.7 %	– 23.5 %	– 34.2 %	– 6.0 %
Latvia	26.7	25.9	12.1	0.4	3.5 %	– 54.7 %	– 53.4 %	– 8.0 %
Lithuania	49.1	49.4	24.7	1.9	8.1 %	– 49.6 %	– 49.9 %	– 8.0 %
Malta	2.0	Not applicable	3.0	0.07	2.3 %	45.7 %	Not applicable	Not applicable
Poland	459.5	563.4	398.9	– 0.4	– 0.1 %	– 13.2 %	– 29.2 %	– 6.0 %
Romania	243.0	278.2	152.3	– 1.6	– 1.0 %	– 37.3 %	– 45.3 %	– 8.0 %
Slovakia	73.3	72.1	47.0	– 2.0	– 4.1 %	– 35.9 %	– 34.8 %	– 8.0 %
Slovenia	18.6	20.4	20.7	0.2	0.7 %	11.6 %	1.8 %	– 8.0 %
EU-27	**5 564.0**	**Not applicable**	**5 045.1**	**– 59.4**	**– 1.2 %**	**– 9.3 %**	**Not applicable**	**Not applicable**

Source: EEA, European Environment Agency, *"Annual European Community Greenhouse Gas Inventory 1990–2007 and Inventory Report 2009 Submission to the UNFCCC Secretariat Version",* Technical report No 4, 2009.

[352] EEA, European Environment Agency, *"Annual European Community Greenhouse Gas Inventory 1990–2007 and Inventory Report 2009 Submission to the UNFCCC Secretariat Version", op.cit*., p.p.12-13.

Upon the latest projections from Member States, it is expected that the EU-15 will achieve its 8% reduction target through a combination of policies and measures already taken, the purchase of emissions credits from projects in third countries, and forestry activities that absorb carbon from the atmosphere. (Table 6.2) Eight member states among EU-15, including Belgium, Germany, Greece, Ireland, the Netherlands, Portugal, Sweden and the United Kingdom, have projected to achieve their targets through existing policies and measures, carbon sinks and the Kyoto mechanisms. In addition, Austria, Finland, France and Luxembourg are expected to reach their targets. On the other hand, Denmark, Italy and Spain have projected not to reach their Kyoto targets.[353] Although emissions of the most of the new Member States are projected to increase between 2006 and 2010, nine of them, which have a Kyoto target, are expected to meet or even over-achieve their Kyoto targets applying only existing policies and measures.[354] Several Member States have developed strategies to meet the targets set by the Kyoto agreements while developing internal CO2 trading systems as a part of these strategies.

Figure 6.3 Share of 2006 GHG Emissions in the EU27, by main activity



Source: EEA, European Environment Agency, *"Greenhouse Gas Emission Trends and Projections in Europe 2008 Tracking Progress Towards Kyoto Targets",* No5, 2008.

[353] *ibid*, p.13
[354] European Commission, Communication from the Commission to the Council and the European Parliament, 2008 Environment Policy Review, *op.cit* .p.14.

Accounting for 79% in 2007, the largest portion of total EU-27 emissions stem from the energy sector, which is followed by agriculture (9.2%) and industrial processes (8.5%). GHG emissions have increased constantly each year since 1990 only in the transport sector, which accounts for 17% of total GHG emissions in 2007. It is recorded that GHG emissions from international aviation and shipping activities continued to rise in 2007, increasing by 1.8 % in the EU-27. Nevertheless, contributions from these sectors, currently not included in the national GHG totals.[355]

Concerning high portion of energy sector in GHGs, the EU promotes renewable energy. In 2007, the share of renewable energy sources in total electricity of the EU was 15.6%, which is far off the EU target that aims generation of 21% of electricity from renewable energy sources by 2010. The most important renewable energy source in the EU is hydropower, accounting 9.2% of total electricity consumption. It is followed by wind (3.1%) and biomass (3.0%). Accounting 59.8%, Austria has the highest share of electricity from renewables, which is followed by Sweden with 52.1% in 2007.

In order to reduce the emissions, the EU promotes decreasing energy intensity, which reflects the energy consumption of an economy and its overall energy efficiency. In this respect, it is calculated as the ratio of gross inland energy consumption divided by the gross domestic product (in constant prices, base year 1995). In this respect, improving energy efficiency contribute considerably to reduction of GHG emissions, while contributing to reduction of energy bills, increasing energy security, creating jobs, supporting low-earning households and even promoting boost of exports and innovation.[356]

6.4. EU Policies Towards the Post-2012 Climate Regime

6.4.1. A New European Energy and Climate Strategy

Since early 1990s the EU has taken actions to reduce greenhouse gas emissions from the energy sector and encourage development of new and cleaner technologies, within the context of liberalized energy markets. The EU energy policy aims to develop renewable energy

[355] EEA, "*Annual European Community Greenhouse Gas Inventory 1990–2007 and Inventory Report 2009 Submission to the UNFCCC Secretariat"*, *op.cit*. p.18.
[356] European Commission, Commission Staff Working Document Accompanying the Communication from the Commission to the Council and the European Parliament 2008 Environment Policy Review, *op.cit*, .p.16-17.

sources due to the benefits of having clean, sustainable and secure energy supplies. The EU policies promote indigenous production and use of renewable energy in order to reduce simultaneously its carbon dioxide emissions and decrease its external energy and carbon dependency. Accounting for 79% of the total GHGs in 2007, energy production and consumption, including transport, industry, households and services, are the largest sources of GHG emissions in the EU-27.[357] Therefore, in order to reduce its total emissions, the EU focuses on energy and transport sectors. In this respect, the EU takes actions to diminish reliance on greenhouse gas-producing fossil fuels, and to reduce emissions from their use through a range of targeted policies and measures. These include improving energy efficiency, promoting renewable energy sources and increasing market share of environment-friendly modes of transport.

Energy policy is the key element of the European Union's efforts to address the Lisbon Agenda, to achieve the Kyoto Protocol target for 2008–2012 and to guarantee energy security for its citizens.[358] Energy is set as one of four 'priority action areas' identified in the Commission's Annual Progress Report on the Lisbon Agenda.[359] In this respect, reliable, affordable and sustainable flows of energy are key elements for economic development and achievement of the Lisbon goals. There is an obvious link between energy security, sustainability and competitiveness.

In 2005, the European Commission issued a strategy called "Winning the Battle Against Climate Change", which seeks strategies for the post-2012 climate regime. Major points of the strategy are; 1) bringing all major world emitters together under a single binding scheme, including especially the US, India and China, 2) increasing the number of those sectors which can trade emissions within emissions trading scheme and to limit deforestation; 3) supporting climate-friendly technologies; 4) increasing the use of market-based instruments like the EU-ETS; 5) developing adaptation policies both in Europe and on a global scale.[360]

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[357] EEA, "*Annual European Community Greenhouse Gas Inventory 1990–2007 and Inventory Report 2009 Submission to the UNFCCC Secretariat", op.cit*. p.18.

[358] EC, 2005, European Commission Reference Documents on Sustainable Development. Available at: http://ec.europa.eu/comm/environment/eussd/.

[359] EC, *The European Commission's 2006 Annual Progress Report on Job and Growth*, 2006, Available at: http://ec.europa.eu/growthandjobs/annual-report_en.htm.

[360] EC, Commission of the European Communities, Communication from the Council to European Parliament, the European Economic and Social Committee and the Committee of Regions, *"Winning the Battle Against Global Climate Change"*, COM/2005)/5, Brussels, 09.02.2005.

With the initiation of EU energy policy in spring 2006, the Commission published Green Paper 'A European Strategy for Sustainable, Competitive, and Secure Energy'[361] in March 2006. The possible principles of Energy Policy for Europe were elaborated by this document. In 2006, the European Council called for an Energy Policy for Europe[362] to support the three objectives of an EU energy policy: security of supply, competitiveness and environmental sustainability, which implies integration of environmental considerations within energy policy. The idea of this kind of integration has been initiated at the Cardiff Summit in 1998 and has been followed by the EU Sustainable Development Strategies of 2001 and 2005 as well as the Sixth Environment Action Programme of 2002 and the renewed Lisbon Strategy in 2005. Through these efforts of strengthening environmental integration within EU energy policy, it is aimed to reduce the environmental impact of the production and use of energy, to promote energy savings and energy efficiency, and to increase the use of cleaner energy and its share of total production.[363]

In January 2007, the EU Commission released its Energy Policy Package "Energy for a Changing World" with proposals in "An Energy Policy for Europe", a "Renewable Energy Roadmap", "Prospects for the internal gas and electricity market", a "Priority Interconnection Plan" for electricity and gas lines, a "Draft nuclear illustrative programme", a Communication on carbon sequestration and storage "Sustainable power generation from fossil fuels: aiming at near-zero emissions by 2020"; and a communication "Towards a European strategic energy technology plan".[364] In March 2007, the European Council adopted a comprehensive Energy Action Plan for the period 2007-2009, based on the Commission's Communication "An Energy Policy for Europe".[365]

Following the agreement at March 2007 European Council, the EU was committed to achieve at least a 20% reduction in its GHG emissions by 2020 compared to 1990 levels and by 30% if other developed countries agree comparable reductions. In January 2008, the Commission adopted Climate and Energy Package with a proposal for a Directive with legally binding targets for increasing the share of renewable energy to 20% by 2020, with 10% share of

[361] EC, European Commission, *"Green Paper, A European Strategy for Sustainable, Competitive and Secure Energy*", COM(2006) 105 final, 2006.
[362] European Council, *"Presidency Conclusions of the Brussels European Council",* 23/24 March 2006, 7775/06, Brussels.
[363] *ibid*
[364] See details in http://www.inforse.org/europe/EU_policy_07-08-06.htm
[365] Brussels European Council 8/9 March 2007, Presidency Conclusions. Available at: http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/93135.pdf

renewable energy in the transport sector; and a regulatory framework for safe, reliable deployment of carbon capture and geological storage technologies.[366] These aspirations are translated into more concrete commitments and actions for each Member State by adopting a "Climate and Energy Package" upon the agreement reached by the European Parliament and the Council in December 2008.[367]

Concerning the further efforts to decrease the emissions towards low carbon economy, there is an agreement on future targets on CO2 emissions from cars with an average emission limit of 130 grams/km to be applied to 65% of new cars in 2012, rising gradually to apply to all cars from 2015. In addition, Parliament and the Council adopted a revised Fuel Quality Directive, which requires a life-cycle GHG emission reduction of 6% for transport fuel by 2020. [368]

On 28 January 2009 the EC published a Communication "Towards a Comprehensive Climate Change Agreement in Copenhagen", that repeats emission reduction targets adopted by the European Council in 2007 and main topics of the EU "Energy and Climate Package" adopted in December 2008. Finally, on 6 April 2009 the Council adopted the Package, which underlines the objective of limiting the rise in global average temperature to no more than 2°C above pre-industrial levels. To achieve this goal Member States agreed to reduce total EU GHG emissions by 20% compared to 1990 by 2020. The Package includes the proposals to improve the EU Emissions Trading System (EU-ETS) by covering more GHGs and more sectors, and by setting a tighter EU-wide emissions cap and emission reduction targets for sectors not in the ETS, such as road transport, buildings, services and agriculture.

It is claimed that the New Energy Policy for Europe will lead to a 'post-industrial revolution', or a low-carbon economy in the EU while leading increased competition in the energy markets, improved security of supply and improved employment prospects. Through the Energy and Climate Package, the EU appears as the first region in the world being committed to such ambitious targets while putting in place the measures needed to achieve them. Hence

[366] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, 20-20 by 2020 Europe's Climate Change Opportunity", COM(2008) 30, Brussels, 23.1.2008
[367] Directive 2009/28/EC, Directive 2009/29/EC, Directive 2009/31/EC and EP Resolution of December 2008 in relation to COM(2008) 17
[368] EC, European Commission, *"2008 Environment Policy Review",* 2009, Brussels, p.15.

the Package demonstrates once more the EU's leadership. Moreover, the package proves that measures for emissions cut are compatible with continued economic growth and prosperity.

The main elements of the Climate-Energy Legislative Package for Europe;[369]

- A cut of at least 20% in carbon dioxide emissions from all primary energy sources by 2020 (compared to 1990 levels), while pushing for an international agreement to succeed the Kyoto Protocol aimed at achieving a 30% cut by all developed nations by 2020.
- increasing use of renewables (wind, solar, biomass, etc) to 20% of total energy production
- cutting energy consumption by 20% of projected 2020 levels - by improving energy efficiency
- A cut of up to 50% in carbon emissions from primary energy sources by 2050, compared to 1990 levels.
- A minimum target of 10% for the use of biofuels by 2020.
- Energy supply and generation activities of energy companies should be 'unbundled' from their distribution networks to further increase market competition.
- Improving energy relations with the EU's neighbors, including Russia.
- The development of a European Strategic Energy Technology Plan to develop technologies in areas including renewable energy, energy conservation, low-energy buildings, 4th generation nuclear power, clean coal and carbon capture.
- Developing and promoting low- or even zero-emitting technologies, including carbon capture and storage.
- Integrating better the EU energy markets through moving towards more competitive, Europe-wide electricity and gas markets;
- Integrating EU energy policy with other policies, including environment, research, agriculture and trade.
- Increasing international cooperation concerning low carbon energy policy. If the EU can take a common approach on energy, and articulate it with a common voice, it can lead global debate.

The Package is expected to provide major contribution to combating climate change as well as providing an example to rest of the world while shaping a new global climate agreement. The measures of the Package are stimulated for more secure energy supplies. In this respect,

[369] Council of the European Union, Council Adopts Climate-Energy Legislative Package, Brussels, 6 April 2009.

oil and gas imports are expected to decrease by € 50 billion in 2020. The measures are also expected to create competitive advantage through significant innovation in the European energy sector while providing more jobs in environment-related industries. Hence, 1 million jobs are to be created in European renewables industry by 2020.[370]

6.4.2. Main Challenges of European Climate Policy in Post-2012 in the Way to Sustainability

6.4.2.1. EU Leadership in the Absence of US and Global Efforts

The EU has firmly asserted the sustainable development, environmental protection and combat against climate change in different international platforms. The EU has been playing a significant global role in several multilateral climate negotiations. The EU is considered generally as one of the most important and leading actors in promoting sustainable development and environmental policies, especially climate change. The EU has a *sui generis* character in world politics as an actor. Since the EU involved strongly in shaping global environmental regimes while affecting conceptual basis of the key environmental principles and worldwide implementation, it has been considered as a normative global power.

The issue of global climate change is closely linked with unsustainable development patterns, so that the EU is very much involved in that issue. On the other hand, absence of the US in the Kyoto regime let the EU to have a more sphere for a leading role in shaping the international climate change negotiations. Indeed, the significant role of the EU in the climate change regime is regarded as evidence of its global leadership efforts since 1980s.[371] On the other hand, the US is still the most significant and important actor on the climate change issue since it is the largest contributor of the GHG emissions and one of the leaders in technological innovations and scientific research.

Despite the efforts of the international actors and the EU, the US preferred not to have any commitments under the Kyoto Protocol. Consequently, the US has been considered as the traditional global leader and standard setter in environmental negotiations, while the EU has

[370] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, "*20-20 by 2020 Europe's Climate Change Opportunity"*, COM(2008) 30, Brussels, 23.1.2008. Available at: http://ec.europa.eu/climateaction/docs/climate-energy_summary_en.pdf

[371] Charlotte Bretherton and John Vogler, "*The European Union as a Global Actor"*, *op.cit*. pp.32-38.

gradually emerged as a policy shaper and a normative global actor particularly in global climate change issue. In the last decades, the main global powers, namely the US, Russia and China, did not seem willing to push further the environmental and climate considerations since they have been focusing more on economic growth and prosperity. On the other hand, the EU is trying to push the way for a leadership in the issue of climate change while promoting energy security, sustainable development and economic prosperity. Since the late 1990s, the EU tries to go beyond the rhetoric to directional and structural leadership, including an improved way of institutionally dealing with the issue within the EU.

Despite the fact that climate change and energy security are firmly positioned on the political agenda and some initial targets have been agreed within a global framework, we are still far away from a mature political and practical policy, which may deliver timely and appropriate results to turn the tide. This is partly because of the complex nature of climate change and partly because of being still in early stage of the development of effective and efficient instruments in global climate policies. However, it is also due to the complexity of negotiations process and lack of effective international governance and leadership to tackle this kind of multi-dimensional problem. Therefore, it is important to promote activities of increasing awareness of the people.

In 2007, Bali Action Plan started a process to conclude a new international climate agreement for post-2012 period at the UN conference in Copenhagen in December 2009. Following the COP 14 in Poznan in December 2008, the negotiation process has been accelerated. The new climate agreement should set concrete new targets as well measures and actions to reduce GHG emissions. Moreover, it should provide a basis for sustainable development by strengthening ability of countries to adapt to climate change and to improve innovation and economic growth while reducing poverty and providing access to sustainable energy services. Hence, there are high expectations that can only be satisfied by cooperation of all countries.

Nevertheless, so far hardly any agreement is clear. One of the key challenges for negotiations is to ensure adequate and comparable effort from developed countries plus a meaningful contribution from developing countries, supported by developed countries. This issue is the

hardcore precondition of achieving overall environmental effectiveness and addressing competitiveness concerns of countries and companies.[372]

It is essential to ensure genuine global cooperation involving all countries and regions of the world for tackling climate change. In particular, highly efficient energy and other technologies should be deployed in rapidly growing countries like China and India. In this respect, Europe should contribute to climate protection and promote wide use of the already existing instruments for international cooperation, such as Joint Implementation and Clean Development Mechanism, while supporting development of future mechanisms.

The EU warns that ignoring scientific warnings will lead to unprecedented, costly and potentially unmanageable consequences.[373] Accounting for about 10.5% of global emissions, only the EU's efforts will not be enough to mitigate climate change unless further action is taken globally. The EU claims that the new climate regime must involve all big emitters, including, USA, China, India and other large developing countries, which currently do not have reduction targets under Kyoto.

The EU is willing to strengthen cooperation between parties with binding targets and increase incentives for others to take such targets on board. In this respect, the EU calls, 80% to 95% reduction of emissions by 2050 in developed countries; leading to global 50% emission reduction by 2050. Moreover, the EU invites developing countries, especially the economically more advanced ones, to set mission reduction commitments and take appropriate actions that will deliver collectively a deviation of 15-30 % below business as usual in 2020. In this respect, the EU encourages all developing countries to commit adopting low-carbon development strategies by the end of 2011.[374]

The EU argues that binding emission reduction commitments should not be limited to the countries that have targets under the Kyoto Protocol. In this respect, the EU claims that the COP 15 in December 2009 should set emission reduction commitments for at least: all

[372] EC, Commission of the European Communities, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *"Towards a Comprehensive Climate Change Agreement in Copenhagen",* COM/2009/0039, Brussels, 28.1.2009, p.12.
[373] *iIbid* p. 14 -16.
[374] EC, European Commission, "*EU Action Against Global Climate Change. Leading Global Action to 2020 and Beyond*", Brussels, 2009, p.9.

countries listed in Annex I to the UNFCCC; all OECD member countries and all current EU Member States, EU candidate countries and potential candidates.[375]

6.4.2.2. EU Enlargement and Europeanization

The EU is integrating and expanding. The member states are subject to comply with the set of legislation and institutional order. Environmental policies of the EU are on way to Europeanization, hence environmental and sustainability concerns of the EU and the Europeans have been a tool for "Europeanization" both internally for the Europeans and the externally for the others. The leadership of the EU in combat against global climate change is encouraged by the public support. According to the last survey, protecting the environment is important to 96% of the Europeans and they are very much concerned about issues such as climate change and pollution.[376]

Environment is the most well developed areas of competence of the EU. Most of the early measures of 1970s have been linked to the goal of creating an internal market for goods. However, environmental policy has been released from legal and political constraints of the internal market. The environmental policy started to encompass areas that had not been comprehensively regulated at the national level, such as access to environmental information, protection of natural habitants and system of environmental impact assessment. Therefore, it is claimed that national systems have been Europeanized by involvement in the EU policy making.

Despite its weaknesses, EU environmental policy arrangements and institutions are more developed than supranational policy and institutions as well as multilateral environmental agreements. This is maybe due to better developed and planned integration at the EU level. Moreover, it is because of the fact that developed and less developed countries do not have the same priority concerning environmental considerations, due to the large economic differences.

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[375] EC, Commission of the European Communities, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, *"Towards a Comprehensive Climate Change Agreement in Copenhagen",* COM/2009/0039, Brussels, 28.1.2009

[376] Special Eurobarometer 295 (2008) Attitudes of European Citizens Towards The Environment. Available at: http://ec.europa.eu/public_opinion/archives/ebs/ebs_295_en.pdf

The EU's climate change policy aims successful transition to a low carbon economy through measures to mitigate emissions and adaptation to ongoing climate change. The EU measures, which aim emissions reductions in line with its climate change strategy, are not enough to achieve ambitious targets. In addition to new measures and policies, the existing policies and tools should be reviewed in order to eliminate their adverse effects and to maximize benefits from different policies. For instance, EU funding actually contributes to a large increase in GHG emissions especially concerning the investments at motorways. Particularly emissions in Greece, Portugal, Ireland and Spain increased considerably since they have been receiving EU funding. Consequently, the EU should review and change its funding priorities and policies in a more sustainable and climate friendly path. Moreover, Community-wide environmental tax policy is not a success policy, since the Member States are reluctant to yield sovereignty to the EU in tax matters. Although there is reluctance for adoption of the eco-taxes at Union level, market-based instruments constitute an important element of EU Environmental Strategy.[377]

6.4.2.3. Energy and Climate Policy in Market Competition

The European Union faces major challenges in its climate policy, which is integrated to energy policy. The first challenge is the EU's commitment to reduce GHG emissions in the context of the international agreement on climate change. The second challenge is ensuring European security of energy supply while its dependency on external sources of energy increases constantly. In addition, these challenges are to be tackled simultaneously, in the conjecture that the world faces one of the biggest economic crisis, the EUs markets of electricity and natural gas are being liberalized and facing political challenges due to the accession of new Member States. Also we should take into account the fact that political stability in major energy-producing countries in the world is fragile and insecure.[378]

Energy import dependency level of the EU is likely to rise to about 70% in 2030, comparing to 50% dependency today. Hence Europe faces twin-challenges of climate change and energy supply security, which requires ensuring energy security in a competitive and liberal market

[377] EEA, European Environment Agency, *"Annual European Community Greenhouse Gas Inventory 1990–2007 and Inventory Report 2009 Submission to the UNFCCC Secretariat Version*", Technical report No 4, Copenhagen, 2009.
[378] Onno Kuik, "Climate Change Policies, Energy Security and Carbon Dependency Trade-offs for the European Union in the Longer Term, in International Environmental Agreements: Politics", *Law and Economics*, No.3, Kluwer Academic Publishers, Netherlands, 2003, pp: 221–242.

while addressing environmental impact of energy production with the vision of sustainable development.[379]

Energy supply security, environmental sustainability and competitiveness are central objectives of the EU energy policy. Energy security depends on several factors including, access to energy resources at competitive prices, possibility to invest in exploitation and supply infrastructures, elimination of policies, restricting exports and other measures that penalize European companies, development of public-private partnerships for cross-border energy infrastructures in broader regions where there is an element of risk. Therefore, the diversification of energy sources, increased investment and technological innovation are vital for energy security.

Through the Energy and Climate Package, the EU aims to reduce 20% in CO2 emissions from all primary energy sources by 2020, compared to 1990 levels, while pushing for an international agreement achieving a 30% cut by all developed nations by 2020. The Package seeks to increase use of renewables to 20% of total energy production, which is currently 8.5%. Also it aims to cut energy consumption by 20% of projected 2020 levels - by improving energy efficiency. In addition, substituting renewables for non renewables in electricity production, transport and the heating/cooling of buildings would contribute decreasing imports dependency and consumption of fossil fuels and reduction of polluting emissions.[380] The 20% target for renewable energy is very eager comparing to the current 8.5% share of renewables in the EU. Realization of this target requires massive build-out of the current infrastructure and development of new technologies. Furthermore, there is a need to move towards further harmonization of the existing national support schemes for the use of renewables in the production of electricity in order to achieve the target cost-efficiently.

The EU policy aims to integrate environmental concerns within the energy sector by reducing environmental impact of energy production and use; promoting energy savings and energy efficiency as well as increasing the use of cleaner energy and its share of total production. In order to realize the ambitious energy and climate change policy, while safe-guarding business competitiveness, the EU needs to develop a strategic plan. While doing this the EU should

[379] EEA, European Environment Agency Report, "*Energy and Environment in the European Union: Tracking Progress Towards Integration"*, *op.cit,* p.19.
[380] Council of the European Union, "*Council Adopts Climate-Energy Legislative Package"*, Brussels, 6 April 2009.

refrain from an energy and climate policy, which would damage European industry competitiveness in the future.[381]

It is widely acknowledged that unilateral European efforts will be ineffective, unless comparable efforts are made by other industrialized and developing countries. The ambitious environmental targets of EU energy and climate package have a risk to cause negative effects on the competitiveness of industry and on employment if the EU is left alone in the issue.

In this respect, it is important to strengthen international partnerships with key producing and transit countries while promoting relations with major consumers to ensure open and competitive global energy markets, energy efficiency and regulatory cooperation. Economic and regulatory initiatives within the EU should be complemented by an active external policy in the area of energy. Through strengthening bilateral and multilateral relations with energy-producing and energy-consuming countries, the EU may tackle the key challenges for energy security and for access to supplies at stable, competitive prices.

Promoting international cooperation on energy efficiency may serve to security of supply, pricing and environmental objectives. However, there are two immediate external energy challenges for the EU. The first one is to respond to the geopolitical realities of oil and the second is the risk of a gas shortage over the medium term. In this respect, transatlantic cooperation is important for reaching a common understanding on key energy policies, including environmental protection, energy efficiency and technology policies. As major consumers of energy and important international actors, the EU and the US would promote more market-based approaches for the development, extraction and trade of key energy commodities, such as oil and gas, while endorsing environmental protection.[382]

Another important actor in the energy sector is Russia that will remain the EU's most important gas partner for the coming years. The EU and Russia would enjoy mutual economic benefits from cooperation on energy and other economic issues. Therefore, the EU and Russia should improve their relations on the basis of equality, mutual understanding and reciprocity

[381] UNICE, Comments on the Commission's Green Paper on Energy Efficiency, "*Doing More with Less*", COM 2005-265), Brussels, November 2005.
[382] Daniel Yergin, "Ensuring Energy Security", *Foreign Affairs*, Vol. 85, No. 2, 2006.

by negotiating a mutually beneficial strategic partnership covering energy, environment, investment, trade and cooperation on regulatory and technology policies.[383]

Besides improving the international partnerships, the EU should improve, both between the Member states and within the Commission, the coordination of external trade, development, and diplomatic policies, which can contribute to an EU-level external energy and climate policy. As the leading global trader in goods and services, the EU is the biggest provider of development assistance (55% of world total) so it plays a vital diplomatic and stabilizing role in international politics. Greater efforts should be made to leverage these policy instruments to secure more access to competitively priced energy imports.[384]

It is important to implement policies and measures for improvement of energy efficiency aiming significant reductions in the energy intensity of end-use sectors. The main policies include a directive on energy end-use efficiency and energy services, standards and labels on a number of products as well as a directive on eco-design of energy-using products. Energy efficiency standards in the transport sector and also for buildings have also been tightened. However, the effects and results of these improved standards would be seen in the longer term. These efforts would be more meaningful if the other developed and also developing countries would follow the same way. [385]

Moreover, public awareness in international and national levels is important. Regulations on energy efficiency and technological efficiency improvements should be complemented by the changes in consumer behavior. In this framework, change in consumer behavior might be promoted through provision of information by labeling of products, awareness-raising campaigns and incentives for environmentally-friendly behavior. Since 1994, the EU applies mandatory energy consumption labeling for a range of household appliances to help consumers to identify the most energy-efficient models in a range of products. Hence, new and cleaner technologies are important for reducing the impact of energy use on the

[383] Gareth Winrow, "Turkey and the East-West Gas Transportation Corridor", *Turkish Studies*, Summer, Volume 5, Number 2, 2004, pp.33-35.
[384] "Avrupa Birligi'nin Enerji Politikası, 15 Soruda 15 AB Politikası", Iktisadi Kalkınma Vakfı. Istanbul, Number 13, 2003, pp. 1-28.
[385] EC, European Commission, *"2008 Environment Policy Review",* 2009, Brussels.

environment. Substantially increased use of renewables and energy efficiency technologies are a key part of a long-term sustainable and competitive energy system.[386]

The EU aims to ensure competitiveness while deploying integrated energy and climate policy and involving enhanced cooperation of all countries. In order to achieve this, the EU needs to strengthen its capacity through new adaptation measures while creating a low-carbon and resource-efficient economy for the EU. In this respect, the current economic crisis presents a historic opportunity to speed up the greening of our economies so that government should invest in environmental infrastructure, energy and resource efficiency and eco-innovation.[387]

[386] EC, European Commission, "*Reducing Emissions from the Energy and Transport Sectors. EU Action Against Climate Change", op.cit*. p.11
[387] European Commission, "*2008 Environment Policy Review*", *op.cit*, p.24

VI. SUSTAINABLE DEVELOPMENT AND CLIMATE CHANGE POLICIES IN TURKEY AS AN ACCESSING COUNTRY TO THE EU

7.1. Environmentalism and Sustainable Development in Turkey

As an OECD member, as a country in EU accession process and as a developing economy, Turkey has kept environmental concerns far from the top national priority list. Environmental issues have been located as a sub category under the more dominant spheres of economic, politic and social problems. Despite the fact that Turkey has considerable environmental legislation and environmental concerns have been taking place in the five-year development plans since 1973, very little action is taken towards sustainable development and environmentally friendly lifestyle. Although several attempts have been taken to improve the legislation in transition towards sustainable development, the scope and intensity of environmental problems in Turkey are worsening.

In the recent decades, public concerns about global and national environmental problems have increased considerably in Turkey since growing burden of economic development on the environment is acknowledged. Besides the growing environmental problems and international pressure, the role of the media and civil society organizations can not be denied in this respect. Since the early 1990s environmental politics in Turkey developed rapidly in line with the demands of civil society and various international actors. Moreover, the EU accession process has played an important role leading Turkey to start to make legal arrangements in its environmental law in the process of harmonization of environmental law and policies with EU environmental Acquis. However, Turkey's actions and policies in sustainable development, environment and climate change can not be explained only by the objective of becoming an EU member.

Turkey started to alignment to the EU environmental Acquis upon the declaration of "a candidate country for EU membership" status for Turkey by the European Council in December 1999 and commencement of accession negotiations in 2004. The screening process for the Chapter on Environment was completed in June 2006. Concerning the environmental policies and combat against climate change, Turkey stands at the cross-roads. While Turkey still tries to stick with environment versus development dilemma, it is forced to make immense changes in legislation and in implementation of environmental policy during the EU

accession negotiations. Since targets and goals of EU Environmental Acquis constantly develop in order to meet better standards, Turkey faces challenge to meet this "moving target" during the long-standing EU accession process.

Despite considerable progress for decades, we can not say that Turkey was able to develop a comprehensive, consistent and efficient environmental policy. This is mainly due to traditional tendency to define development only in terms of economic growth while treating environment as a secondary issue, after economic and national security policies. The dilemma between the protection of environment and economic growth has dominated to Turkish politics as in most of the developing countries.

Although, the Stockholm Conference and its successors, such as the Rio and Johannesburg Summits, presented environment as a precondition for economic development, Turkish policies generally perceived economic growth as a precondition of a sound environment. This approach is in parallel with the weak version of sustainable development, which claims that environmental deficiencies could be fixed through technological means.

Economic development and environmental protection are still perceived as mutually-exclusive and contradictory. Moreover, Turkey's environmental policy generally offers ad hoc remedies for environmental problems rather than preventive ones, so that is basically curative in quality. The environmental policy of Turkey has been formed within the framework of "polluter pays principle", which favors punishing the polluter when and where the pollution has occurred, but does not quest for precautionary or preventive solutions.[388]

The most of the environmental problems in Turkey are mainly caused by the fact that it has been developing for many decades. In order to tackle underdevelopment, the governments supported rapid industrialization, which in turn paved the way for unregulated urbanization and environmental problems in Turkey. Concentration of the industrial sector in specific cities also resulted in internal migration, which in turn deteriorated the effect of industrialization. The industry on the other hand, perceived environmental regulations as a drawback for economic growth and industrialization.

[388] Semra Cerit Mazlum, "Süreklilik ve Degisimler Ekseninde Çevre Politikası", *Kamu Politikaları,* Dr. Hüseyin Erkul, Levent Gökdemir (eds.), Detay Yayınları, 2007, p. 233.

The Environmental Law, which was amended in 2006, states its objective as "ensuring the protection of the environment, which is the common asset of all living creatures, in line with the principles of sustainable environment and sustainable development".[389] In this definition, the use of the concept "sustainable environment" together with "sustainable development" shows that the term sustainable development is perceived only in economic terms.

The tendency to define development purely in economic terms while considering environmental protection as an obstacle to industrialization has been the main reason of fail of Turkey to have comprehensive, consistent and efficient sustainable development policy, which integrates environment into sectoral policies. In Turkey, generally ad hoc solutions have been found to environmental problems not only due to the above mentioned tendency but also due to the problems of coordination among the institutions. Therefore, problem of coordination and institutionalization coupled with lack of systematic approach hindered handling Turkey's environmental policies in sustainable thinking.

Since Turkey ratified the UNFCCC and the Kyoto Protocol considerably later than the other countries, the institutional mechanisms are yet in the process of formation. In addition, there are limited numbers of studies on effects of climate change and adaptation policies as well as assessments for the means of mitigation in Turkey. Although bureaucrats, experts and even some politicians draw attention to threat of climate change and call for action, they don't accept national responsibility of Turkey as compared to industrial countries. Hence, they don't favor strict measures, which might end up with consequences limiting economic development of the nation.

In Turkey, as in other developing countries, industrial pollution control is often seen as a trade-off between clean environment and economy in terms of employment, energy supply and production. As a result, enterprises are allowed to continue polluting in order not to compromise economic gains. In the recent years, however, there is greater recognition of linkages between pollution from industry and public health problems and eco-system degradation-such as increased pulmonary disease incidence in areas surrounding thermal power plants and death of aquatic life in rivers running near industrial areas. As in Europe and

[389] *Ibid,* p. 231.

America in the past decades, demand for more effective environmental management grow as the economy continues to grow.

7.2. Evolution of Policies of Sustainable Development and Environmental Protection in Turkey

Similar to the international process, environment started to take place in the agenda of Turkish politics in the 1970's. Turkish environmental policies are based on the belief that environmental problems occur due to inadequate per capita income distribution and inefficient use of natural resources hence environmental policies sould not hamper industrialization and economic growth.[390]

In parallel with the international trends concerning sustainable development and environmental protection, Turkey historically revises and renews its environmental policies and institutional structure. The attempts to achieve sustainability in Turkey run in line with the Stockholm Conference and the Johannesburg Summit. For instance, after the Stockholm Conference, Turkey founded the Undersecretary of Environment and put into effect the Environmental Law no. 2873.[391] However, the law had curative approach, rather than preventive in quality, except for the section of "environmental impact assessment".[392] Moreover, the Ministry of Environment was established in time of the Rio Conference.

Following the Johannesburg Summit, as other countries, Turkey needed to meet the requirement of reflecting public opinion in national sustainable development policies and forming these policies in a way to direct government policies.[393] For this purpose, the government formed the Commission on National Sustainable Development, which was composed of the representatives of the Ministries of Internal and Foreign Affairs, Environment and Forestry and the State Planning Agency. By excluding other related institutions and civil society, this composition was not in conformity with the requirement of Agenda 21 of reflecting public opinion.

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[390] Aysegül Mengi and Nesrin Algan, "*Küreselleşme ve Yerelleşme Çagında Bölgesel Sürdürülebilir Gelişme: AB ve Türkiye Örnegi"*, Siyasal Kitabevi, Ankara, 2003, p 228. See also Keles, Rusen and Can Hamamcı, *Çevrebilim*, Ankara: Imge Kitabevi, 1997, p.250.

[391] Nuran Talu, "*Integration of Sustainable Development into Sectoral Policies- Stocktaking Analysis",* 2007, p.52

[392] Rusen Keles, "Çevre ve Siyaset", in I*nsan, Çevre, Toplum*, Rusen Keles (ed.), Ankara: Imge Kitabevi, 1992, p.178

[393] Semra Cerit Mazlum, Semra, "*Süreklilik ve Degisimler Ekseninde Çevre Politikası*", *op.cit.* p.244

Although, previous environmental policies focused generally on resource conservation and human health issues, the environment is started to be considered as a sector on its own for the first time in Turkey in the first half of the 1970's. Five Year Development Plans (FYDP)[394] of the State Planning Organization (SPO) provides essential grounds for the environmental policy of Turkey. The progress of sustainable development policies of Turkey can be observed through its development plans. In this respect, the 3rd Five Year Development Plan (FYDP), which defined environment as a specific sector, determined the principles, objectives and aims as well as the general framework of the environmental policy of Turkey, which still preserves its validity to a large extent today.[395] Although the Plan had a sub category of 'environmental' heading; the fundamental approach refrained from adopting policies that would deter development and industrialization of the country. The 4th FYDP (1979-1983) encouraged preventive environmental policies in an attitude to consider environment within the processes of industrialization, modernization in agriculture and urbanization.[396]

The Brundthland Report, namely "Our Common Future" Report is also observable in Turkey's environmental policies especially beginning from the 5th FYDP which, put main objective as eliminating the existing pollution or preventing the possible pollution, while protecting and developing resources for the use of future generations. Hence, the 5th FYDP introduced preventive measures and policies.[397]

The Constitution of Turkey, which was adopted in 1982 after the coup detat of 1980, states in Article 56 that "improvement of the environment, protection of environmental health and prevention of environmental pollution is the duty of the state and the citizens." Following the Constitution, the Environmental Law was introduced in 1983. Nevertheless, the environment could be held within ministerial level only by 1991 after the establishment of the Ministry of Environment, which was transformed into the Ministry of Environment and Forestry in 2004 by a new regulation.

[394] The Under-Secretariat of the State Planning Organization (SPO) attached to the Prime Ministry prepares five-year national development plans, annual programmes and annual investment plans. The development planning in Turkey starts with the establishment of SPO in 1960, and with the 1st Five-Year National Plan in 1963.
[395] Semra Cerit Mazlum, "*Süreklilik ve Degisimler Ekseninde Çevre Politikası*", *op.cit.*, pp.219-255.
[396] Aysegül Mengi and Nesrin Algan, "*Küresellesme ve Yerellesme Çagında Bölgesel Sürdürülebilir Gelisme: AB ve Türkiye Örneği", p.228.*
[397] *ibid* p. *229.*

The concept of sustainable development could take place finally in the 6th FYDP (1990-1994), which defined sustainable development as a policy objective. The Plan mentioned about "Sustainable Development" with particular emphasis on "the needs of next generations". With this plan environment began to be integrated into state policies concerning economic sectors. Having been published in the process of the Rio Conference, this Plan indicated that the relationship between continuous economic growth and protection of environmental resources are started to be considered in Turkey. Meanwhile, the Commission of Environment worked to make the necessary legal arrangements in order to place the sustainable development policies of the Agenda 21 into the environmental Law, while supporting the Turkish Grand National Assembly (TBMM / TGNA) to ratify the UN agreements, which were prepared during the Rio Conference.[398] Following the Rio Summit, environmental issues and policies started to take more place in the public and politic agenda of Turkey.

The 7th FYDP (1996-2000) adopted sustainable development as the basic principle and approached to the issue of environment as "a matter of management". Within this Plan, sustainable development became a fundamental strategy. Meanwhile, with the participation of not only the experts or governmental agencies, but also the representatives of civil society organizations, scientific institutions and the private sector, Turkey prepared the National Environmental Strategy and Action Plan (NEAP)[399], which was financed by the World Bank. As a significant step towards sustainable development, this plan aims to determine priority areas of environmental policies and management options as well as resolution plans for the complete structural change concerning environmental policies. Hence the NEAP suggested actions in order to harmonize development and environmental policies in several fields and sectors. The NEAP had four priority areas including better quality of life, increased environmental awareness, improved environmental management and sustainable economic, social and cultural development. Although, the Plan pointed out to realistic policies and needs for implementation, it was not legally binding.[400]

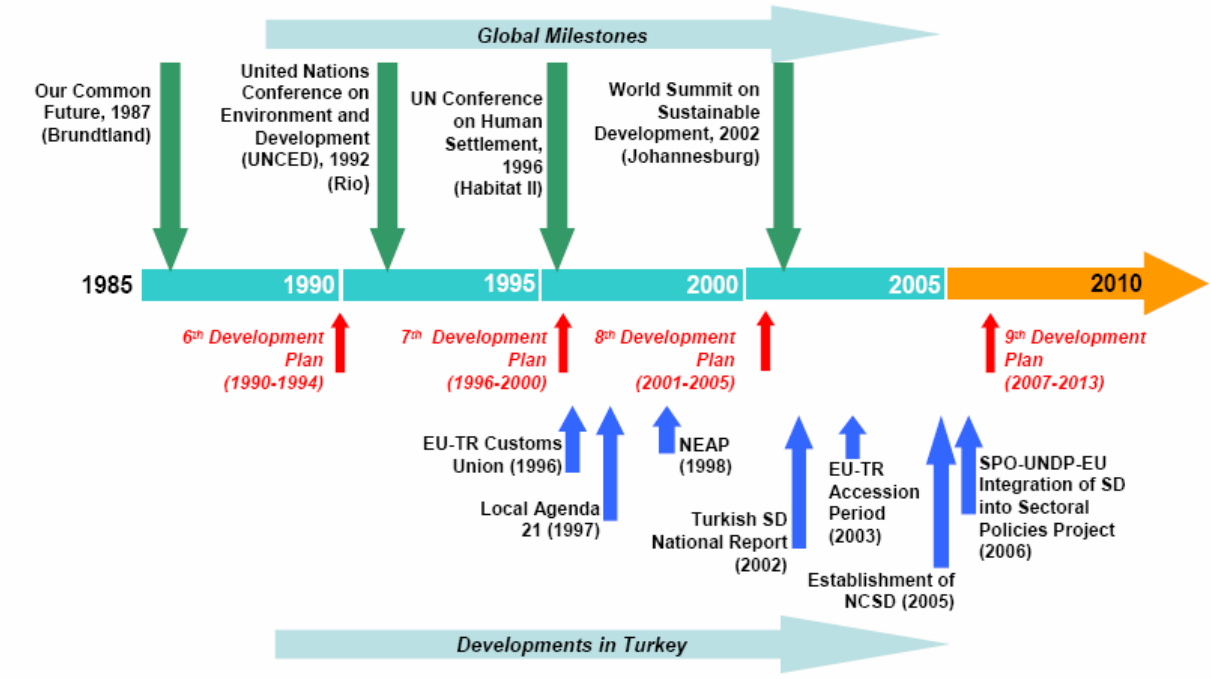
The 8th Five Year Development Plan (2001-2005) stated that "economic and social development shall include environmental protection". Within the 8th FYDP, environmental protection has been linked with competitiveness while strategic planning and performance

[398] Nuran Talu, *"TBMM'de Çevre Siyaseti"*, Nobel Yayın Dağıtım, Ankara, 2004, p.155.
[399] National Environment Action Plan of Turkey (NEAP), 1999.
[400] Nuran Talu, "*Integration of Sustainable Development into Sectoral Policies – Stocktaking Analys*is", *op.cit.* p.19

based budgeting are initiated towards institutional sustainability. Finally, the 9th Development Plan (2007-2013) set a vision as "Turkey, a country of information society, growing in stability, sharing more equitably, globally competitive and fully completed her coherence with the European Union".[401]

Being adopted in 1983, the Law of Environment was amended in 2006. It provides an overall framework for environmental management in Turkey with comprehensive 1724 pages document, covering a vast range of environmental issues. These are broad and detailed legislations, stating clearly defined quality indicators and baselines for a vast array of environmental outcomes.[402] The revised Environment Law introduces new tendencies such as anticipatory pollution prevention, eliminating pollution at its source rather than further downstream, achieving energy efficiency, and creating a polluter-pays system.

Figure 7. 1 Global & National Evolution of Sustainable Development in Turkey



[401] DPT (SPO), State Planning Organization, "*The 9th Development Plan 2007-2013*", Ankara, p.11. Available at: http://ekutup.dpt.gov.tr/plan/ix/9developmentplan.pdf

[402] Adaman, Fikret and Arsel, Murat, "*Economy, Society and the Environment in Turkey: The Triple transformation of the Strong State"*.

7.3. Climate Change Negotiations and Position of Turkey

7.3.1. Affects of Climate Change to Turkey

As one of the biggest global challenges of our age, the climate change will have different effects in different regions. It is predicted that climate change will affect the Mediterranean Region dramatically, so that Turkey confronts great risks. The most striking effects of climate change on Turkey are expected to be water scarcity, deforestation, desertification, droughts and ecological degradation related to these developments. Hence, Turkey is considered within the risky group of countries, which are vulnerable to the potential effects of the climate change. In this respect, tourism and agriculture are the main sectors that will be affected primarily by climate change in Turkey.[403]

Due to climate change, a widespread increase in summer temperatures is expected, particularly in the western and south-western parts of the country. Accordingly, significant decrease in winter precipitation have been observed in the western provinces in the last decades. In 2006 and 2007, Turkey has experienced one of the driest and hottest winter seasons while facing severe floods, which resulted in 40 casualties across the southeastern region.[404]

The incremental increase in average temperatures cause first of all dramatic water shortages in the major cities as well as the agricultural areas. Despite the fact that Turkey has rich water resources, these are unevenly distributed throughout the country. Since the average water share is 1430 m3/person, Turkey is classified as water scarce or water stressed country. Water scarcity, which leads to deforestation and desertification, constitutes a major challenge for the agricultural production even resulting in change of countries' product design. As the most important agricultural basins, Konya and Cukurova have already been affected negatively. Production of major crops in the basin decreases due to increase of CO2 concentration,

[403] MoEF, Ministry of Environment and Forestry, "*First National Communication on Climate Change, Republic of Turkey"*, Ankara, January 2007.
[404] These extreme climate events as well as the last report of the Intergovernmental Panel on Climate Change, IPCC, accelerated discussions and raised public awareness on global warming at national level. In this respect, Turkey had been under increasing internal and international pressure to sign the Kyoto Protocol and it finally signed the Protocol in 2009.

temperature and water stress.[405] Consequently, water scarcity may lead to food scarcity and poverty that create pressure for migration, which in turn cause social unrest and further undermine social stability of the country. Migration due to the water scarcity is not only a domestic but also an international threat for Turkey, since most of Turkey's southern neighbors face already water scarcity.

Air pollution has been a serious problem leading relatively high social and economic costs in Turkey. The latest OECD environmental performance review estimated that excessive SO2 emissions in the early 1990s might have increased mortality by over 3000 deaths and restricted activity days by almost 7 million each year.[406]

7.3.2. A Long Path: Turkey's Ratification of UNFCCC

Potential human-induced changes in climate have been observed in global and local levels in the last decades. The increasing effects of climate change threaten the future generations. Consequences of human activities on climate have been recognized in the early 1980s and the first common action plans started to be formalized under the umbrella of the UN. During the last decades, the issue of climate change did not attract desired attention in Turkey. Therefore, the level of public awareness as well as the number of scientific researches on this issue has been relatively restricted in Turkey.

Turkey has participated at the 2nd World Climate Change Conference in 1990 and the Ministerial Declaration, in addition voted for the General Assembly resolutions in early 1990s, and participated at the meetings of the Intergovernmental Negotiating Committee (INC). Hence we can say that Turkey has been involved in early stages of global efforts on climate change. Nevertheless, in the early steps of the UNFCCC, Turkey could not recognize that the climate change policies was evolving from a purely scientific basis to a more

[405] In Turkey 72% of water is used in the sector of agriculture in inefficient traditional ways. Water efficient sprinkling and drip irrigation technologies are used only 6% of the total irrigation area, while in the majority of fields (94 %) inefficient and highly water consuming surface irrigation methods are applied. The cost of droughts in 2008 for the agricultural sector amounts to 1.5-2 billion € approximately, with 435,000 farmers being affected severely. Major production losses in cereals and lentil production has been challenging.

[406] Ministry of Environment and Forestry (MEF), "*First national Communication of Turkey on Climate Change*", Ankara, Turkey, 2007, pp. 60–150. See also Greenhouse Gas Mitigation in Energy Sector for Turkey, Working Group Report, MENR, Ankara, Turkey, 2005. Turkey Energy and Environmental Review, Task 7: Energy Sector Modeling, Prepared by G. Conzelman and V. Koritarov, Center for Energy, Environmental, and Economic Systems Analysis (CEEESA), Argonne National Laboratory, August 2002.

technical, economical and political issue. Hence, Turkey did not participate actively in initiation of the UNFCCC and Kyoto Protocol with detailed scientific researches, appropriate policies, which promote the balance between environment and industry. Turkey was represented in the 12 Intergovernmental Negotiating Committee meetings with an average size of 2 delegates between the years 1991 and 1995.[407]

The UNFCCC has been opened to signature during the UN Environment and Development Conference (Earth Summit) in 1992 in Rio. Since OECD membership has been chosen to be the criteria, Turkey was placed in the Annex I[408] to the Convention together with the industrialized OECD countries and Economies-in Transition and also in Annex II[409] list.

Since Turkey did not closely monitor the progress at the international level and could not estimate the outcomes of the process, it could not position itself in line with its level of emissions and economic development. Turkey was not active during the preparation of the Draft Framework Convention on Climate Change between 1988 and 1992. Consequently, in 1992, Turkey, as a member of the OECD, was included among the countries of the UNFCCC's Annex I and Annex II, although the degree of industrialization was not yet comparable with OECD countries. Hence, Turkey declared that it would not be Party to the UNFCCC as long as its name is not deleted from both Annexes.

Turkey officially opposed in October 1992 to its placement in the Annexes and claimed its position was more like to those of non-Annex I countries in respect to development and emissions patterns.[410] In the official declaration, Turkey stressed that it has agreed with the objectives of the UNFCCC, that the GHG concentrations in the atmosphere should be stabilized. On the other hand, it also declared that it could only "bear the burden of reducing emissions in a way that reflects its own level of development" which has already been emphasized by the UNFCCC under its "common but differentiated responsibilities".[411]

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[407] REC Turkey, "*Efforts of Turkey for Reduction of Emissions of Greenhouse Gases in 1990-2004*". Available at: www.rec.org.tr/files/iklim/LIFE_FINAL.../TR_GHGReport.pdf

[408] Annex I to the UNFCCC consists of the OECD countries and the Economies-in-Transition. They have unbinding commitments of reducing their GHG emissions to 1990 levels as of 2000.

[409] Only the OECD countries are included in Annex 2. They have unbinding financial and technical commitments to support the GHG reduction policies in the developing countries.

[410] Turkey's official opposition document to its placement in both Annexes can be found in INC/FCCC Secretariat Document No. A/AC.237/18, Part II, paragraph 35, dated 16 October 1992..

[411] World Bank; Europe & Central Asia Region, Energy Sector Unit; Energy, Mining & Telecommunications Department & Environment Department, "*Turkey Energy and Environment Issues and Options Paper",* World Bank Publication. November 29, 1999, p.55.

The Climate Change Coordination Group, which was formed under the General Directorate of State Meteorology Services, prepared "Protection of Atmosphere and Climate Change" and "Energy and Technology" in 1992 and released the "National Climate Program" in 1993. These reports assessed that countries should contribute in the climate change process according to their level of industrialization and their development goals. The reports claimed that the level of national energy consumption is limited in Turkey comparing to the industrialized countries.

During the COP 1 in 1995, Turkey repeated its request to be deleted from both Annexes by not asking any exemptions, but rather the amendment of its place under the Convention from developed to developing country.[412] Meanwhile, the international community continued the efforts for setting firmer agreement on global climate change policy. Therefore, Turkey could not take an active part during formation of the Kyoto Protocol when it was accepted in 1997, since Turkey was not a member of the UNFCCC by that time. In principle Turkey supported the ideals of the Kyoto Protocol, but Turkey was hesitant to sign and ratify it until other countries clarify their position. Since Turkey was not a party to the UNFCCC by the time of Kyoto Process, Turkish delegation had an observer role during Conferences of Parties so that Turkey could not involve in this process.

By placing Annex I of the UNFCCC as the Annex B, the Kyoto Protocol brought new and binding commitments for them to achieve 5% reduction of GHG emissions below 1990 levels within the first commitment period of 2008-2012. On the other hand, the Kyoto Protocol did not introduce binding emission reduction commitments for the developing countries.[413] Consequently, if Turkey would become a party to the UNFCCC as an Annex I party and would ratify the Kyoto Protocol, then, it would automatically become an Annex B country under the Kyoto Protocol. Hence, Turkey would negotiate a quantified emission limitation or reduction commitment and come under legally binding obligations to meet its commitments.

[412] Turkey's request submitted to the COP1, in 1995, with number FCCC/CP/1995/Misc.5 can be found at the web: http://unfccc.int/resource/docs/cop1/misc05.pdf.
[413] Under the UNFCCC and the Kyoto Protocol, the developing countries, namely the non-Annex I parties, are able to receive grants and other countries' assistance from the Global Environment Facility (GEF), which is the financial mechanism of UNFCCC. Moreover, the non-Annex I countries benefit from the CDM under the Kyoto Protocol.

Since this was an unacceptable for Turkey in respect to its social and economic development, Turkey did not ratify the Kyoto Protocol by that time.[414]

In order to defend its position at the 3rd Conference of Parties in 1997, Turkey presented Country Report, which is similar to the National Communication and Greenhouse Gas Inventory of the Annex-I Parties. Through this report, Turkey presented statistical data to prove that it was a developing country with respect to its social and economic features as well as the developments in its energy sector.[415] In this report, it is claimed that Turkey should be considered as a developing country according to the criteria of the United Nations, the World Bank, and the Montreal Protocol on Substances that Deplete the Ozone Layer, UNCTAD, GATT and even the OECD.[416] Depending on this report, Azerbaijan and Pakistan submitted officially to the Secretariat the position of Turkey to be excluded from both of Annexes.

> *"Turkey has a long standing demand of deletion of its name from the Annexes, to be able to become a party to the UNFCCC. Turkey is not seeking any exemption from the exercise, on the contrary is willing to be in the system, and is ready to accede to the convention, following the necessary amendments in the Annexes. Turkey's position vis-à-vis the UNFCCC process is that commitments should be based on equity and fairness by dully taking into account the "differentiated responsibilities" and "individual circumstances" of the Parties concerned. The UNFCCC commits the industrialized country Parties (not the developing nations) to take lead in stabilizing greenhouse gas emissions. The stipulation is incorporated into the Convention because of the right to sustain socio-economic development and the acknowledgment of the specific needs and special circumstances of developing countries. Furthermore, Turkey is acknowledged as a developing country in the Montreal (Ozone) Protocol, relying on the fact that the World Bank, OECD and UNDP have classified Turkey as a developing country."*[417]

At COP4, which was held in Buenos Aires in 1998, Turkey presented a National Report on Climate Change in order to support once again its official request to be deleted from the both Annexes. The report indicated the efforts of Turkey until that time and demonstrated its plans

[414] Turkey did not ratify the Kyoto Protocol until 2009, a year after of the commencement of the first phase 2008-2012. Hence, as a late comer Turkey did not have any commitments legally after the ratification of the Protocol.
[415] Turkish Paper No: 1. *Turkey and Greenhouse Gas Emissions submitted by Turkey to the UNFCCC, Conference of the Parties,* 3rd Session, 1-10, 1997, December, Kyoto, p.3-4. Available at: http://unfccc.int/resource/docs/cop3/misc03.pdf
[416] *Ibid,* p 12-13.
[417] See http://unfccc.int/cop3/misc03.htm

for the future to reduce its GHG emissions over a business-as-usual scenario based on energy consumption patterns in 1992.[418] Turkey's request has been discussed at COP5 in Bonn, in 1999, but parties could not reach a consensus so that the decision was deferred to COP6 to be held in 2000 in Hague. Since Turkey's proposal to be excluded from both annexes was not supported by the Parties in 2000, Turkey changed its negotiating strategy to a position that will enable the country to be placed only in Annex-I while recognizing its unique national circumstances.

In 2000 State Planning Organization established a Special Expert Commission on Climate Change and produced a comprehensive document within the scope of the 8th Five Year Development Plan. By being placed in the Five Year Development Plan for the first time, the issue of climate change has become a top level governmental issue in Turkey. Following this recognition, upon the Turkish Prime Ministerial decree in 2001, Coordination Board on Climate Change, which was consisted of high level representatives of relevant governmental institutions, was established. This new organization provided a ground for broader participation and comprehensive approach at the public level.

Finally, in 2001 in COP 7 in Marrakech Turkey was deleted from the list of Annex II of the UNFCCC but remained in the Annex-I upon the Decision 26/CP.7. This decision placed the country in Annex-I in a position that is different from that of other Annex-I parties since the parties are invited to recognize the "special circumstances" of Turkey.[419] Since the unbinding commitment of fixing emissions at their 1990 levels as of 2000 was not valid any more in 2001, Turkey did not have any commitments. Hence Turkey accepted to become an Annex I Party under the UNFCCC with special circumstances. After a negotiation process of a decade, Turkey ratified the UNFCCC on 24th of May 2004 as the 189th country. Besides the climate negotiations, Turkey could not also take place in any efforts at the scientific, technical, administrative, institutional, financial and social level on climate change since it was excluded from the UNFCCC until 2004 due to the country's concern related to its position with respect to the annexes.

[418] As not being a party to the UNFCCC, Turkey was not required to prepare this kind of report.
[419] See http://unfccc.int/resource/docs/cop7/13a04.pdf

7.3.3. Ratification of the Kyoto Protocol and Post-2012 Negotiations

Since Turkey was not very active during the formation of the UNFCCC between 1988 and 1992, the country was not positioned in accordance with its economic and industrial development in the climate regime. Following the adoption of the UNFCCC in 1992, Turkey lost significant time in trying to change it place in the Annexes. In spite of significant efforts, Turkey could not achieve to change the lists so that it could not be listed in non-Annex I as a developing country, but rather stayed in the list of Annex I, while being deleted from Annex-II. However, it can be claimed that once the Convention was signed, things had become much more difficult to change. Changing Annexes is difficult not just because it requires consensus of the parties, but also because accepting demands of one country would give way to the requests of many others, which in turn might water down the whole Convention.

If Turkey would be active in political and diplomatic terms and join the UNFCCC in 1992 after negotiating a right position in non-Annex I, then it would be possible to develop well defined and scientifically justified climate change policies together with the other parties. Moreover, Turkey would have possibility to improve the institutional and legal structure in line with the developments in global climate change policy and to attract clean-investments through the mechanisms of the Kyoto Protocol, as many developing countries have been doing so. In this respect, due to non-participation in the UNFCCC process until 2004, Turkey could not benefit from funds and aids provided by the developed countries to the developing countries. In addition, as a passive member of the global climate regime, Turkey could not develop climate mitigation and adaptation policies so that could not have 'learning by doing' chance so far.

Taking into account all these losses, many people from the academia and the civil society claimed in the last years that Turkey should ratify the Kyoto Protocol in order to take active place within the global climate regime and to be eligible to negotiate its position for the post-2012 period. In this respect, apart from the international pressure, Turkey faced also domestic pressure for ratifying the Kyoto Protocol and being active in climate regime. This domestic pressure has increased due to the existing adverse affects of the climate change and worsening environmental conditions as well as the increasing attention of the international community for the issue. In this respect, after being a party to the UNFCCC in 2004, Turkey started to

consider seriously ratifying the Kyoto Protocol, in a formula that refrain Turkey from binding commitments that would hinder the economic development.

At the COP 11, which took place in 2005 in Montreal, the global discussions started for the post-2012 climate regime. Within COP11/MOP1, three meetings took place; namely, the 11th Conference of the Parties, the 23rd meeting of the Subsidiary Bodies, and 1st Meeting of the Parties (MOP1). All the Parties who have ratified the UNFCCC were eligible to take part in the first two meetings while only parties to the Kyoto Protocol could participate actively in MOP1. Hence as a passive party of the system, Turkey could not take part actively in this process, but attended to the meeting in an observer status.

Indeed, as a party of the UNFCCC since 2004, Turkey started to work to mobilize itself within the global climate regime. In this framework, upon the mobilization of GEF fund[420] in 2005, Turkey started preparation of the Initial National Communication, which led the collection of many official data and information, including inventory of GHGs, publicly available at the national and international level. Moreover, the process of the preparation of the National Communication has lead to many initiatives in research and capacity building at the national level. Turkey submitted the First National Communication to UNFCCC Secretariat in 2007. As a party to the UNFCCC, Turkey has to fulfill new liabilities such as to present national GHG inventories and national declaration reports to the Secretariat regularly, and also actively participate in global efforts.

In 2008 the Turkish Grand National Assembly established the "Research Committee for the Effects of Global Warming and Sustainable Water Resources Management" and invited relevant institutions and organizations to work together on the preparation of an comprehensive report. This initiation provided opportunities for intensive dialogues with the

[420] Global Environment Fund is an independent financial entity established in 1991 under the UN to support those projects which help the protection of the global environment. It is the financial mechanism for three Conventions: Convention on Biodiversity, Convention on Desertification and the UNFCCC. Turkey has signed all of the three Conventions. The budget of GEF is prepared by the contributions from the donor countries, especially the US. The fourth 4-year budget of GEF is around $3.2 billion. The first National Communication of Turkey on climate change has also been financed by GEF. Since Turkey is an OECD country, it is both a donor and an acceptor country. Turkey pays approximately $1.5 million per annum to GEF. Annex I countries are not actually eligible for the GEF funds, nevertheless GEF funds can also be extended to those countries who are eligible for borrowing from the World bank. (See World Bank; Europe & Central Asia Region, Energy Sector Unit; Energy, Mining & Telecommunications Department & Environment Department "*Turkey Energy and Environment Issues and Options Paper",* Washington, D.C., November 29, 1999). Therefore, after becoming an Annex I party to the UNFCCC in 2004, Turkey has been able to utilize GEF funds to which it has itself contributed annual payments since 1994.

civil society and public institutions. The Parliamentary Research Commission and the Environment Commission assisted and supported the relevant efforts of the government. In line with increased capacity and awareness at the national level, Turkey started to have a more active involvement at the international level. All these new developments contributed a more appropriate assessment of Turkey's position with respect to the Kyoto Protocol.

Turkey had also the advisory status during COP12/MOP2 in 2006 in Kenya; COP13/MOP3 in 2007 in Bali and in COP14 /MOP4 in 2007 in Poznan. In Nairobi, Turkey handed in its first GHG emissions inventory to the UNFCCC Secretary. Although Turkey has been represented by a limited number of delegates in the previous COPs, since 2006 Turkey had a wider participation.[421]

In 2007 at the UN General Assembly Turkish Prime Minister Mr. Erdogan declared Turkey is considering accession to the Kyoto Protocol at the highest level. Only 10 months after this Announcement, the governmental decision for Turkey's accession to the Kyoto Protocol was forwarded to the Parliament. In addition to the efforts at the UN level, EU Accession process of Turkey, which was accelerated by that time with the launch of accession negotiation process, brought the climate change issues and policies in the agenda of Turkey.

Table 7. 1 Turkey's position with respect to UNFCCC and Kyoto Protocol, 2008

UNFCCC List	Relevant KP Articles	KP List	Critical Parties to the KP	Critical Non-KP Parties
Annex-II	Article 3.9	Annex-B		USA
Annex-I		Non Annex-B	Belarus *(until entry into force of Dec.10/CMP2)*	Turkey
Non Annex-I	Article.9	Non Annex-B	Cyprus and Malta *(Member of EU as of 2004)* Mexico and S.Korea *(member for OECD since 1994 and 1996)* Argentina *(Announced voluntary targets at COP4)*	Kazakhstan *(Urges to be evaluated as Annex-I in the KP)*

[421] Turkey has been represented by an official group in COPs since 2006. There has been officials from the Ministry of Environment and Forestry, Ministry of Foreign Affairs, Ministry of Energy and Natural Resources, Ministry of Indusrty and Services, Minitry of Agriculture, Ministry of Health, State Planning Organization, General Directorate of Electricity, General Directorate of State Meteorological Affairs. Moreover, non-state organizations such as REC Turkey as well as NGOs, including Turkish Cement Manufacturers' Association (TCMA) and Turkish Industrialists' and Businessmen's Association. Even this small participation from the NGOs is very important since it shows the emerging attention started to be given to climate change in Turkey.

Finally, “Draft Law on the Approval of the Participation of Turkey into Kyoto Protocol under the UNFCCC” was endorsed at the Turkish Grand National Assembly on 5 February 2009 and published in Official Gazette on 17 February 2009.

There are 41 Parties in the Annex I list of the UNFCCC. Except Belarus and Turkey, all the Annex I Parties have been placed in the Annex B list of the Kyoto Protocol. Since these two states did not ratify the UNFCCC, they were not Annex I Parties when the Protocol entered into force in 2005,so that they were not placed in Annex B to the Protocol. In 2006 Belarus ratified the Kyoto Protocol and in 2009 Turkey ratified it but they are both not included in Annex B.

As the last party of the Kyoto Protocol, Turkey does not have any commitment on reduction and limitation of digital GHG emissions at the first commitment phase of the Protocol (2008-2012). In this respect, legally Turkey is not included in Annex B of the Kyoto Protocol, although it is an Annex-I country. Hence, Turkey can be considered as “Non Annex-B Party” which gives Turkey a suis-generis case vis-à-vis the Annex I Parties.

Due to this late ratification, Turkey does not have any obligation, but on the other hand can not benefit from the mechanisms of the Protocol. Hence, Turkey cannot participate in flexible mechanisms, since only non-Annex I Parties can host Clean Development Mechanism (CDM) projects and only Annex B Parties can implement Joint Implementation (JI) and International Emission Trading (IET). Consequently, participation in the Voluntary Carbon Market seems to be the only realistic possibility for Turkey in the period 2008-2012.

7.4. Turkey’s Climate and Energy Polices in the EU Accession Process: Challenges and Opportunities in the Way to Sustainable Development

7.4.1. Environment and Climate Policies in Turkey in the EU Accession Process

The climate change has become a priority area not only for the environmental policy, but also energy, transport, agriculture and foreign policies of the EU, so that expectations from the

accessing and candidate countries are increasing.[422] Besides harmonizing and implementing the whole Acquis, the EU expects from these countries to share the same values with the EU concerning sustainable development and climate change policies, as in many other policies. Moreover, the candidate countries are obliged to ratify all the international agreements to which the EU is a party. In the short term, the EU expects candidates and new member states to expand and strengthen resources allocated to energy efficiency improvements in households and industries as well as removal of institutional barriers for such improvements.

As a leading actor in the climate change negotiations, the EU takes serious measures that are generally involved in the Acquis of the EU. In the process of the EU accession, Turkey has to meet obligations of Environmental Acquis, which also includes climate change. The EU gives utmost attention to environmental protection and combat against climate change in line with the sustainable development. Nevertheless, these issues have been ignored in Turkey due to the dilemma between environment and economic development for many years.

The accession negotiations of Turkey to the EU were launched on October 3, 2005 following the adoption of the Negotiation Framework by the Council of the EU. The launch of negotiations initiated a new stage between the EU and Turkey. During the negotiations, Turkey is expected to adapt to the EU Acquis by harmonizing its rules and procedures with those of the EU. In this framework, environment is one of the most comprehensive chapters, adoption of which is difficult since it is integrated to many other sectors and policies, including energy, agriculture, transport, foreign policy, health, economy and sustainable development.

In addition to this complex structure, Turkey faces considerable financial challenge to harmonize, implement and enforce the EU environment Acquis. "Turkey EU Integrated Environmental Compliance Strategy: 2007-2023" provides a roadmap for harmonization with the EU Environment legislation from 2007 to 2023. Accordingly it is estimated that the cost for compliance with the EU Environment Acquis amounts €14.8 billion to industry and €50 billion to the state.

[422] All the new member states, accessing countries and candidate countries are parties to the Kyoto Protocol (including Turkey through her participation to Protocol in 2009). Among these Kyoto Parties, only Cyprus and Malta are Non- Annex B countries.

The 9th Development Plan (2007-2013) is one of the key documents outlining the main principles for annual budget decisions concerning investments, capacity building and other activities by government agencies in support of environmental management. Environment related investments and budget could have only a small portion in the 9th Development Plan. Turkey's hesitant approach to environmental policies can not be explained only by financial difficulties. This is also related to the institutional structure, lack of political will, level of environmental awareness among politicians, bureaucrats and public. Environment is not a high priority issue in Turkey, which tries to deal generally with "hard-core" problems such as economic underdevelopment, national security, social equality, regional development and terrorism.

Environmental issues and climate change considerations could only take place in the last lines of the priority list of many public documents and strategies for many decades until the last years. For instance, the National Program of Turkey's Undertaking of the EU Acquis, which was declared in 2003, did not cover the issue of climate change in the chapter of environment. Indeed, it mentioned the UNFCCC and Kyoto Protocol as international agreements that the EU has been a party. In this framework, it was underlined that the process of accession to the Convention was continuing and the Protocol would be evaluated in parallel with the special circumstances of the country.[423] Consequently, the National Program of 2003 did not provide a framework for the strategic studies and plans for climate policy of Turkey. However, there was considerable progress in this respect in the National Program of 2008, which planed several steps for climate policy especially to be taken after 2009.

The National Program of 2008 planned implementing regulations on emission trading, monitoring GHG, capacity building and determination of national emission ceilings. Within the framework of Improving Emissions Control Project, the National Program set several measures, including harmonization of the Directive on National Emission Ceilings with the Air Quality legislation; improvement of the national emission inventory and GHG emission projections; preparation of the Regulatory Impact Assessment on implementation of the

[423] The Republic of Turkey, Secretariat General for EU Affairs, ABGS, *"National Program of Turkey's Undertaking of the Acquis of the EU*", 2003, pp. 589-647.

Directive on National Emission Ceilings, building up institutional and technical capacity for transposition of the Directive on National Emission Ceilings (2009-2011).[424]

The Turkish Government issued Turkey's Program for Alignment with the Acquis covering the period between 2007 and 2013. Preparation of such a document was not an obligation under the accession negotiations, but rather an initiative of Turkey in order to accelerate and schedule the reforms for the accession process. This Program contained three preparatory measures that are directly related to climate change and planned to be issued as secondary legislation between the years 2010-2013. The first regulation anticipated the transposition of rules and regulations related to emissions trading. In this respect, it was underlined that appropriate arrangements would be made according to whether Turkey becomes a party to the Kyoto Protocol or not.[425] In the period of 2010-2013, the second regulation was planed to be issued in respect to the transposition of the rules and procedures concerning the monitoring of GHGs. This Regulation was also to be arranged according to Turkey's ratification status of the Kyoto Protocol. The last regulation, which was planned to be issued in the same period, was related to the determination of national emission ceilings in parallel with the efforts to harmonize the Turkish laws and regulations with the EU Acquis.[426]

In 2008, the Accession Partnership Document for Turkey was published. It listed the short-term and medium-term priority lists containing the need for transposition, implementation and enforcement of the Acquis related to the framework legislation concerning the environment chapter as well as international environmental conventions that the EU is a party. In this respect, it has drawn attention to the fact that Turkey should ratify the Kyoto Protocol, during the EU accession process, since accessing countries are obliged to be a party to all international agreements that the EU takes part. Moreover, it emphasized the importance of integration of environmental requirements into other sectoral policies.[427]

Concerning the climate change, the major and foremost demand of the EU was ratification of the Kyoto Protocol by Turkish Government. Screening Report of the European Commission

[424] The Republic of Turkey, Secretariat General for EU Affairs, ABGS, "*National Programme of Turkey for the Adoption of the EU Acquis"*, 2008, pp.289-320.
[425] The Republic of Turkey, Secretariat General for EU Affairs, ABGS, *"Turkey's Program for Alignment with the Acquis (2007-2013)",* 2007, p.350.
[426] *ibid*, p 351.
[427] The Republic of Turkey, Secretariat General for EU Affairs, ABGS, *"Accession Partnership with the Republic of Turkey"*, 2008.

for Turkey in 2008 draw attention to the risk that Turkey might have faced a 'Kyoto criteria' for the opening of negotiations on environment chapter. Finally, Turkey became a party to the Kyoto Protocol in August 2009, but as a late comer Turkey does not have any emission reduction commitment in the first phase of 2008-2012. Turkey's ratification of the Kyoto Protocol is considered as an opportunity to strengthen integration of policies for environmental management and sustainable development into other sectoral development practices. Furthermore, being a Party to the UNFCCC and Kyoto Protocol will enable Turkey to involve more actively in global climate regime and create a substantial input for the ongoing efforts related to the accession to the EU. In addition, the accession negotiations for EU membership could also serve Turkey a policy ground for improvement of climate change policies. In this respect, Turkey needs a comprehensive strategic plan to accomplish the objectives of the global climate regime in line with its goal of sustainable development. For this purpose Turkey should take concrete measures including, increasing energy efficiency in end-use sectors, fuel switching and increasing the use of renewable energy sources, particularly hydro resources. These measures would serve to the harmonization with the EU Environmental Acquis and adaptation to climate change and reducing emissions.

The EU expects the new members and candidates to develop climate strategies in line with the EU policies. In this framework, in January 2006 in Warsaw the Conference was hold on "The Future EU Climate Change Policy: Challenges and Opportunities for the New Member States (NMS), Acceding (AC) and Candidate Countries (CC)". There were three important outputs of this conference for the new EU members, candidates and acceding countries. First of all, it was declared that GHG emission reductions offer opportunities to enhance economic development in a world of increasing energy prices, as well as increasing energy supply and energy security challenges. Through decreased fossil-fuel dependency and greater energy efficiency, countries can have benefits including fuel cost savings, decreased exposure to volatile fossil fuel prices, health related benefits and new employment opportunities. Secondly, the importance of integration of climate change policies into sectoral and regional policies was highlighted. Third, it was recognized that the GHG emissions of the new Member States, Acceding Countries and Candidate Countries were likely to increase in the future in parallel with continuing economic development. Indeed, these countries were invited to develop and evaluate options for a long term climate strategy, which requires economic studies on mitigation potentials and their associated costs and benefits. In this respect, it is also essential to work on capacity building across the country and in the government level.

Strengthening capacity requires employment of more resources and better using of existing resources and knowledge.[428]

The candidate and accessing countries to the EU are expected to implement an integrative approach, which requires the implementation of climate change mitigation measures in other sectors. The EU has already initiated a climate and energy strategy towards the low carbon economy, which targets to reduce GHG emissions 20% by 2020 from 1990 levels. Although this target officially applies for the present 27 member countries, it also raises the parameters for the accessing countries like Turkey. The Commission has already expressed that obligations arising from Kyoto are an integral part of the Acquis on climate change. Turkey can not refrain from following these policies sooner or later. In this respect, Turkey needs to integrate climate change mitigation measures in all the related sectors, particularly energy sector.

In the process of the EU accession, Turkey should set a realistic and integrated climate and energy policy, taking into account its special circumstances. During the EU accession process and international climate negotiations, it should be noted that Turkey's level of industrialization and economic development, as well as the per capita GHG emissions, are lower than the EU member states, despite the rapidly growing emissions. Due to economic welfare considerations, Turkey hesitated for many years becoming a direct party to the Protocol and making a commitment to reduce GHG emissions 5% below 1990. In line with economic growth in Turkey, there had been a continuous rise in the GHG emission rates. It is estimated that this trend will continue depending on further desired economic and industrial development.

In the post-2012 global climate regime, Turkey, as accessing country to the EU and OECD member, is expected to take responsibilities and emission reduction commitments. Indeed this is a very important and difficult responsibility, which requires serious action, financing and policies over the political rhetoric. In this respect, Turkish government is now in the process of developing a strategy to reduce the growth of greenhouse gases.

[428] See: http://ecologic-events.eu/climate2012/warsaw-conference/documents/sum.pdf

During the accession negations, Turkey may ask for derogation and benefit from the bubble system of the EU in order to reduce its emissions while harmonizing with the EU environmental Acquis. In the EU enlargement process 10 countries in 2004 and 2 more countries in 2007 acceded to the EU. Among these countries Cyprus and Malta have an extraordinary position since they are Non-Annex I countries under the Kyoto Protocol, but also EU countries subject to EU-ETS[429] allocations. As Non-Annex I countries, they can utilize CDM. According to the Kyoto Protocol, the EU is not allowed to expand the EU bubble for the first commitment period until 2012. Consequently, the new EU Member States of the 2004 and 2007 enlargements can take place in the EU bubble after 2012. Nevertheless, as the parties of the Kyoto Protocol, they have their own commitments, except Cyprus and Malta. In this respect, Turkey may try to take a part in the EU bubble in the post-2012 climate regime; nevertheless, it seems unlikely for Turkey to complete all the reforms and the negotiations and to be an EU member until 2012. However, Turkey can still negotiate with the EU its stance in respect to climate policy as an accessing country and the international community under the UNFCCC. Turkey should search the ways to benefit from the EU ETS and EU Bubble system in the future membership target.

Especially in the post-2012 climate regime, Turkey can strengthen and deepen cooperation with the EU through flexible mechanisms and low-carbon investments. This is also an opportunity to pool the low-carbon and environmental friendly foreign investment into the country and to get economic, social and environmental benefits. Within this process, Turkey can focus on low carbon investment and renewable energies from biomass, wind, and hydro and solar, in which it has considerable potential. Investments in these types of energy production serve protection of environment while increasing energy security.

7.4.2. Energy Policy of Turkey and the EU Accession Process

Since the early 1980s, Turkish energy policy has concentrated on market liberalization in an effort to stimulate investment in response to increasing internal energy demand. Taking into account its young population, growing energy demand, urbanization, and economic development, Turkey has been one of the fast growing power markets of the world for the last two decades. It is expected that the demand for electric energy in Turkey will be 300 billion

[429] The EU ETS has already started operation as of January 2005. Under the EU ETS, the EU countries, which have their commitments specified in the EU Bubble, can trade emissions to reach their targets.

kWh by the year 2010 and 580 billion kWh by the year 2020. Turkey's electric energy demand is growing about 6% to 8% yearly due to fast economic growth, except the current year due to the global economic crisis.[430]

The main objective of the energy policies is to meet the energy needs of increasing population and growing economy in a continuous, qualified and secure manner through primarily private sector investments in a competitive and transparent free market. Therefore, the main target is to supply the required energy timely, uninterrupted and at minimum costs while making energy supply planning.[431] As an energy importing country, more than half of the energy requirement of Turkey has been supplied by imports. Oil has the biggest share in total primary energy consumption so that Turkey imports 90% of its oil. On the other hand, Turkey has large reserves of coal, particularly lignite since the proven lignite reserves amount 8.0 billion tons and estimated total possible reserves are 30 billion tons.[432]

The most the GHG emissions in Turkey come from electricity generation sector that has been a largely state-owned industry operating under non-commercial criteria. Following government decision to expand the industry in the late 1990s, subsidies have been growing. The import of natural gas has been controlled by state-owned enterprise that makes all contracts for the import of gas. For many years consumer prices are held low since the government has to pay for certain imported gas whether it is used or not and also in order to encourage households to convert to natural gas.

Turkey is eager to liberalize the energy market while trying to ensure energy security and energy efficiency. In this respect, Turkish Parliament passed constitutional amendments in February 2001 to allow competition in the electricity market, namely Electricity Market Law-Law No. 4628, in line with harmonization to the EU acquis. Natural Gas Market Law was adopted in 2001 and Petroleum Market Law was enacted in 2003. Currently, demand for electricity is boosted by a high level of so called "non-technical" system losses, which refers both to electricity that is consumed through illegal connections to the network and non-payment of bills.

[430] DPT, State Planning Organization, *Ninth Development plan 2007–2013,* Ankara, Turkey, 2006.
[431] *Ibid.*
[432] Kamil Kaygusuz ,*"Energy Use and Air Pollution Issues in Turkey",* 2007.

Renewable energy has an important role in the energy policy, which aims to ensure energy security, to provide an uninterrupted and reliable supply of electricity at low cost, to diversify energy sources, and to secure energy supplies as a whole. Despite its rich and diversified renewable energy resources, main electricity sources in Turkey are imported gas, lignite, oil, and coal, while 12 % of energy supply is from renewable energy sources.

The renewable energy supply in Turkey is leaded by hydropower and biomass. With the expansion of other renewable energy sources, such as solar and wind, the share of bio-mass, which contribute to air pollution and deforestation, in the renewable energy is expected to decrease. Turkey has substantial reserves of renewable energy sources, including approximately 1% of the total world hydropower potential. Moreover, there is also significant potential for wind power development. Although Turkey has the 7th biggest geothermal potential worldwide, only a small portion is considered to be economically feasible. This is mainly due to the lack of legal and institutional arrangements.[433]

In 2005, Turkish Government issued the first Renewable Energy Law, which was limited in terms of its ability to fulfill growing demand.[434] Recently, Draft Renewable Energy Law, which aims to attract domestic and foreign investment in renewable energy resources, has been prepared and forwarded to the Turkish Parliament. Moreover, in the last years the Ministry of Energy developed energy strategies that aim to provide consumers security and higher service quality, to reduce the share of fossil fuels in primary energy consumption, to encourage development and use of renewable energy sources and technologies through further incentives and subsidies.

Besides renewable energy, Turkey has remarkable energy saving potentials. By applicable measures in practices in industry, buildings, transport and energy sector, Turkey plans to diminish the energy density by unit national products at least % 15 until 2020. Energy efficiency is a horizontal issue so success of projects and activities depends on the participation and contributions of the all related actors.

[433] Ibrahim Yuksel, "*Global Warming And Renewable Energy Sources for Sustainable Development in Turkey",* 2007.
[434] Law No. 5346, published in the Official Gazette dated 18 May 2005 and numbered 25819

Turkey gives utmost attention to security of energy supply in an up-to-date manner that security of supply does not solely mean to maximize energy self-sufficiency or to minimize energy dependence, but also and more importantly mean to "reduce the risks" linked to such dependence.[435] Hence, balancing and diversifying of the sources of supply by product and by geographical region has become the heart of the EU's energy strategy. In this respect, Turkey's proximity to the most important gas fields of Central Asia, the Persian Gulf, Iran and Russia positions Turkey as one of the most attractive gateways for the "fourth artery" of the EU's energy supply.

Turkey is at the crossroads of several volatile, strategically and economically important regions, including the awkward triangle of the Middle East, the Caucasus and Central Asia. Thus, the geographical proximity to 70% of the world's proven energy resources places Turkey on the game board of energy politics.[436] Current pipelines around Turkey include Baku-Tbilisi-Ceyhan, Crude oil pipeline, Shah-Deniz Natural Gas Pipeline, Blue Stream Natural Gas Pipeline, Iraq – Turkey COP, Tabriz-Erzurum Natural Gas Pipeline and Nabucco Natural Gas Pipeline. Turkey is eager to be a main contributor to the security of supply of Europe by two main projects, namely the South European Gas Ring and Nabucco Project.[437]

Turkey is willing to become a major Eurasian energy hub. Through the evaluation of the geo-strategic location of Turkey in the Eurasian energy axis, it has a significant presence on the possible routes for carrying Caspian oil and natural gas to the world markets. Hence, Turkey is a passageway in the eminent "East-West Energy Corridor".[438] Taking the "Blue Stream Natural Gas Pipeline Project" and "Samsun - Ceyhan Transit Natural Gas and Crude Oil Pipelines" into account, Turkey also portrays a strategic feature in serving the "North-South

[435] European Commission, Green Paper, "*Towards a European Strategy for the Security of Energy Supply"*, *op.cit.,* pp.3-4.
[436] Temel Iskit, "*Turkey: A New Actor in the Field of Energy Politics?",* Perceptions Journal of International Affairs, March-May, Volume I, Number 1, 1996 p.82.
[437]Baku-Tbilisi-Ceyhan Main Export Crude Oil Pipeline Project (BTC) has been one of the major pipeline projects ever realized in the Eurasian energy axis. It is an important project since it is considered as a source of economic prosperity by oil trade for the chief participant states such as Azerbaijan, Georgia and Turkey. Most importantly, the BTC has strategic aspects that this project is supposed to reduce dependency on the Middle Eastern oil concerning the energy security of the countries. The significance of the BTC for Turkey is that the BTC serves a great potential to increase Turkey's prestige and intensify its relations with the participant states and the other transnational actors. See Zeyno Baran, "The Baku-Tbilisi-Ceyhan Pipeline: Implications for Turkey." in S. Frederick Starr and Svante E. Cornell (eds.), *The Baku-Tbilisi-Ceyhan Pipeline: Oil Window to the West*, Sweden: Central Asia-Caucasus Institute & Silk Road Studies Program, 2005, pp. 103-118.
[438] "East-West Energy Corridor" comprises the future accomplishments of Baku-Tbilisi-Ceyhan (BTC) Crude Oil Pipeline Project, South Caucasus Natural Gas Pipeline Project -SCP (Shah-Deniz Natural Gas Pipeline Project), here Baku-Tbilisi-Erzurum Gas Pipeline Project may be evaluated as a leg of Shah-Deniz Project and Turkmenistan-Turkey-Europe Natural Gas Pipeline Project or "Trans Caspian Gas Pipeline Project" (TCGP).

Energy Corridor". Therefore, the struggle for meeting its own energy needs and being an important transit path puts Turkey into a multifaceted situation.

From the strategic point of view, Turkey's accession might help the EU to access to the rich energy resources in the Middle East, Caucasus, and Central Asia. This would increase the diversification of energy resources and contribute to the energy security of the EU, in return contributing to its global leadership. The EU has activated this discourse in the recent progress reports of Turkey via stressing the efforts to strengthen Turkey's position as a transit country by actively participating in projects of common interest for Trans-European Energy Networks as well as regional formations. Nonetheless, the European Union has continued to sign bilateral natural gas contracts particularly with Russia. From the political point of view, on the other hand, the expected process in energy supply security may once again question the European perception of Turkey whether it is a wall or a bridge tackling with the "chaotic" environment of the Middle East.

This may bring two occasions; the first and perhaps the challenging one is that the EU can perceive Turkey merely as an energy transit country and can act within this manner. This proposition may also lead a unilateral economic perception of the EU that the security of the pipelines and secure flow of the fuels could be the best dealing ground between two parties.[439] The second occasion can be a new perception, which changes Turkey's position to the level of *persona grata* instead of a shield or bumper state vis-à-vis the political and economic instability of the Middle East. The latter somehow sounds better due to the Turkey's perspective regarding the pipeline issues that might be sent to the EU.

Turkey's current perspective vis-à-vis the EU's, on the other hand, seems to sustain the overall progress within the accession process. Hence, the geo-political advantage of Turkey serving as the fourth main energy artery to the EU may be limited dealing with the stipulations of the EU. This means that Turkey might behave as a future integral part of the EU and somewhat obey what the EU compels in the energy transmission. This can further mean that the intention of being an alternative passage way of energy may at most be a political facilitator, not yet a bargaining power, under the current situation. The role of Turkey

[439] While ensuring its energy security by means of pipeline development to carry gas to the EU market via Turkey, the EU may also intend the routes through as a complement, rather than compete with, Russian pipeline supplies. See John Roberts, "The Turkish Gate, Energy Transit and Security Issues", *Centre European Policy Studies*, EU-Turkey Working Papers, No.11, October 2004, p.100.

as a political actor in European energy policies depends on the question whether Turkey can come out as a strategic bargainer or remain only as an economic partner in various organizations.

7.5. Particularities of Turkey: Current Position and Stance in the Post-2012 Climate Regime

7.5.1. Turkey's Special Circumstances and Indicators

Within the UNFCCC, Turkey has been trying to explain its special circumstances, which was finally approved by the Decision 26/COP.7 in 2001 in Marrakech. Nevertheless, this decision is an "empty box" since it does not specify the special circumstances of Turkey but rather invite the parties to recognize Turkey's special circumstances other than Anne I parties. Moreover, this decision under the UNFCCC was not repeated in under the Kyoto Protocol. Although Turkeys refers often this decision, it has never specified these special circumstances for the approval of the UNFCCC and Kyoto parties.

Turkey was listed in the Annex I to the UNFCCC as a developed country with other OECD countries, despite the fact that it was not a developed but rather a developing country in those years. Hence, Turkey rejected to sign the Kyoto Protocol for many years, since as an Annex I country, it would be placed in the Annex B list of the Kyoto Protocol with binding quantified emissions reduction targets. Nevertheless, as a developing country, which has started to industrialization process in the 1980s, Turkey would not be able to take commitments below the base year of 1990.

It is difficult to categorize Turkey as either a developed or developing country. Despite the fact that Turkey made considerable progress to westernize and improve its economy rapidly since the 1980s, it is still behind the developed industrial countries. Turkey's purchasing power parity in terms of GDP per capita is still the lowest comparing to the EU and the OECD countries. Turkey is ranked as the 17th largest population and the 17th biggest world economy in terms of the worlds leading nominal Gross Domestic Product according to 2008

data. Nevertheless concerning GDP per capita, Turkey takes place in the 45th row.[440] Despite a high ranking in terms of GDP, the country confronts great regional disparities and inequalities in the distribution of income and wealth.[441]

On the other hand, in the recent years, Turkey does not show fully the characteristics of a developing country. Hence, it is more convenient to call Turkey as an "advanced-developing country". There are some other countries similar to Turkey in this respect, such as; Brazil, Argentina, South Korea, Kazakhstan and Mexico, which differ from the majority of the non-Annex I countries concerning their high economic growth and emissions patterns.

Since the early 1980s Turkey has been transforming to the market economy through major changes in terms of rapid overall economic growth and structural changes. Despite strong and rapidly growing private sector, the share of the informal sector in the Turkish economy remains high. As one of the most densely populated countries in the world, Turkey's population has reached 73 million in 2008.

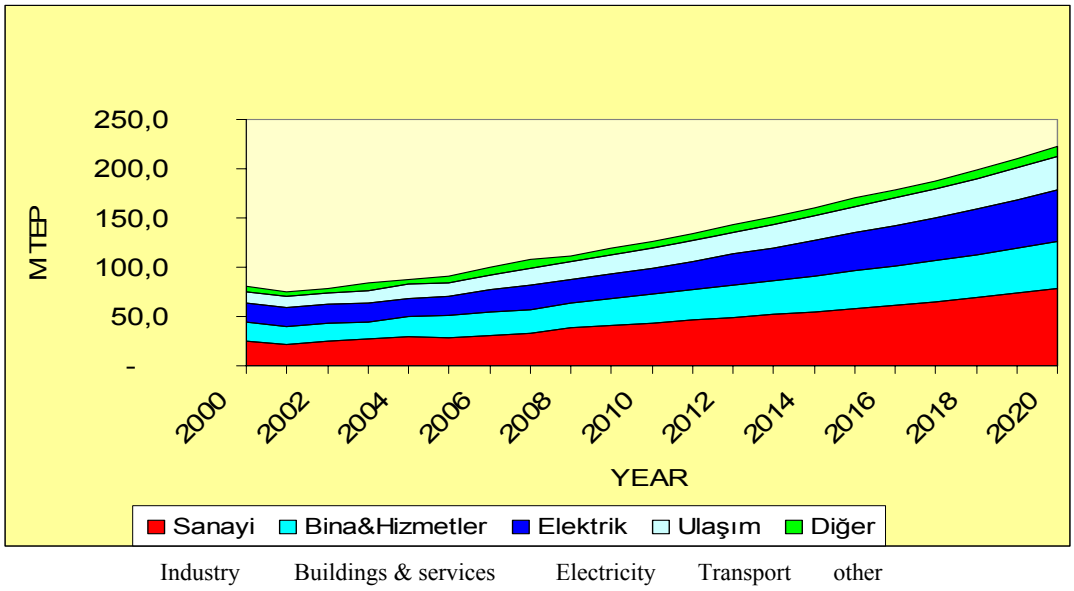
With its annual population growth rate of 1.2% since 1990, Turkey is one of the fastest growing populations in the OECD.[442] Moreover, the demographic composition of Turkey changes rapidly, due to on going migrations from rural areas to urban, industrial and tourism areas. The urbanization ratio of Turkey has reached to 61.4% in 2006 from 52.9% in 1990. The high levels of population accelerate the pace of urbanization and the consumption of natural resources and the scale of the waste generated.[443]

Turkey's dynamic economy represents complex mix of modern industry; on the other hand the traditional agriculture sector still accounts about 29 % of employment in 2008. In addition to agriculture, urbanization and the developments in the industrial, commercial and tourism sectors have caused an increase in variety and amount of pollution sources. In accordance with the economic growth, demand for energy and electricity is increasing about 6% to 8%

[440] See "The World Bank: World Development Indicators database, 1 July 2009.. Available at: http://siteresources.worldbank.org/DATASTATISTICS/Resources and http://siteresources.worldbank.org/DATASTATISTICS/Resources/POP.pdf
[441] Alevgul Sorman,, "A National Assessment of Sustainable Development Indicators in Turkey with Examples of Local Scale Modeling Using a Systems Dynamics Approach", Lund University, 2007, pp. 3-4.
[442] Turkstat, TUIK, Turkish Statistical Institute, *"GHG Inventory of Turkey"*, 2009. Available at: www.tuik.gov.tr
[443] See www.tuik.gov.tr

annually in Turkey, which is heavily dependent on expensive imported energy resource.[444] In this respect, Turkey is among the first 25 countries whose energy use in the industrial sector shows the most rapid increase due to continuing industrialization. The rapid growth of energy demand and dependence to imported resources places a big burden on the economy while raising a wide range of environmental issues at local, regional and global levels. In this context, Turkey confronts the challenge of ensuring economic growth, which is associated with environmental and social progress.

Figure 7.2 Projected Total and Sectoral Energy Consumption in Turkey



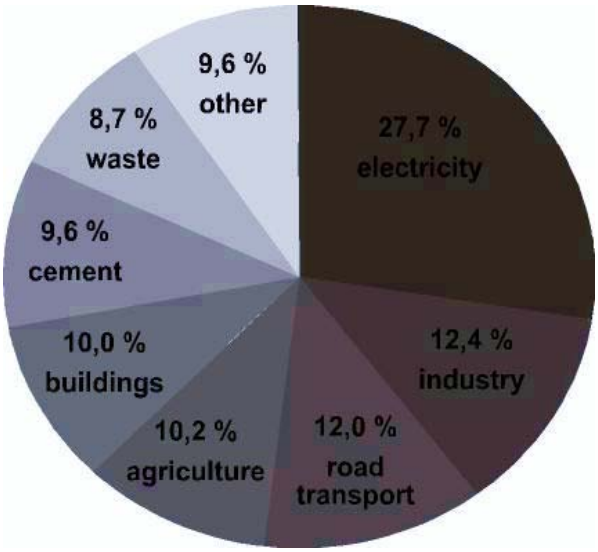
Source: Ministry of Energy, 2007

As a rapidly growing country Turkey's income level is moving towards that of the rest of the OECD area. This catch-up process has been associated with increasing energy demand as well as rapid growth of GHG emissions. Actually, the drastic increase of economy and energy demand demonstrates the feature of advanced developing country. Since the carbon emissions from any country contribute equally to the pressure on the global climate, this issue has to be tackled within the common global action. Therefore, the policy makers seek the way to contribute to reducing the burden on global resources at lowest cost without jeopardizing the rapid growth of Turkish economy.

[444] See www.tuik.gov.tr

According to 2006 data, Turkey ranks as the 23rd country within the list of countries that have highest total GHG emissions. In this respect, the contribution of Turkey to the total GHG emissions of the world is around 1%.[445] The total GHG emissions of Turkey increased steadily by 119 %, from 170.1 to 372.6 Mt CO_2, in the period 1990-2007 due to the country's steady population and economic growth and intensive industrialization. In 2007, with % 77 energy sector has the largest share within the total GHG emissions equivalent to CO2, which is followed by waste disposal 9%; industry 7% and agriculture 7%.[446] The figure 7.3 shows the share of sectors in total emissions in 2007.

Figure 7.3 Sectoral Emissions in Turkey (2007)



Source: State Planning Organization, Republic of Turkey

Although Turkey's emissions have almost doubled during the period between 1990 and 2006, emissions per capita in the country are still relatively low compared to EU and world average, due to the low levels of final energy use per capita. In 2006, Turkey's ratio of per capita CO2

[445] UNDP, *"Human Development Report 2007/2008 Fighting Climate Change: Human Solidarity in a Divided World"*, Palgrave Macmillan, New York, 2007.
[446] Turkstat, TUIK, Turkish Statistical Institute, "*GHG Inventory of Turkey*", 2009. Available at: www.tuik.gov.tr

emissions accounts 4.6 ton CO2-e, which is under the global average of 7.5 ton and EU 27 level of 10.4 ton, as shown Table 7.2.

Table 7.2 Comparison GHG Emissions Per Capita (2006)

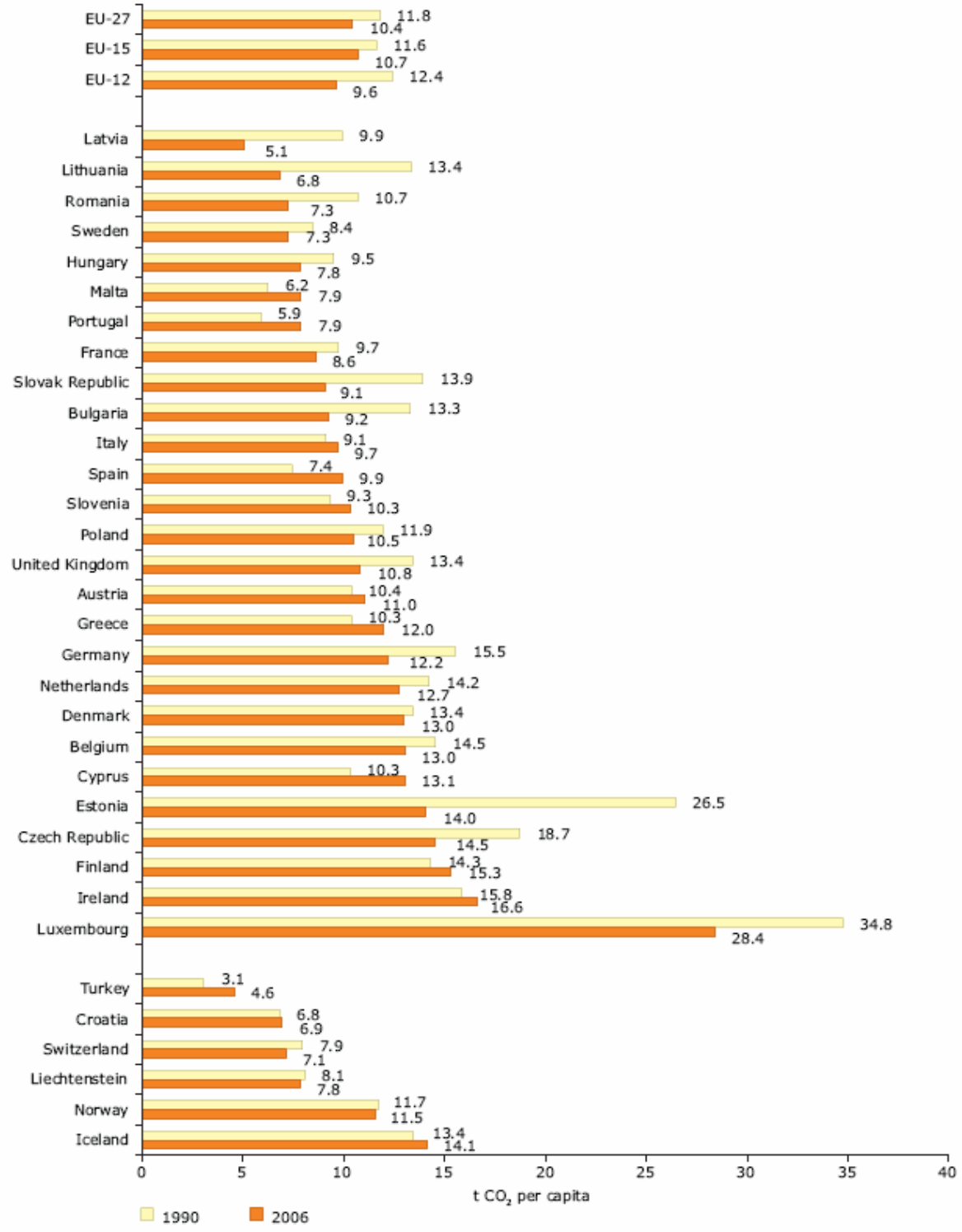
EU 27	10.4
EU 15	10.7
World	7.5
Turkey	4.6
China	4.6
Russia	11.9
US	19.7

Source: IEA, International Energy Agency, *"The World Energy Outlook 2009 Climate Change Excerpt Special Early Release at Bankong UNFCCC Meeting",* Paris, 2009.

As indicated in Figure 7.4, Turkey's per capita GHG emissions are much lower than the EU-27 countries. Nevertheless, we should note that in the same period Turkey's per capita emissions increased by 49 %.[447] The rapid increase in the GHGs since the 1990s despite the relatively low CO2 per capita in Turkey demonstrates that the country still continues to its development as non-Annex I parties developing countries does. Hence Turkey has special circumstances compared to the other Annex I countries.

[447] EEA, European Environment Agency, *"Annual European Community Greenhouse Gas Inventory 1990–2007 and Inventory Report 2009 Submission to the UNFCCC Secretariat Version",* Technical report No 4, Copenhagen, 2009.

Figure 7.4. GHG Emissions per capita in Europe (1990-2006)

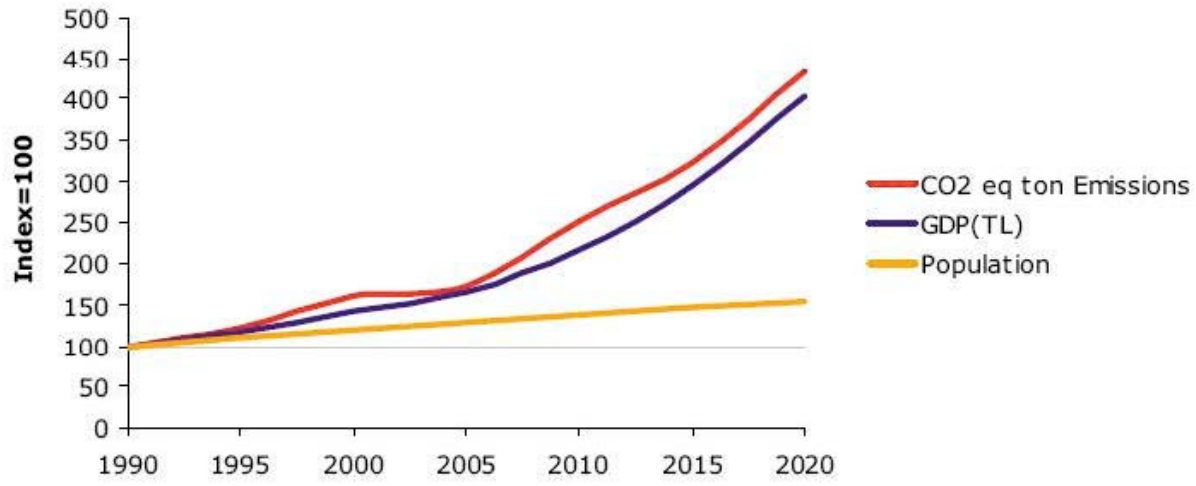


Note: For 1990 data, the population of the French overseas territories (DOM) provided by the French statistical office was added to the total population of France métropolitaine provided by Eurostat. Post-1990 population data from Eurostat covers the whole French territory, including overseas territories.

Source: EEA, European Environment Agency, *"Annual European Community Greenhouse Gas Inventory 1990–2007 and Inventory Report 2009 Submission to the UNFCCC Secretariat Version",* Technical report No 4, Copenhagen, 2009.

According to the National Communication of Turkey in 2007, the "business-as-usual" scenario projects an increase in CO2 emissions by 6.3% annually reaching a total of 604.63 mill t/year by 2020, which amounts almost double from 2005 to 2020 and represents more that 255% growth compared to 1990 levels (Figure 7.5). This significant growth of emissions is due to the high growth in final electricity demand as well as the continued significant reliance on fossil fuels in this sector, despite the increased usage of natural gas, nuclear and renewable energy. On the other hand, the scenario "with measures" projects that national CO2 emissions will reduce in 2020 by 75 mill t/year or by 12%. Hence, Turkey faces an enormous challenge in reducing GHG emissions now and in the post 2012 period. The figure 7.5 shows that GHG emissions in 2020 are projected to rise sharply in parallel with increase in its GDP.[448]

Figure 7.5 Projections of GDP- CO_2 -Population



Source: Ministry of Environment and Forestry, "*First National Communication on Climate Change, Republic of Turkey"*, Ankara, January 2007.

The rapid growth in emissions is related to the different evolution in the GHG intensity of the economy generated both by an increase in the use of energy per unit of output and an increase in GHG emissions per unit of energy supplied from renewable sources, such as wood, animal waste, hydroelectricity and geothermal energy. In spite of rapid growth of economy-wide greenhouse gas intensity, by 2006 carbon dioxide emissions per unit of GDP were similar to the average in the OECD area. Since emission density increases rapidly in all sectors in

[448] MoEF, "*First National Communication on Climate Change, Republic of Turkey"*, Ankara, January 2007, p.7.

Turkey, it can threaten the trade on the manufactured products in Turkey for the upcoming years since emission intensive sectors may face non-tariff barriers in the future.

Table 7.3 European Countries Industrial Sector Emission Density (t CO2/ tpe)

Turkey	2.80	France	1.69
South Cyprus	2.74	Italy	1.63
Slovakia	2.23	Luxembourg	1.63
Czech Republic	2.23	Estonia	1.55
Poland	2.23	Portugal	1.54
Bulgaria	2.11	The Netherlands	1.50
Romania	2.08	Spain	1.49
Greece	2.07	Denmark	1.47
Belgium	1.97	Slovenia	1.34
Latvia	1.89	Lithuania	1.32
Ireland	1.80	Switzerland	1.19
Germany	1.80	Sweden	0.97
Hungary	1.76	Finland	0.95
UK	1.76	Norway	0.83
Austria	1.71	Malta	0.60

Source: European Council, Head of Transportation and Energy Department, 2006.

The EU Commissioner for Environment, Mr. Stavros Dimas, underlined that Turkish economy is 25% more energy intense comparing to the EU average, although the per capita CO_2 emissions in Turkey is almost the half of that in the EU. Energy intensity of the Turkish economy can be decreased by low carbon investments so that both the global climate and the energy efficiency of Turkey would improve. These results would be beneficial for the Turkish citizens since energy could be spent at a lower cost. Therefore, as prerequisite for sustainable development, integration of climate change policies into the other sectors is an efficient tool

for enhancing economic development and competitiveness, which would be benefit of the citizens of the country in the long term.[449]

Taking into consideration the GHG emissions indicators and the potential impacts of climate change on the country, it is apparent that 'wait and see' policies can not be applicable anymore. Indeed, the current situation and findings necessitate Turkey to formulate and pursue comprehensive environment, climate and energy policy in line with the principles of sustainable development.

7.5.2. Management of Environment and Climate Change Policies

Environmental issues have entered the Turkish political agenda in the 1980s. In accordance with its rapidly growing economy, Turkey aims to improve the competitiveness of its economy and people's quality of life. Hence, the issues of environment ranks in the last rows of the priority list, so it gets less share in the national budget. The legal and institutional structure of environment policy develops in line with the global developments and consciousness. The environment and climate change policies are governed by the central government due to concentration of power in the utmost traditional state based governance mechanism.

The Ministry of Environment and Forestry (MoEF) is the primary organization responsible for policy making, implementation, enforcement, auditing and monitoring in the environmental field. The MoEF have cooperation with other ministries, governmental agencies, local authorities and NGOs. As one of the main bodies in MoEF, the Directorate General for Environmental Management (DGEM) co-ordinates the activities on Ingrated Industrial Pollution Control (IPPC) through the Air Management Department, Chemicals Management Department, Waste Management Department, Water and Soil Management Department, and Measuring and Inspection Department which are the Units of DGEM.

The MoEF works to harmonize all policies and applications as well as environmental law with the environmental policies of Turkey with those of the EU. For this purpose, the MoEF

[449] Speech of Stavros Dimas; Europe's Contribution to a Low Carbon Economy, January 26, 2009. Available at: http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/09/21&format=DOC&aged=0&language=EN&guiLanguage=en

developed "EU Integrated Environmental Approximation Strategy (2007-2023)" in order to harmonize Turkish environmental legislation with the EU environmental acquis.[450] In this respect, the General Directorate for Environmental Management at the MoEF has prepared an Approximation Strategy for the IPPC with the European Union environmental Acquis. IPPC directive is one of the major priorities for the MoEF. Transposition of the industrial pollution control sector requirements is at an early stage in Turkey in the absence of integrated pollution prevention and control system in place.

In spite of the vast environmental legislation and institutions, the corruption and 'politicization of judiciary' prevents the implementation of these legislations. Hence, the main problem of Turkey in environmental issues is not lack of legislation but rather a lack of implementation and sincere political rhetoric. In this respect, the regulatory effectiveness of state system is generally uneven and inefficient. The bureaucracy fails to execute the policy decisions due to the low competence levels of central and local officers, the existing incentive structures that are not sufficiently promoting efficiency and effectiveness, and the fact that civil servants are influenced by political processes.

The lack of common understanding of notion of environmental protection and sustainable development among the public is triggered by lack of comprehensive and integrated policy approach. Apart from the national and technical indicators, capacities and capabilities, climate policies are related to the level of consciousness and importance attributed to the issue at the state level, the perceptions of the Government officials, political parties, the involvement of the Government, the level of involvement of the non-state actors and the business lobbies as well as the level of public awareness.

Especially since early 1990s, environmental NGOs and social movements have a considerable role in evolution of policies in environmental protection and sustainable development. As an example of strong environmental NGOs, TEMA[451] foundation combats soil erosion and deforestation while TURMEPA works against the sea and costal pollution and WWF-Turkey and Doga Dernegi supports successfully biological diversity. On the other hand one of the most influential industrialists NGO, TUSIAD has supported in its public reviews and taken

[450] MoEF, Ministry of Environment and Forestry, "*EU Integrated Environmental Approximation Strategy (2007 - 2023)"*, 2006, Ankara.
[451] Turkish Foundation for Combating Soil Erosion, for Reforestation and for the Protection of Natural Habitats.

rather concrete steps to put sustainable development into the agenda of Turkish politics and increase awareness. Despite the increasing voice and strength of the civil society in environmental issues, their position is not necessarily translated into concrete political and material practices.

Turkey wasted significant time until taking a part in the global climate regime. During this time, the related ministries and decision makers were not able to form a common perspective and policy in the issue. Hence, Turkey started considerably late to create climate policies, related legislation, measures, tools and institutional capacity.

Since the early 2000s and especially following Turkey's accession to the UNFCCC in 2004, climate issues have started to take place in public agenda. At the state level, the Minister of Environment together with related ministries and institutions started to prepare reports and to organize workshops, seminars and conferences. In addition, several commissions have been established in order to examine the issue and make background preparations for the developing related policies and measures. Apart from the Ministry of Environment and Forestry (MoEF), the other ministries are also responsible for integrating environmental policy targets laid out in the EU Integrated Environmental Approximation Strategy.

In 2001 within auspices the MoEF, an inter-ministerial Coordination Board on Climate Change (CBCC) was established for development of prevention, mitigation and adaptation of policies against climate change. The CBCC also works to fulfill the requirements of UNFCCC obligations like the preparation of National Communications. Under the CBCC, a Technical Working Commission on Climate Change operates for preparation of the National Communication through the studies and reports prepared by eight different working groups. The Ministry of Environment and Forestry has submitted Turkey's first GHG inventory and National Communication to the UNFCCC Secretary in January 2007. In the same year, the Research Commission on Global Warming was established under the Turkish Grand National Assembly.

The 9th Development Plan (2007-2013) calls for the preparation of a 'Climate Change National Action Plan' for the establishment of national policy concerning the mitigation and adaptation to climate change. The Plan estimates that the efforts to protect the environment will be costly in the short term, however, demonstrates that improving the competitiveness of

the country in the long term in a sustainable manner could be achieved only through these costly investments.[452]

7.5.3. Position and Arguments of Turkey in the Post-2012 Climate Negotiations

In 2007, Turkey submitted the First National Communication on Climate Change to the UNFCCC. The report was prepared by the Ministry of Environment and Forestry with the technical support of the United Nations Development Programme (UNDP) and the financial support of the Global Environment Facility (GEF). As indicated in the report, according to 2003 verifications, Turkey's ratio of per capita CO2 emissions is 3.3 ton, which is under the OECD level of 11.1 ton and EU level of 9.0 ton. Indeed, in 2006, Turkey's ratio of per capita CO2 emissions accounts 4.6 ton CO2-e, which is under the global average of 7.5 ton and EU 27 level of 10.4 ton. Accordingly, Turkey's per capita CO2 emissions is line with China's. Nevertheless, we should note that in the same period Turkey's per capita emissions increased by 49 %. [453]

In this respect, it is called that special circumstances in Turkey should be taken into account concerning the additional obligations of the Annex I countries. Therefore, the official position of Turkey is that the commitments of Turkey should be based on equity and fairness while taking into consideration the "differentiated responsibilities" and "individual circumstances" of the parties. In the National Communication, it is declared that "Turkey calls for equality of sacrifice rather than equal reduction in emissions". In this respect, as an Annex I country, obligations imposed to Turkey should reflect the different structure and capabilities of the economy and industry, while taking into account the level of industrialization.[454]

In 2009 Turkey ratified the Kyoto Protocol however, as a late comer it does not have any reduction commitment in the first commitment period of 2008-2012. Currently, Annex I list of the UNFCCC is composed of 41 Parties. Except Belarus and Turkey, all the Annex I Parties have been placed in the Annex B list of the Kyoto Protocol. Turkey and Belarus were not placed in Annex B to the Protocol, since they were not Annex I Parties when the Protocol

[452] DPT, State Planning Organization (SPO), "*The 9th Development Plan 2007-2013*", *op.cit*. p.115.
[453] EEA, European Environment Agency, "Annual European Community Greenhouse Gas Inventory 1990–2007 and Inventory Report 2009 Submission to the UNFCCC Secretariat Version",op.cit. p.6.
[454] MoEF, "*First National Communication on Climate Change, Republic of Turkey*", Ankara, January 2007.

was signed. With ratification of the Protocol by Belarus[455], Turkey has been left to be the only Annex I country, which has not become a Kyoto Protocol Party. The uniqueness of Turkey's status within the climate change regime emanates from this position. Nevertheless, commitments of Turkey in the post-2012 global climate regime are up to the negotiations. Turkey seeks to be placed in "advanced developing country" list, which commits to reduce business as usual GHG emissions, under new climate change agreement. The options for Turkey are listed in the figure 7.4.

Table 7.4 Options for Turkey in Post-2012

Option	Consequences
Annex B	Meeting the expectations, but difficult to define and comply, possible JI
Negotiate special position (non Annex B)	Not meeting the expectations, including those of the EU, but easier to comply and reflects the national circumstances. NAMAs to be in place, possible sectoral emissions trading
Outside of the new 2012 regime	Outside of the international arena, problems with all other related international treaties and EU membership

As set in Bali Action in 2007, in the Post-2012 negotiations countries try to agree on a Shared Vision for Long-Term Cooperative Action. In terms of common vision and reduction, Turkey argues that, the Common Vision should cover all the aspects of Bali Action Plan and meet the expectations of all the parties under the Convention by taking into account the balance and justice among the four basic elements of reduction, adaptation, finance and technology of Bali Action Plan. Moreover, Turkey calls that the Common Vision should be real; economically

[455] In 2005 Belarus applied for becoming a Party to the Protocol with a commitment of 5% below its emissions in 1990. It has been accepted in COP12 that Belarus will take its place in the Annex B to the Kyoto Protocol with a reduction target of 8% as of 1990 as the base year. Belarus, although have joined the Kyoto Protocol by taking its place in the Annex B, it might not be able to utilize the flexibility mechanisms of the Protocol within the first commitment period

achievable, politically applicable and acceptable by the all parties in terms of long term global targets, while containing the certain definition of the political will.[456]

Turkey argues that the shared vision should be realistic and inclusive, while considering the concerns, views and demands of all Parties. Therefore, the aim should be developing a broad understanding that can reflect the positions of all members of the UNFCCC family. According to Turkey, the Convention should encourage all states to adapt a pathway towards a low carbon society. Moreover, the new regime should contain necessary incentives to facilitate and motivate the involvement of all Parties through a fair, equitable, flexible and dynamic approach. Turkey believes that this vision shall reinforce the economic development rights of the Parties and shall promote it in a sustainable manner.[457]

Taking into account the level of economic and social development, Turkey argues that there should be differentiation and classification among Parties in terms of national capacity, economic development level and respective capabilities in order to establish successful post-2012 agreement. Meanwhile, it advices taking into account the national capacities and special circumstances of the Parties under the principles of "common but differentiated responsibilities" and "equity and respective capabilities". Accordingly, developed and developing countries can be differentiated based on the national circumstances, historical responsibilities, development levels, economic and social indicators, such as GDP per capita, energy consumption emissions per capita, population growth rate, import dependency, foreign debt, and human development index.[458]

Apart from the economic differences between developed and developing countries, Turkey also draws attention to the different level of economic development among Annex-I parties. While there are non-Annex-1 countries, whose development levels are higher than the OECD averages, some of them have development levels lower than Non-Annex-I parties. In line with this argument, Bali Action Plan used the terms “developed countries” and “developing countries” instead of referring to the Annexes. In this respect, Turkey claims that the definitions of “developed countries” and “developing countries” should be revised. Turkey

[456] UNFCCC, “Paper No.3: Information, views and proposals by Turkey regarding paragraph 1 of the Bali Action Plan of the Ad Hoc Working Group on Long-Term Cooperative Action under the Convention”, 2008. pp-101-105. Available at: http://unfccc.int/resource/docs/2008/awglca4/eng/misc05.pdf
[457] *Ibid.* pp.101-105.
[458] *Ibid.* pp.101-105.

believes that differentiation among developed Parties on the basis of composite indicators is crucial in identifying future commitments or actions in terms of mitigation or technological and financial supports.

Indicators for Turkey show the patterns of developing countries. Having not completed her industrialization process yet, Turkey is neither a wealthy nor a rich country, comparing to the Annex-I countries. Therefore, Turkey argues that differentiation among developed and developing Parties should be clarified before defining the nationally appropriate commitments or actions. Turkey has carried out significant progress at sectoral level although it doesn't have any GHG limitation responsibility under the climate change.

Turkey declares that it is ready to fairly contribute to the climate regime by its own private conditions and accepts the National Appropriate Mitigation Activities (NAMAs). Whether included in Annex B or not, Turkey has already announced taking on "no-lose target". This should be further advanced in estimating concrete numbers for deviation from the BAU and development of a Low-Carbon Development Strategy (LCDS), which should include emissions inventory, including key parameters and a projection of BAU emissions for key sectors; estimates of emission reduction targets for each category of action, in the short term and with identification of long-term targets; and finally specific needs to support implementation.

Turkey needs technology transfer and financial support in the access to low carbon economy. Turkey should switch to low-carbon development, employing national efforts and international support. In addition, the government and industry should further strengthen their capacities and cooperate at international and national levels. In this respect, possibilities to participate in the new emissions trading mechanisms should be utilized.

In the new climate regime, adaptation is one of the crucial issues for Turkey. Turkey draws attention to increasing adaptation capacities of the countries that would extremely be affected by the climate change. According to the IPCC 4 Assessment Report, as located in the Mediterranean Basin, Turkey is estimated to be affected by the climate change. In this respect, in recent years Turkey tries to increase the adaptation through some measures in effective water management, irrigation, aforestation by its own resources. Turkey suggests establishment of a multi-choice international insurance mechanism to compensate loses and

damages by extraordinary disasters due to climate change addressed. Moreover, Turkey suggests establishment of a new Technology Transfer Mechanism that contain the priority credits and investment subsidies such as export credits for the access and development of new technologies.

Besides development and transfer of technology, financing is a crucial challenge in the establishment of new climate regime in the post-2012 period. Turkey believes that financial mechanisms of the new climate regime should be designed by taking into account the historical responsibilities, current emission levels and financial capacities of the Parties. Hence, these criteria should determine the contributions to the financial mechanisms or benefiting from them. On the other hand, Turkey underlines the urgent need to enhance the current flexibility mechanisms to have more functional structures. Turkey argues that application principles of Clean Development Mechanism should be revised to allow the Annex I countries, like Turkey, to host the projects.[459]

7.5.4. Suggestions for Turkey in the Post-2012 Climate Regime Negotiations

Climate change, which is not only an environmental problem, has direct affects on the resource use, investments and technology in the sectors like energy, industry, transportation, agriculture and forestry. The fight against climate change requires transformation into a low carbon economy in the long term so that as other countries, Turkey needs to achieve this transformation at a lower cost. If countries postpone initiating this transformation, they might confront bigger challenges to deal in higher costs. The industrialized countries, which have historical responsibility and financial and technical capacities, should contribute more to addressing climate change. Nevertheless, this can not be achieved without participation of all countries in accordance to their capacities and levels of development. Hence, Turkey, as a country having responsibility for the current and future generations, should be active in the global climate regime in line with its national capacity.

Some argue that Turkey should not be expected to take any responsibilities since it has not been responsible for the evolution of the climate change. Ironically, the most vulnerable

[459] UNFCCC, "Paper No.3: Information, views and proposals by Turkey regarding paragraph 1 of the Bali Action Plan of the Ad Hoc Working Group on Long-Term Cooperative Action under the Convention", pp-101-105.

countries to climate change are the poorest and less developed countries that do not have responsibility for the rapid rise of global GHGs. Despite the limited contribution of Turkey to climate change until 1980s, this picture changed dramatically in the last decades. Turkey's emissions have increased by 119% from 1990 to 2007. In order to handle this dramatic trend, Turkey needs to control its emissions immediately through convenient measures and policies.[460]

Economic development has been a long standing priority of Turkish politics. Hence, Turkey has been facing the environment versus development dilemma since measures for protecting the environment are generally perceived as burdens on economic development and growth. However, the urging trends of the global climate change and the international negotiations oblige Turkey to reconcile its economic development goals with environmental protection measures in order to ensure its future development in a sustainable and successful manner.

Turkey's ratification of the Kyoto Protocol in 2009 is a signal of her willingness to actively participate in the global efforts. Since Turkey does not have any commitment, in the first Kyoto phase of 2008-2012, this provides a preparation period for Turkey. In this respect, Turkey should concentrate necessary grounds for participation in related groups and organizations, such as involvement in EU-ETS prior to full membership or in groupings of countries with similar development levels in order to introduce new kinds of targets, base years or even new Annexes for the post-2012 period.

The discussions for the post-2012 period constitute opportunity to overcome inadequacies of the Kyoto Protocol. Turkey should closely observe negotiations about possible new country grouping under the Kyoto Protocol Annexes. Turkey may act together with countries, which are in a similar developmental stage with Turkey, including Mexico, South Korea, and South Africa, that can be called as 'advanced developing countries'. Depending on the 26/CP7, which places Turkey in a position that is different from that of other Annex-I Parties, Turkey, as a non Annex-B Party of the Kyoto Protocol, needs to negotiate its position as an advanced developing country. In this respect, Turkey needs to ask to have flexible targets in terms of setting alternative reference year, instead of taking an absolute GHG emission reduction target

[460] Turkstat, TUIK, Turkish Statistical Institute, "GHG Inventory of Turkey", 2009. Available at: www.tuik.gov.tr

with respect to 1990 level. In this issue, Turkey can cooperate with South Korea and Mexico, which have no commitments under the Kyoto Protocol although they are OECD members.

Turkey should pursue an active policy in global climate change. For that purpose Turkey should make studies at regional and national levels to find a solution for its increasing level of GHG emissions in Turkey due to unplanned industrialization and urbanization. In this framework, Turkey needs a strategy and an action plan on climate change to find a balance between environment and industry in sustainable way. Moreover, depending on the scientific data, researches and GHG inventory, Turkey should put very clearly its position and commitments for post-2012 climate regime in line with the process of the EU accession negotiations.

In order to set comprehensive and effective climate policy in line with the post-2012 negotiations and EU accession process, Coordination Board on Climate Change (CBCC) was established in 2001 and revised in 2004. Nevertheless, this Board should increase its capacity and provide a ground for coordination between the Ministries, public institutions and civil society. Turkey participates to the last COP meetings with a relatively large group, including the representatives from several Ministries. Nevertheless, Turkey needs fully authorized Chief Negotiator for the international climate negotiations in order to strengthen and defend better its position and special circumstances.

Turkey should position itself in a way that will enable participation in the possible new flexible mechanisms. In order to position itself in the right list with commitments accordance to the realities and capacities of the country, Turkey should follow these developments closely to be able to come up with an appropriate Turkish climate change policy for the post-2012 period. For the post-2012 climate regime, Turkey should avoid from the commitments, which will threaten the sustainable development and welfare of the country by taking into account of industrialization and development level. In order to achieve this, Turkey needs a strategy based on reliable data, information and arguments. Moreover, in this process, it is vital to have an effective climate change strategy, which will take into account the industry-environment balance namely the principles of sustainable development. In line with this strategy, a national adaptation strategy and an action plan should be determined and put in practice. According to the renewed conditions and needs, legal and institutional capacity

building and reform process should be renewed in the long term, while legal and institutional structures are established for emission calculation and recording in the short term.

Turkey is Annex I, but not Annex B, therefore eligible neither for JI nor for CDM. Since Turkey, as a late comer, will not be able to benefit from flexible mechanisms of the Kyoto Protocol, it should immediately initiate institutional and legislative studies on voluntary carbon mechanisms. Many companies have been already engaged in voluntary carbon trading in Turkey, but there is neither legal and institutional structure, nor a registration mechanism. In this respect, there is need for voluntary carbon market and stock exchange in the short term.

Turkey should successfully implement the adaptation strategies to climate change; reconsider the targets for sustainable development; develop the renewable energy resources; increase the technical productivity in energy sector; rehabilitate the present coal based energy plants; improve public transport; enlarge the forest areas; develop and implement environment friendly technologies; take into account of energy efficiency and carbon density; successfully implement a program that will leave the past understandings in the past. In this framework, it is very important to ensure participation of all public organizations, agencies, private sector, NGO's and universities in this process. For this purpose an extensive national dialogue has to be triggered urgently.

Turkey should take measures to slow down the rapidly increasing total emissions due to its large and increasing population, continuing industrialization and development. By applying appropriate measures in the frame of global climate regime, Turkey can continue its economic development on a more sustainable path, which brings economic and social benefits. In this respect, the main measures for Turkey are increasing energy efficiency in end-use sectors, fuel switching and increasing the use of renewable energy sources, particularly hydro resources. In 2004 12.3% of Turkey's total primary energy supply was provided from renewables while energy conservation studies indicate that Turkey has 25% energy conservation potential in all sectors.[461] Therefore, optimum use of resources should be employed in every sector. Moreover, Turkey needs a comprehensive strategic plan in this issue. Though being quite late, Ministry of Environment and Forestry started studies for

[461] MoEF, "*First National Communication on Climate Change, Republic of Turkey"*, Ankara, January 2007.

National Climate Change Action Plan Strategy, which will be a guiding plan for all the sectors concerning the climate change policy priorities and measures.

Comprehensive climate friendly low-carbon economy requires considerable public awareness, which can be increased through education, media and civil society. Individuals and the companies are the main coresponders in this respect. Hence, economic benefits of climate change policies, such as energy security, public health and employment, as well as cost of inaction, should be underlined in the public awareness campaigns. In this respect, improving energy efficiency both at the industrial and the individual level should be promoted as a priority for climate change mitigation strategies. In this framework, local administrations and the NGOs have utmost importance and responsibilities in increasing public awareness, pushing the issue forward and helping the implementation of the decisions and measures. In this respect, capacity building of these entities should be improved.

Decisions and measures in promoting environmental friendly technologies would offer opportunities for new areas of investment for Turkish companies and also attract more foreign investment. Turkish government should support R&D activities for innovation and clean technologies while promoting energy savings and effective use and new, renewable energy technologies. For this purpose, research and research development activities should be supported. In addition to these, another research area would be the new development opportunities, business and employment possibilities created by the climate change adaptation activities.

Within the global climate regime, taking the necessary measures are also tools to modernize the industrial setting of Turkey while attracting foreign investment, securing the future energy needs of the country, improving the country's image in the international arena as well as transforming it as a European partner for the EU. In this framework, Turkey can deepen and strengthen cooperation with the EU towards full membership. Extensive coordination with the EU is critical in shaping future climate policies of Turkey. Hence, Turkey should formulate its climate strategies in parallel with the EU, which is already required as part of the Acquis. As an accession country, Turkey should find a common ground to join EU's "Burden Sharing" system and EU's Emissions Trading Scheme, which would bring considerable economic interest for Turkey.

In order to transform to the low-carbon economy, there is a need for an overall mental landscape transformation. Since climate policies are related to the various policy areas, such as energy, economy, industry, agriculture and tourism, various measures and reforms in this respect have the capacity of changing the overall outlook of the country. Actually, these measures are, in nature, necessary attempts for a strong, respectable and low-carbon Turkey, in way to the EU accession. The main precondition to achieve this is the active participation of Turkey in post-2012 global climate regime by providing reliable data, information and strategies to place the country in the right list in accordance to its national capacity and responsibilities.

VII. CONCLUSION

Numerous environmental problems have emerged in the last decades of the 20th century. These are the global commons problems since they belong to all human beings and have global impacts. Addressing environmental problems and climate change policies should have an integrated approach concerning energy policies, investment areas, foreign trade, local administrations, health, industrialization and regional development and consumer rights.

Addressing climate change requires protection of the atmosphere, which is a collective good that every nation and individual has access. Therefore, this requires international cooperation, which has been achieved to a certain extent since 1990s by the entrance into force of the UNFCCC in 1994. Establishing a basis for international efforts to addressing climate change, the UNFCCC aimed to reduce GHG emissions, nevertheless, it was not binding in nature, but rather an expression of political will. However, the scientific reports of the IPCC warned continuously that the climate is changing mainly due to human activities.

The level of priority attributed to climate change in many governments has risen gradually. Therefore, the Kyoto Protocol was adopted in 1997, but it could enter into force in 2005 due to the unwillingness of some countries, particularly the US. Sharing the main objectives of the UNFCCC, the Kyoto Protocol renamed developed country list of Annex I as Annex B and introduced further commitments in terms of individual, binding targets to limit or reduce GHG emissions. Up to today 186 countries and EC have ratified the Protocol, among those only Annex I parties[462] are committed to reduce GHG emissions below specific levels, a total cut of approximately 5% from 1990 levels by the 2008-2012 period.[463]

Total global GHG emissions have almost doubled since the early 1970s and another doubling is expected over the period 2008-2050, if no action is taken. The IPCC tries to estimate possible increases of total global GHG emissions and works on different scenarios, ranging from 1.1˚C to 6.4˚C by 2100. Climate change is projected to have severe consequences, including increase in water stress, serious effects on ecosystems and food security, and threats to life and property as a result of coastal flooding. IPCC warns that the poor regions are to be

[462] Annex I is composed of 37 industrialized countries and the European Community to reduce greenhouse gas (GHG) emissions
[463] See details at the UNFCC official web site available at http://unfccc.int

affected the first and the most. In this respect, the IPCC claims that in order to avoid severe impacts of climate change, the rise of global temperature should be limited by 2°C relative to pre-industrial levels by 2050, which requires reduction of GHG emissions by more than 50%. This requires a global effort with participation of all major emitters, mainly the US, as well as developing countries, particularly China and India.

There is an international consensus that the climate is changing due to human activities and has potentially high economic and welfare costs. Estimates of the economic costs of climate change vary widely. The Stern Review, one of the most reputable researches in this issue, warns that we can have permanent 14.4% loss in average world consumption per capita when both market and non-market impacts are included.[464] Moreover, climate change threatens development gains achieved so far, due to its impacts on health, food security and migration. On the other hand, the IPCC estimates that the cost of mitigation would not exceed 3% of global GDP in 2030. Moreover, the IPCC draws attention to the co-benefits of mitigation, such as lower emissions of GHGs would be accompanied by lower air pollution and increased energy security, agricultural output, and employment.

The world should achieve major transformation of the current economic systems to eradicate poverty, avoid the catastrophic impacts of climate change, and provide adequate energy services required for a sustainable world. Humanity has already exhausted the most of the world resources, and now faces ever biggest challenge of climate change. In order to tackle the climate change and ensure future prosperity, humanity needs to learn saving, being energy and material efficient, and achieving high level of growth based on low-carbon economies. Nevertheless, departure from traditional way of production, consumption and lifestyle is not easy so that can be achieved gradually with support of policies and measures.

Energy is one of the most important assets that will influence the shape of the societies in the future. The cost and availability of energy significantly impact the quality of life, future of national economies, relations between nations and stability of environment. On the one hand, energy is an essential motor of growth and development for increasing world population; on the other hand it is the main cause of GHG emissions and pollution. Ensuring secure, reliable, affordable, sustainable and clean supply of energy is essential for social and economic

[464] Nicholas Stern, "The Economics of Climate Change: The Stern Review", *op.cit.*p.45.

development. In this respect, in order to achieve the development goals, the poorest countries will need access to energy and improved energy services as means to enhance investment, develop industry and even provide education, health, clean water and other societal needs.[465]

Energy and climate change polices are a key areas of cooperation in our age that economic regions are dependent on each other for ensuring energy security, stable economic conditions and effective action addressing climate change. Ensuring sustainable, competitive, secure and clean energy is indispensable where world energy consumption is expected to rise by 60% in the next 25 years, which stimulates the global climate change. Since CO2 emissions is strongly linked to fossil fuel consumption, growing dependence of the scarcer and more expensive imported fossil fuels is likely to be much more costly than any of the proposed climate mitigation measures if fuel consumption is not reduced reasonably. Therefore, measures to reduce fossil fuel contribute to stabilize the climate and also serve to stabilize the economies, shielding them from the most negative effects of coming energy crisis. Energy efficiency promotes both competitiveness and protection of climate and security of supply.[466]

The scientific reports clearly prove that only efforts of limited numbers of developed countries under the Kyoto regime will not be enough in combat against climate change. The first commitment period of the Kyoto Protocol will expire by 2012. In this respect, there are efforts to enhance the global cooperation in order to set more concrete targets, measures and policies in the post-2012 climate regime. Especially the EU is eager to push the Kyoto Protocol further in post-2012 era and become a leader in climate change policies, but its international stance and power is questionized.

Accounting for about 10.5% of global emissions, the EU efforts alone will not be enough to mitigate climate change unless further action is taken globally. Although the EU leadership tries to push further the negotiations, global participation and solutions are essential for global climate change agreement after 2012 when the Kyoto commitments end. In this respect, the EU can contribute to tackle the "participation challenge" by encouraging the developed and developing countries to join together in creating a truly global strategy to combat the risks of climate change and to build political consensus on the way forward for international

[465] BIAC Background Paper for the International Ministerial Conference on *"Nuclear Power for the 21st Century"* Paris, 21 and 22 March 2005.
[466] Sustainable Energy News, Newsletter for INFORSE International Network for Sustainable Energy, No. 48, March 2005.

cooperation. In this respect, in post-2012 climate regime, the EU tries to involve all big emitters, particularly the USA, China, India and other large developing and advanced developing countries, which currently do not have reduction targets under Kyoto Protocol. Consequently, the EU needs to create a common and integrated policy out of the clashing national interests and disparities.

The urgency of the issue requires broader participation of developing and developed countries and enhanced cooperation. Nevertheless, economic challenges, lack of political will accompanied with the different levels of development, capacities and historical responsibilities create great obstacles for achieving broader participation and effective implementation. Therefore, the post-2012 climate regime should include new measures and tools for financial and technology problems.

Transfer to low-carbon and development of new technology are important tools for combat against global climate change. For an effective climate change policy in post-2012, it is essential to set proper mechanisms for financial and technical assistance of developed to developing countries. Hence, climate protection requires considerable investment and financial means so this should be achieved through cost-efficient policies. The real costs are incurred at the time of climate friendly investments while the associated policy benefits materialize in the medium and even in the long term. Environment and climate change policies are important for the industry due to its effects on the competitive power in national and international markets and environmentally friendly development.

The combat against climate change can be achieved in the long term with global participation, technological development, ongoing scientific research and flexibility among the national obligations, according to the capacities and responsibilities. In order to compensate high regional and national cost and capacity disparities, there is a need for burden-sharing mechanism for future international collaboration to reduce global emissions.

In order to achieve the integration of adaptation into development processes, several types of initiatives can be undertaken at the national level. It is vital to have comprehensive government approach, which involves key stakeholders, while improving coordination with existing mechanisms for disaster risk reduction and implementation of relevant multilateral and regional environmental agreements, and a review and adjustment of regulations and

standards to reflect climate change impacts. In addition, decision-making on adaptation should be based upon the best available information on the implications of both the current and future climate of the country. Therefore, the availability and quality of climate information needs to be improved constantly.

It is possible to incorporate the ability to implement projects in developing countries and transfer the technology to them in exchange for GHG credits. In addition, support for research and innovation are tools for effective long-term approaches for promoting development of technologies and production and consumption patterns with low carbon intensity. Within this context, it is vital to promote the overall mental transformation towards low carbon economy through raising awareness of the end-users in order to ensure participation and contribution of all sectors of society to climate protection.

Although the US has been rejecting the Kyoto Protocol for many decades, the new administration of President Obama introduced more comprehensive and positive approach to American and global climate and energy policies. In this respect, the Waxman-Markey Bill was developed and sent to the Senate in 2009. This Bill sets emission reduction target of 17% below 2005 levels by 2020. This means about 4% reduction below 1990 levels by 2020. Moreover, in the long term by 2050, the Bill targets 83% emission reduction below 2005, this in turn accounts 80% of reduction below 1990 levels.

Although being the pioneer of international climate regime, it can be claimed that the EU's energy and climate change policies were not sustainable yet since rapidly growing energy demand has two main consequences, namely import dependency and climate change. In order to tackle these problems and integrate the environmental considerations into the all sectors, the EU has been trying to develop sustainable policies to strengthen energy security, combat climate change and improve European competitiveness. For this end, in 2009, the EU launched a new European energy and climate policy that will transform Europe into a highly efficient and low CO2 energy economy. In this respect, Europe's new policy amounts to a new industrial revolution. For this purpose, the EU foresees, taking global action, making better use of new internal energy market, enhancing energy efficiency, increasing the use of renewable energy, developing technology, promoting EU energy solidarity, ensuring nuclear safety and security and keeping tabs on energy trends. Through this policy, the EU commits itself to reduce GHG emissions 20% from 1990 levels, increase renewable energy to 20% of

primary energy supply and increase energy efficiency 20% and increase biofuel in transport fuels in sustainable ways to 10% by 2020. The EU agreed to reduce GHG emissions 30% by 2020 relative to 1990 levels on the condition that other countries also commit to reductions.

The central pillar of the EU's climate change policy is transition to a low carbon economy through measures to mitigate emissions. Climate change is already occurring so that it is essential to couple climate policy based on mitigation with measures that are designed to effectively adapt to the unavoidable impacts of climate change. In this respect, the EU climate policy is integrated with the energy policy in a manner to promote measures for mitigation and adaptation.

Another challenge for Europe is the differentiated level of economic and industrial development of the EU member states, especially the new member states. Reducing emissions across many sectors requires a portfolio of policies tailored to fit specific national circumstances. In general, climate change policies will need to be adjusted over time as the risk and means to manage becomes clearer. The ambitious EU policies together with increasing attention of international community to climate policies increase the international pressure on Turkey as a country, which is involved in global climate policies rather late. Turkey has been a passive member of international climate regime for many decades, due to its misplacement in Annexes of the UNFCCC as a result of its lack of participation during formation it. As an OECD member, Turkey has been placed in the developed country lists of Annex I and Annex II of the UNFCCC, which impose 5% emission reduction commitment below 1990 by 2012. Nevertheless, Turkey rejected to be considered as developed country and did not ratify the UNFCCC until 2004 and the Kyoto Protocol until 2009, considering its rather lower level of economic and industrial development comparing to developed countries.

Turkey ratified the UNFCCC on 24 May 2004 as the 189th party country only after KP26/CP7 decision of the 7th Parties Conference (COP7) that is held in Marrakech in 2001. This decision invited all parties to consider the "special circumstances" of Turkey that will enable Turkey to be a Party in another position different from the Annex-1 countries. Nevertheless, this has been only an invitation to the parties, without defining the term of special circumstances so it is left as a vague concept or an "empty box". Turkey uses this decision as an argument for its position in the post-2012 climate regime, but Turkey would have a stronger hand if it would

have filled in this “empty box” by defining the special circumstances on the basis of reliable data, information and reduction strategy.

With around 73 million people, Turkey is one of the most densely populated countries in the world and has the fastest population growth rate within the all OECD countries. Besides the growing population and urbanization, Turkey’s energy demand increases in line with the economic growth and industrialization in the last decades. Hence, being dependent on all these factors, the total GHG emissions of Turkey increase rapidly, accounting 119% rise between 1990 and 2007. With 77% energy sector has the largest share within the total GHG emissions in 2007. Waste disposal and industry follow energy sector with share of 9% and 7% in the same year. On the other hand, according to the data of 2006, Turkey’s ratio of per capita CO2 emissions accounts 4.6 ton CO2 equivalent, which is under the global average of 7.5 ton and EU 27 level of 10.4 ton.

Turkey’s high rate of dependency on imported energy resources places a big burden on the economy and environment of the country. Mediterranean Basin is expected to be among one of the most affected regions by climate change impacts. Given that fact, Turkey needs to stimulate efforts for adaptation to climate change. Despite to its proximity to 70% of world energy resources, Turkey is highly dependent on imports for energy products, mainly the fossil fuels, which accelerate enormously the rise of GHG emissions in the country.

As a long standing candidate and accessing country to the EU, Turkey is closely linked to the European energy and climate change policies. In the process of the EU accession, Turkey has to adjust to the ever changing EU policy of energy and climate change. Nevertheless, Turkey’s level of industrialization and economic development, as well as the release of GHG emissions, are much lower than the EU member states. Hence, as a passive actor in the climate regime, Turkey has pressure to take developed country reduction commitment both from international community and the EU. Turkey expresses its willingness to take NAMAs with international support in funding and technology. Turkey declared that it can reduce emissions 11% below business-as-usual levels of 2020. Nevertheless, this target is far behind the EU’s ambitious targets and expectations of international community from Turkey. During the accession process, Turkey faces a challenge to comply with ambitious climate policy of the EU, which targets % 20 emission reductions below 1990 levels by 2020. During the EU accession negotiations Turkey may ask derogation in this respect.

Similar to the EU, Turkey also faces a great challenge to strengthen energy security, satisfy the growing energy demand while controlling the GHG emissions. Diversification of supply is one of the fundamental components in attaining security of supply so that geographical situation of Turkey can serve for this purpose. Hence, Turkey could be an ideal candidate to become East-West energy corridor for the diversification of energy resources as 73% of the crude oil and 72% of the natural gas reserves of the world lie in the Caspian, Middle Eastern regions and Russia, surrounding the country. However, so far Turkey could not enjoy this privileged position to turn into an advantage for itself and its relations with the EU, since the energy market liberalization constitutes a big obstacle in front of the energy security, efficiency and diversification of resources.

Considerable renewable energy resources and potential may contribute to environment or climate friendly energy policy and sustainable development in Turkey. Nevertheless, this would not be enough alone so it should be supported by an integrated energy and climate change policy in a sustainable manner while ensuring overall mental transformation in politics and public sphere. For this end, there is a need for cooperation and collaboration among government, industry and civil society.

Besides the differences between developed and developing countries in terms of economic and industrial development, Turkey draws attention to the different levels of economic development among Annex-I parties. Some non-Annex-I countries have levels of development higher than the OECD averages; on the other hand some of them have development levels lower than Non-Annex-I parties. Although Turkey is considered in the list of Annex I developed country, as an OECD member, its level of development is in line with most of non-Annex I countries. With respect to its rapidly growing population, energy demand, urbanization, industrialization, emission levels and relatively low amount of per capita emitted to the atmosphere as well as its GDP per capita, Turkey should be considered as an advanced developing country rather than developed country.

Neither the UNFCCC nor the Kyoto Protocol provides definition of developed and developing countries. Therefore, the post-2012 climate regime should define clearly the concepts of developed and developing country and should go one step further by introducing advanced developing country list. Many countries have been developing rapidly in the last

decades and releasing huge amounts of emissions, so that these countries may be considered as advanced developing countries. In this respect, Bali Action Plan used the terms “developed countries” and “developing countries” instead of referring to the Annexes.

The post-2012 climate regime, the official position of Turkey is that the commitments of Turkey should be based on equity and fairness while taking into consideration the “differentiated responsibilities” and “individual circumstances” of the parties. However, instead of following an ignorant and passive policy, Turkey should negotiate possible commitments reflecting different structure and capabilities of the economy and industry, while taking into account the level of development. Turkey believes that differentiation among developed parties on the basis of composite indicators is crucial in identifying future commitments or actions in terms of mitigation or technological and financial supports.

Adaptation is now recognized as an essential building block together with mitigation, technology, and finance in the design of a post-2012 global climate regime. In this respect, National Adaptation Strategies are prepared to protect and enhance the wellbeing of communities in the face of climate. Moreover, it provides technical guidance for developing and assessing climate change adaptation policies and measures. Hence, Turkey should develop urgently a National Adaptation Strategy, which will help to ensure that current opportunities are integrated into national planning processes. This Strategy should facilitate the mainstreaming of adaptation into Turkey’s national development strategy by reducing climate vulnerability through a bottom-up strategy-setting process. In line with the adaptation strategy, Turkey should also develop and implement a country-driven and comprehensive vulnerability assessment.

Insufficient funding, technology and lack of capacity hinder climate adaptation policies of Turkey. Moreover, in Turkey, there is lack of integration as well as coordination and cooperation between government ministries and departments. In addition, there is insufficient science, knowledge, and understanding of climate change projections, impacts, and potential adaptation options in the country. Funding for adaptation initiatives in Turkey is dramatically low taking into account the potential climate change hazards and threats. There is a need for capacity building and maintenance, stakeholder engagement, and strategic coordination among entities of Turkey.

One of the ways to tackle economic crisis and environmental crisis simultaneously is to transfer to a new sustainable production model of low carbon economy. Within this context, it is essential to develop and promote environmentally friendly production techniques and technologies. Turkey should also follow this path by means of sustainable economic, social and industrial development acceleration. Hence, by this way economic benefits will be gained by increasing the competitive power of the sectors while improving the life standards in the cleaner world. Taking the necessary steps to combat against climate change are also tools to modernize the industrial setting of Turkey, securing future energy needs, attracting foreign investment, improving the country's image and credibility in the international arena as well as transforming it as an attractive partner for the EU.

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