



# Emerging carbon markets and climate policy: A theoretical approach towards a global carbon market.

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## *Abstract*

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To mitigate climate change around the globe, carbon markets are the motivating and efficacious device. This device is mounting fast. The Durban Platform at the COP 17 was a great achievement since the establishment of UNFCCC in 1992. The Kyoto Protocol has been extended up to 2020 at the COP 18 in Doha. There will be a new future climate regime by 2015. Although there are several points to be frustrated, the opportunities are still high. More or less, both developed and developing countries are responding seriously at the domestic level albeit the key countries are out of the game in international level. The industries, firms and companies will necessarily be prepared for “carbon legislation” and will be carbon constrained those are not yet connected. Those have already been connected will be benefitted more. The major industries are including expected carbon prices that are necessary for ground-breaking and, at present, costly technology on the basis of their future strategic decisions. Theoretically, a strong “top-down” approach is mandatory along with voluntary “bottom-up” approaches. The new market mechanisms add a dimension to this. The potentials for shaping a global-level carbon markets are high and seems logical. The private sector financing will be a crying need. For that, a mutual cooperation is required between private sectors and government policy makers for seeing a greater picture.

*To my lovely family*

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## *Acronyms*

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KP	Kyoto Protocol
GHGs	Green House Gas Emissions
IPCC	Intergovernmental Panel on Climate Change
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
CPRS	Carbon Pollution Reduction Scheme
MRET	Mandatory Renewable Energy Target
CDM	Clean Development Mechanism
ETS	Emissions Trading System
EC	European Commission
EU	European Union
ACESA	American Clean Energy and Security Act
ACCCE	American Coalition for Clean Coal Energy
WCI	Western Climate Initiative
RGGI	Regional Greenhouse Gas Initiative
FYP	Five Year Plan
REDD	Reduction Emissions from Deforestation and Forest Degradation
NAMAs	Nationally Appropriate Mitigation Actions



## *Acronyms*

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EUA	EU Emissions Allowance
CER	Certified emissions Reduction
ZEP	Zero Emissions Fuel Power Plants
CCS	Carbon Capture and Storage
ICAO	International Civil Aviation Organization

## *1. Introduction*

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### **1.1 An overview of the research**

A central and existing debate in the arena of climate change and policy is about the potentiality of a global carbon market. To response to limit the high emissions of carbon in the sky, a harmonized policy is the call of the time for mitigating the worst effects of climate change.

As we know, change is the pattern of nature, climate also changes. It changes both naturally and unnaturally. Unnatural change occurs by human being. Human being emits carbon dioxide (CO<sub>2</sub>) and other green house gases (GHGs). Over the last hundred years this human-emitted CO<sub>2</sub> and GHGs mounted up in the atmosphere. It happened mainly by the hasty industrialization, towering business growth and advancement of science and technology. As a result, there was an urgent need to shape a treaty as a measure for reducing emissions of GHGs on a global level. Kyoto Protocol (KP) under United Nations Framework Convention on Climate Change (UNFCCC) is such a treaty.

However, there has always been a significant lack of transparency in the years long regarding the transliteration of the Kyoto Protocol (KP) which is the obligatory

global treaty by international law. The first commitment period of KP was expired at the end of 2012 and extended up to 2020 for the second period at the COP 18 in Doha. Due to the lack of an active presence of international community, nations and local authorities initiated a “bottom-up” approach to build up “low carbon strategy” by themselves. There has been a significant achievement since the creation of United Nations Framework Convention on Climate Change (UNFCCC) in 1992. All the countries including developed and developing agreed upon a global climate agreement when the historical Durban Platform was signed in 2011. The range, capacity and targets of the Platform are not defined even after the COP 18 (see box 5.1a) as the continuing negotiations is accord on the new future climate scheme by 2015 that will be applied to all parties from 2020 only.<sup>1</sup>

Though there are several failures of The Kyoto Protocol and carbon markets because of low price of carbon, undecided negotiations and lack of global agreement, this research sees a global requirement for the businesses to be careful and recognize the markets, especially its developments at the domestic level, will extensively affect the private sectors.<sup>2</sup> We see industries are taking benefits, up to the present time, from the existing carbon markets through a flexible mechanism for instance Clean Development Mechanism (CDM).<sup>3</sup> From the negotiations at the Durban Platform, we are now described several number of new market

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<sup>1</sup> Please See more about the critical discussion on the issue - Ernst and Young (2012): ‘Into the Unknown: climate change post Durban’

<sup>2</sup> To get more please see Ernst and Young (2012): How do companies do business in a carbon constrained world: investment decision and bottom lines’

<sup>3</sup> See box 1

mechanisms are planned to execute (e.g. NAMAS, Sectoral mechanisms) that may give new opportunities for business, as these are also part of our intended global carbon markets.<sup>4</sup>

This research historically, practically and theoretically discusses the evolution of the carbon market, comparative carbon markets, current carbon markets, emerging and potential carbon markets, carbon markets before 2020, carbon markets after 2020, potential business opportunities in the carbon market and finally the potentiality of compatible global carbon markets.

## **1.2 Definition and identifying research problem**

Climatologists and scientific analysis convey palpably and stalwartly the seriousness of climate change. They, recurrently tell us to lessen the CO<sub>2</sub> and GHGs to safeguard the mitigation of climate change. Constant emission of CO<sub>2</sub> and GHGs around the world will impact (are impacting) on economy, society and severely on ecosystem that is irremediable. The world will experience a high temperature that will increase and cause many other related problems. These problems will impinge on all parts of the world.

Now, the accomplishments are indispensable. Efforts are requisite from advanced industrialist countries to emerging economies. There are many actions and plans have been discussed over the years in the international courtyard. Outcomes are

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<sup>4</sup> See table 5.3a

still very slow that we discussed before and will discuss extensively later in this research. Revitalizing steps towards research and developments in the technological teamwork, safeguarding natural forests and tackling deforestation, adjustment policies for the poor countries and most significantly the efficient Emission Trading Systems (ETS) are crucial need.

Efficiency in the emission trading is a key question. There are invasive market imperfections in the energy and related markets which are affecting the efficiency of given policy instrument<sup>5</sup>. As, also, Nicholas Stern states, to have imperfections in the markets for exhaustible resources and energy could have considerable interactions with carbon-pricing that should also be considered, as he uttered, to pick the benefits of emission trading, deep and liquid markets and well designed rules are important<sup>6</sup>. It clearly indicates a well established carbon market that will work globally and it will effectively contribute to the global abatement of emissions. The above discussion gives a latent motivation of this research and identifies its research problem about related to global carbon market. More specifically asks; will there be a compatible global carbon market? To go into deep and details of the carbon emissions trading, this research also wants to know, what is the future of the carbon markets? How will it look like? What is the potentiality for the private

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<sup>5</sup> Blyth, w. & K. Hamilton (2006): 'Aligning Climate and Energy Policy: Creating incentives to invest in low carbon technologies in the context of linked markets for fossil fuel, electricity and carbon,' Energy, Environment and development Programme, Royal Institute of International Affairs, April 21 2006, London.

<sup>6</sup> N. Stern (2007): 'The Economics of Climate Change: The Stern Review', Cambridge University Press : 361-375 (bk)

sectors in this market mechanism? We try to answer these questions in a theoretical framework.

## *2. International agreements and emergence of carbon market*

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### **2.1 The background**

The history of known GHGs effect is not so old. People knew about it in the late nineteenth century from the chemist Savante Arrhenius but it did not become imperative. In 1896, he nominated the existence of the GHG in the atmosphere. Then it took hundred years to build an essential scientific inquiry about it<sup>7</sup>. Perhaps the urgency of identifying the GHG became visible because of other related issues like Ozone (O3) layer depletion, climate change, loss in the biodiversity. Especially, climate change moved into the notice of the people. Therefore, popularly we knew about the 'Global warming' that is human-made climate change caused by particular gases called carbon dioxide and methane in the atmosphere. These gases

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<sup>7</sup> Rodhe, R. Charlson, and E. Crawford, 'savant Arrhenius and the green house effect', *Ambio* 26 (1997): 2-5

stuck in for a long years and they allow the sunlight to come in but not out going. Thus the temperature of the earth's surface rises. The constant amplification of GHG affects global temperature and change rainfall (precipitation) and storm characteristics in less conventional ways. It is difficult to experience these changes of temperature in a daily basis but the changes temperature between last ice ages and present time is more than 8 degrees<sup>8</sup>. The Intergovernmental Panel on Climate Change (IPCC) approximated a global warming between 1.4-5.8 degrees Celsius by 21<sup>st</sup> century.<sup>9</sup>

Noticeable disagreements came to the international politics about climate change. There is an evident relationship between GHGs and global economy that will be clarified in our discussion in details. GHGs emission, still, caused mainly because of primary energy resource fossil fuels that is almost inescapable for the industries. On the contrary, these GHGs accumulated in the atmosphere will change the global climate fiercely. Moreover, because of these highly controversial political issues, the climate change science report also has been questioned<sup>10</sup>.

Slowly the issues regarding climate change become more vital. In 1992, UN Conference on Environment and Development in Rio de Janeiro (informally known

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<sup>8</sup> N. E. Hultman (2004): 'Emerging carbon market and future of climate policy', *George Town Journal of international affairs. (journals)*:124

<sup>9</sup>See reports on the science of climate change at [http:// www.ipcc.ch](http://www.ipcc.ch). (reports)

<sup>10</sup> P. N. Edwards and S. H. Schneider (2001): 'Self-Governance and peer review in science-for-policy: the case of the IPCC second assessment report' in *Changing the Atmosphere: Expert Knowledge and Environmental Governance*. eds C. A. Miller and P.N. Edwards ( Cambridge: MIT press,2001), 219-246 (reports)

as Earth Summit), climate change has been contextualized both legally and internationally. Most importantly, The UN Framework Convention on Climate Change (UNFCCC) that is an international environmental treaty bargained with *an* objective to "stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."<sup>11</sup>

The matter to look at here that the treaty sets a non-binding targets on greenhouse gas emissions for the countries and incorporates no enforcement or socio-political control mechanisms. It makes the treaty legally non-binding that put an objective for the advanced industrial countries to lessen the emissions to '1990 levels by 2000'. UNFCCC also fashioned a system of national reporting and expected party meetings on a regular basis for shaping key commitments in future<sup>12</sup>. By signing (not ratified) this agreement, the USA agreed that countries have "common but differentiated responsibilities" to avert "dangerous interference with the climate."<sup>13</sup> Until the Kyoto Protocol in 1997, the countries contested this very idea of commitments for the five years.

Then, logically, International agreements became very practical. To come to that path, IPCC developed by UN Environment Program (UNEP) and World

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<sup>11</sup> 'Article 2', *The United Nations Framework Convention on Climate Change*. Retrieved 15 November 2005 (Article)

<sup>12</sup> S. H. Schneider, ' Kyoto protocol: the unfinished agenda- an editorial essay', *Climate change* 39 (1998): 1-21

<sup>13</sup> Text of UNFCCC [http:// unfccc.int](http://unfccc.int).



Meteorological Organization (WMO) achieved countries trust and indicated for scientific inquiries and answer to them. Consequently, a planned and good policy on climate change will hearten innovation while initiating an unassuming constraint on emissions in the near term that increasingly constrict over the time-consuming period.

## **2.2 The Kyoto Protocol and the characteristics of carbon markets**

The Kyoto Protocol, this time, fixed obligatory obligations on developed countries to decrease emissions of GHGs which 191 countries ratified but the USA and Canada withdrew from it in 2011. It also set the facility of states whose emission falls lower than their limit to sell this “allowances” to other states. The states who failed to fulfill their target can buy them. This kind of market-based initiatives called “cap-and-trade” was established in the USA. For the decrease of regional air pollutants like sulfur dioxide (SO<sub>2</sub>) is still used there. Another contribution to this development is considered that the involvement of GHGs to climate change can be approximated based on laboratory experiment and also knowledge of how gases act in the earth atmospheric system. Similarly, a certain amount of GHGs can be exchanged to the equivalent emission of carbon dioxide through basic conversion

factors namely "global warming potentials". Thus, this basic unit of decrease has been articulated as the "CO<sub>2</sub> equivalent" or CO<sub>2</sub> e.<sup>14</sup>

Binding targets for the developed countries were expected but at least the starting towards the greater step. Still problems were there. Exclusion of developing countries from the binding targets made the political situations controversial. There were many reasons behind this e.g. historical debt, equity etc. Though the USA, de facto, pulled out from the field, many other countries agreed to the international emissions trading criteria and regulations for applying Kyoto. As a result, preliminary trade barriers were removed from the market workings. Multi actors like "broker-traders, insurers and credit generators" started joining these fields; they sketched new products to pull into the market.<sup>15</sup>

The emission market emerged (though it tolerated many condemnations). It emerged with some future plans and agendas. Significantly, the European Commission endorsed a set of obligatory proposals for starting emission trading all over the EU Countries in 2005. Later it shaped the greatest emission trading system all over the world and placed a process of standardization in other countries that has been synchronized with the regulations of UN climate agreements.<sup>16</sup> However, Denmark also designed compulsory line up casing electricity generation sector.

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<sup>14</sup> N. E. Hultman (2004): 'Emerging carbon market and future of climate policy', *George Town Journal of international affairs. (journals)*: 125

<sup>15</sup> N. E. Hultman (2004): 'Emerging carbon market and future of climate policy', *George Town Journal of international affairs. (journals)*: 126

<sup>16</sup> EU emission trading system [http:// europa.eu.int/comm./environment/climate/emission.htm](http://europa.eu.int/comm./environment/climate/emission.htm).

Moreover, at the beginning of 2002 the United Kingdom implemented “multi-sector trading plan”. British petroleum is one of the actors of who initiated a domestic trading system with a big advice-giving role in outlining mutually the Kyoto and UK emissions trading rules.<sup>17</sup> Despite the lack of unawareness of the United States, many corporations espoused domestic targets.<sup>18</sup> Most Importantly, Chicago Climate Exchange took care of companies in respect of organizing promises and dedication creating a platform for the trade in the purpose of a leading market position. World Bank’s Prototype Carbon Fund and the Dutch Erupt Program are also in the field to work vigorously to lessen the risks in carbon investment by catalyzing markets.<sup>19</sup> Then, noticeably, US states especially, California, New York and Massachusetts started to standardize green house gas emissions. The more information also given later on this particular discussion as it is highly related to the core of our research.

Gradually, emission trading begun to be popular. It speeded up the carbon market. Being matured slowly and growing degree of trade in carbon assets, the market started to contribute to the “permit price ranges” maturely. The brokers were holding the transaction mechanism and the defrayal prices were protected strongly

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<sup>17</sup> Mark Akhurst, Jeff Morgheim, and Rachel Lews (2003) : ‘ Greenhouse gas emission trading in BP,’ Energy Policy 7: 657-663

<sup>18</sup> Michael Margolick, and Doug Russel (2001): ‘ Corporate greenhouse gas reduction targets’, Arlington, VA: Pew center on Global Climate Change:74

<sup>19</sup> Frank Lecocq (2003): ‘Pioneering transactions, catalyzing markets, and building capacity: The prototype carbon fund contributions to climate policies’, American Journal of agricultural Economics 85. no 3: 703-707

and closely. Without a transparent and well-visible exchange as well as publications of a number of trades, it was complicated and tentative to evaluate the carbon prices. Even so, many research groups accumulated data on brokered trades during 2002.<sup>20</sup> In various carbon catalyst websites, prices and transactions were found. Profoundly, these available data started to project an image of developing market for carbon diminution.<sup>21</sup>

To discuss elaborately, there is another difference that can be characterized by that firms obtain permits voluntarily and permits are obligatory when those firms have to perform by law. Firms bought the voluntary reductions for some certain reasons. Sometimes they do it for creating or increasing image and reputation. Sometimes they may think they can use these credits when the 'legal regime' will be created. That is why this is popularly called 'pre-regulatory' or 'pre-compliance' reductions as was the case with the UK and Denmark before establishing compliance system and still form of trade of the greenhouse gas asset for the US firms, perhaps, due to the low cost of per ton carbon dioxide equivalent (CO<sub>2</sub>e).<sup>22</sup>

On the other hand compliance allowances those firms obligatory are holding are guided by the law of the certain national body (UK) or a supranational one (EU). The

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<sup>20</sup> Richard Rosenzweig, matthew varilek, and Josef Janssen (2002) : ' the emerging international greenhouse gas market' Arlington, VA, Pew center on global climate change: 64 ; Franck Lecocq, and karan Capoor ( 2002) ' states and trends of Carbon Market' : Washington D.C.: World Bank PCF Plus Research Group

<sup>21</sup> Please for mo data on <http://www.pointcarbon.com> and [www.co2e.com](http://www.co2e.com).

<sup>22</sup> N. E. Hultman (2004): 'Emerging carbon market and future of climate policy', George Town Journal of international affairs. (journals): 127

Compliance allowances and non-compliance allowances are sharply divided by a notion of quality of the credit in the market price that is related to degree of certification, regulatory status and reliability of the reductions.<sup>23</sup> It is very significant to notice that the transformation of carbon market from illiquid and immature status to a liquid and mature status. However, Hultman points out, the prices of carbon in the market were a function of random emissions cap rather than any particular measurement of social value of carbon reduction when the industries were thinking how much carbon risk they are exposed to.<sup>24</sup> Increase number of compliance units, the number of trades and “risk-mitigating contract provisions including options and alternate payment structures”<sup>25</sup> are the progress of carbon markets those are accelerating the speed.

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<sup>23</sup> Michael Molitor, Laurent Segalen and Kristian Rajakaltio (2003) : ‘The prices of carbon’, Environmental Finance.

<sup>24</sup> N. E. Hultman (2004): ‘Emerging carbon market and future of climate policy’, George Town Journal of international affairs. (journals): 128

<sup>25</sup> N. E. Hultman (2004): ‘Emerging carbon market and future of climate policy’, George Town Journal of international affairs. (journals): 128

### ***3. The battles of political economy: approaches towards emission trading systems***

There is always been a discussion about different approaches to lessen CO<sub>2</sub> and GHGs at a certain level. Because of considerable distributional cost and consequences, these approaches or mechanisms end up creating two poles – ‘winners’ and ‘losers’. To alleviate atmospheric levels of carbon dioxide at 550 ppm or less is equal to hundreds of billions of dollars for each year in the coming 50 years.<sup>26</sup> Though it is not latest, the political battle is about how these sources and resources are collected and allotted. In respect of gaining and losing debate due to the regulations cost, it is clear to identify the two poles. To safeguard the environmental policies and also to diminish the economic coverage regulatory politics seems to crater a group against another.<sup>27</sup>

Over the years many designs have been discussed and schemes are taken into consideration. Market based policy is a kind of new approach to deal with the carbon emission. Comparing the other approaches this one looks more effecting. The evolution of trading system and design of it also bears the costs but its impact

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<sup>26</sup> A. Denny Ellerman and Paul L. Joskow (2008), ‘ The European Union’s emission trading system in perspective ( Arlington, VA: Pew center of global climate change: 39

<sup>27</sup> T. J. Lowi (1964) : ‘ American business, public policy, case studies, and political theory, in world politics’ 16(4): 677-715 (article)

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is still bona fide. Looking at various prevailing and emerging 'emissions trading regimes', especially in the EU, Australia and the USA replicates political and economic "deals" striking in the respective countries and regions reproducing the results of political conciliations that disperse to different stake holders in economy both the cost and rents of an exacting carbon lessening policy.<sup>28</sup>

The scholars have discussed with a specific identification of market-based initiatives. The specificity shows these approaches have two forms. First one is based on changing comparative price levels of products, mainly, through taxation. Second one exclusively talks about the property rights. A taxation process increases the price level for dispiriting the products and services related to carbon intensity and to set up a mechanism that implies price pointers in the economy to decrease the level of carbon intensity of an economy. Otherwise of this mechanism is to provide property rights to the market partakers over carbon dioxide emissions.<sup>29</sup>

Talking about the property rights, the notion behind this approach is to allow the entities that have been given property rights to a certain degree of emissions. They also have the emission units unused to sell this surplus facility to those entities who have surpassed their targets. What we see is a new mechanism created a new commodity that itself is created in the form of diminution or exclusion.<sup>30</sup> This is

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<sup>28</sup> T. Behr and J Martin with W. Hoxtell and J. Manzer : ' Towards a global market? Potentials and limitations of carbon market integration': GPPI Policy Paper No.5: 10

<sup>29</sup> T. Behr and J Martin with W. Hoxtell and J. Manzer : ' Towards a global market? Potentials and limitations of carbon market integration': GPPI Policy Paper No.5: 11

<sup>30</sup> UNFCC : 'Emissions Trading': [http://unfccc.int/Kyoto\\_protocol/mechanisms/emissions\\_trading/items/2731.php](http://unfccc.int/Kyoto_protocol/mechanisms/emissions_trading/items/2731.php)

competent and professional innovation to the approach of CO<sub>2</sub> emissions diminution. Logically, this system works with cost and benefit process as credit transfer of emission trading takes place from one to another. It happens because entities find dissimilar costs for decreasing emissions. Industries possessing the “low-emitting technologies” have lower cost and easily save some credits and sell them to the industries having relatively high-emitting technologies. By the stipulation of financial enticement for managing emissions and the elasticity to determine how and when emissions will be diminished, the capped level of emissions is attained; theoretically, in a way that lessens by and large costs of program.<sup>31</sup> Primary works on emission trading (1980s) and the initial function of cap-and-trade systems, exclusively, a mechanism to shrink sulfur dioxide emissions (an element causes “acid rain phenomenon”<sup>32</sup> in the atmosphere) were mostly done in the US.

At the very primary stage the emission trading system might attribute four aspects<sup>33</sup>. First one is a cap where the capable power like government requires setting by and large limit on emissions for a specified time and this cap is the amount of all permitted emissions from all individual groups roofed by cap-and-trade format. Then, second one is the allotment of allowances as we discussed earlier. After setting on the whole cap, it requires to sparse into entity allowances

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<sup>31</sup> Ibid

<sup>32</sup> R. K. Raufer and Stephen L. Feldman (1987): ‘ Acid rain and emissions trading : Implementing market approach to pollution control: London : Rowman and Littlefield

<sup>33</sup> T. Behr and J Martin with W. Hoxtell and J. Manzer : ‘ Towards a global market? Potentials and limitations of carbon market integration’: GPPi Policy Paper No.5: 11



that is issued by a proficient authority. Every allowance permits the discharge of a particular quantity of GHG emissions, as we also pointed out; specified amount of GHGs is identified by the average unit of measurement which is single ton of carbon dioxide equivalent (CO<sub>2</sub>e). However, third aspect is the capacity to trade where proficient authority requires creating the fundamental market infrastructure to smooth the progress of trade among the issued allowances. Lastly, there should be punishments for non-compliance.

After the deep look and discussion of details of emission trading system, it may seem that is in a straight line but its execution brings some technical barriers. These barriers are considerable enough to take into account. The scholars call these barriers and needs "Challenges" of carbon market. The challenges are, firstly, the credibility of data to verify emissions cap. Secondly, inevitability of keeping balances between efficiency in expenses and environmental goals. Thirdly, there is a need for accessibility and easiness of use of properly functioning "trading infrastructure with monitoring and verification protocols and procedures."<sup>34</sup> Fourthly, necessity of connecting other systems like flexibility mechanism as characterized under Kyoto protocol. To boost the carbon market, it is prioritized to build an efficient regulatory mechanism by the expert agent. Moreover effectual, transparent and skilled market environment is mandatory, especially when large financial matters are concerned.

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<sup>34</sup> T. Behr and J Martin with W. Hoxtell and J. Manzer : ' Towards a global market? Potentials and limitations of carbon market integration': GPPi Policy Paper No.5: 11

Now, we have reached in a point that reveals the mechanism of carbon market along with its technical challenges. However, the complexities are on the way to reshape an effectual market based system. The vital challenges of this market are the political challenges and complexities. Considering the regular market mechanism and understanding the basic demand and supply rules carbon market is not similar and standardized where demand is “natural”. We catch it very clearly that the demand we talk about in the carbon market is unnaturally formed. It is done so by transferring property rights to the emission allowances. As we know, in the market, prices fluctuate on the basis of scarcity.

To discuss broadly, in our existing system of carbon market, the price relies on the amount of emissions rights distributed from the authority. As a result, counting the total shape and size of total cap assigned on emissions and also the whole apparatus considering the formation, construction and fruition of carbon market depend on the political choice, result and decisions where authority or decision makers technically controls the price in the field. So, Policy makers ascertain the pace and extent of “decarburization” of the certain defined economy. Moreover, in an industrial sector of emission trading by providing the regulation and putting cap, these same policy makers control and define the distribution of the “costs and benefits” of carbon extenuation over the economy. Now, we can easily perceive the emissions trading that is shaped and designed by the noteworthy conflict and argument around the allocation outcomes of the market plan. These aftermaths of

the allocation disputes supposed to influence the overall formation of emission trading.

On the basis of our previous discussion, to reap the benefit out of the prevailing system and to bring out the result on the ground level, the huge amount of allotment of emission in an economy is essential. The emissions trading is connected with a political and policy frame that lumbers the quantity of installations addressed by the system should got the most out of it. For that particular reason the more concentration is necessary on the sectors like “energy-intensive” area. Most significantly, the evenhandedness and usefulness should be cared of more by implementing the equal actions and procedures on the areas those are roofed and those are not enclosed.

The business areas and industry sectors those are under the scheme they may come to vestibule solidly to pressure hard to be excused. They will also request and raise for reparation, especially, those companies who are experiencing stiff competition from industries in command without the analogous carbon restriction and that locate it hard to forward the excess expense of carbon as a reason for price heights in their markets are synchronized. Then another important side to discuss along with the above discussion on the resolution making on the certain system exposure and reparation format is means of allowance circulation.

There is a clear hint on the issues discussed that the apparatus for allowance distribution greatly involves the allotment of expenses of assembling environmental

aims over various industries.<sup>35</sup> Considering the competence and environmental usefulness, knowledge of different trading establishments as well as economic theory clearly implies that auctioning is the best enviable device when the proposed liberated allocation of allowances disagree their case depending on previous use and also the position to the jeopardy or creating “politically standard” investments especially in the energy driven sectors. The existing dispute is that the “right to emit” is a previous use demand which merely cannot release by a new-fangled policy when the previous right to emit also incorporated enduring investment in highly emitted technology like coal-fired power plants.<sup>36</sup> Yet the allotment of allowances created a great political debate revealing the classic “rent-seeking game” where, as we know, particular interest groups struggle to transfer the load of emission trading scheme to other sectors in the certain economy. Therefore the venture and hazards are considerable. Extra profit ensues to the groups who successfully gained the free or liberated allowances and successfully exceed on the additional cost of carbon to the existing market.

As we know, in a deregulated market overall mechanism will not exceed on the basis of particular cost of allowances to targeted consumers which under free and liberated allocation will be zero. Moreover, particular cost of allowances will price in the opportunity cost of those allowances for instance the particular value of the

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<sup>35</sup> See OECD (2002), “Towards international Emission trading : Design implications for linkages” (Paris:OECD)

<sup>36</sup> A. Denny Ellerman and Paul Joskow (2008): The European Union’s Emission trading system in Perspective: p.39

allowances could easily be put up for sale on the emission market and on the other hand for the groups not capable to pass on that very opportunity cost for instance enclosed installation or mechanisms operating with synchronized price in the market or outside competition that does not contact same emissions decrease mechanism when carbon trading, at any rate, is "cost-neutral". In difference to that auctioning put straight and instant costs on enclosed installations when not total of which can be deducted by passing on expenses to consumers.<sup>37</sup> It does not make differences the distributions have been provided for free or auctioned off until the excess cost of carbon is properly reflected in prices and in that way puts the expected incentives for investments in low-carbon technology that will make the emissions trading scheme skillful.<sup>38</sup>

Then we observe in the venture credits rendered by Clean Development Mechanism (CDM) when it permits the participants to buy emission diminutions in other countries at a level of low price, offsets became very popular to the members and contributors in the market as they have assured to minimize their reduction cost. Telling it the most useful mitigation option, offset advocates implied that such systems start a price control mechanism that eventually helps to soft out "boom and bust" periods of carbon markets. However, critics like Michael W. Wara and Victor (2008) have opposite views when they emphasize on the issue of the

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<sup>37</sup> See T. Behr and J Martin with W. Hoxtell and J. Manzer : ' Towards a global market? Potentials and limitations of carbon market integration': GPPI Policy Paper No.5: 13

<sup>38</sup> S. Tilford (2008): How to make the EUemissions trading system a success : Centre of European Reform, Brussels:p21

engagement of developing countries and critics also state that offsets are a weak response to price shocks.<sup>39</sup> There are other political economic conflicts also dealing with the issue (e.g. “price safety valve” planning).

### **3.1 Comparative viewpoints of the carbon markets**

In recent years many countries have developed and designed the institution of compulsory carbon markets on the basis of similar ground but in different approaches. They vary in a manner where they outlined distinct political economic mechanism. The prevailing markets in the various regions particularly in EU, the USA and Australia experienced different cap obligatory on carbon emission those fluctuate clearly by the allocation of costs and benefits in their respective economy. These countries are significantly distinguished for getting the broader understanding of the emerging carbon market and climate policy.

According to the table 1 and 2, we observe the various regimes those differ on the targets, market mechanism and also basic ground of differences of political-economic disputes that contribute to the design characteristics of the overall emission trading system.

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<sup>39</sup> On a Working paper called ‘A Realistic policy on international Carbon Offsets. : Working Paper: 74, April. 2008, p.8

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Table 3.1a comparative view of carbon market

	<b>European Union 27</b>	<b>United States</b>	<b>Australia</b>	<b>New Zealand</b>
<b>1 Measure</b>	EU ETS <sup>1</sup> Phase III, 2013–20	Waxman-Markey draft bill	Carbon Pollution Reduction Scheme <sup>2</sup>	ETS <sup>3</sup>
<b>2 Scope, industry sectors</b>	<ul style="list-style-type: none"> <li>• 1.97 GtCO<sub>2</sub>e<sup>4</sup> in 2013<sup>5</sup></li> <li>• Power, industry, aviation, covering ~50% of total emissions</li> </ul>	<ul style="list-style-type: none"> <li>• 4.80 GtCO<sub>2</sub>e in 2012</li> <li>• 85% of all emissions (68% in 2012, with further sectors added in 2014 and 2016)</li> </ul>	<ul style="list-style-type: none"> <li>• -0.45 GtCO<sub>2</sub>e in 2011</li> <li>• 75% of total emissions (1,000 largest emitters across sectors)</li> <li>• Agriculture excluded</li> </ul>	<ul style="list-style-type: none"> <li>• 0.08 GtCO<sub>2</sub>e</li> <li>• All sectors (100% of emissions) by 2013</li> </ul>
<b>3 Baseline and target setting</b>	<ul style="list-style-type: none"> <li>• 21% below 2005 levels by 2020</li> </ul>	<ul style="list-style-type: none"> <li>• On a 2005 base: 3% reduction by 2012, 17% by 2020, 42% by 2030, 83% by 2050</li> </ul>	<ul style="list-style-type: none"> <li>• 5–15% below 2000 levels by 2020</li> <li>• 60% below 2000 levels by 2050</li> </ul>	<ul style="list-style-type: none"> <li>• 1990 level in 2012 (0.06 Gt)</li> <li>• Beyond 2012 as agreed in COP 11<sup>6</sup></li> </ul>
<b>4 Method for allocating permits</b>	<ul style="list-style-type: none"> <li>• 100% auctioning in power from 2013, rest will move to 100% by 2020 in calibrated way</li> </ul>	<ul style="list-style-type: none"> <li>• 15% auctioning in first year, more thereafter</li> </ul>	<ul style="list-style-type: none"> <li>• Proposal favors auctioning</li> </ul>	<ul style="list-style-type: none"> <li>• Grandfathering under a national plan</li> </ul>
<b>5 Offsets</b>	<ul style="list-style-type: none"> <li>• CDM<sup>7</sup> and JI<sup>8</sup> offsets allowed</li> <li>• Supply capped at 1.6 Gt CERS from 2008–20</li> </ul>	<ul style="list-style-type: none"> <li>• 1 Gt of domestic and 1 Gt of international offsets allowed per year, with some minor variances</li> </ul>	<ul style="list-style-type: none"> <li>• No limits on use of CDM and JI</li> <li>• Domestic offsets allowed from non-covered sectors</li> </ul>	<ul style="list-style-type: none"> <li>• No limits on use of CDM and JI</li> </ul>

<sup>1</sup>European Union Emissions Trading Scheme.

<sup>2</sup>A cap-and-trade scheme.

<sup>3</sup>Emissions Trading Scheme. The proposal is under review by the newly elected government.

<sup>4</sup>Metric gigatons of carbon dioxide equivalent.

<sup>5</sup>From existing installations.

<sup>6</sup>Conference of the Parties to the United Nations Framework on Climate Change (more usually called the Kyoto Protocol).

<sup>7</sup>Clean development mechanism, one of three flexibility mechanisms specified by the Kyoto Protocol.

<sup>8</sup>Joint implementation, another flexibility mechanism allowed under Kyoto Protocol.

Source: carbon point/mckinsey

Tables 3.1a and 3.2a show more concretely the differences prevail in the existing targets, mechanism, methods for allocation permits and offsets including New Zealand. Looking at the scope industry sectors the variations become more vivid and clearly give a notion the different but intensifying approaches are the need for the better outcomes of the reduction process.

### 3.2 European emission trading system

Considerably recent but highly growing emission trading system developed among the European countries are more spreading and surprising in compare to the USA and Australian emission trading regimes. The evolution of European emission trading system has substantial economic and allowance insinuation though there we see some arguments and debates when it initiated business in 2005 with its crucial political skirmishes over the allocation of costs. Basically the disputes started regarding the certain issues (e.g. "Burden –sharing") between European Commission and member countries around the NAPs (National Allocation Plans). Looking at the first phase of the emission trading, they have achieved a lot. Without just procrastination and speaking bombastic speeches they just started and with some flexibility on the issues they were successful in creating a market and able to find the primary mistakes very early.

Table 3.2a designed Compulsory emissions trading systems<sup>40</sup>

	EU ETS	Australia Status: June 2009	US-ACESA Status: June 2009	Us-Lieberman-Warner Status: June 2009
Launch Date	2005	2011	2012	2012

<sup>40</sup> See GPPI Policy paper no.5



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Sector Coverage	Power generation, oil refineries, coke ovens, metal production and processing, cement glass, ceramic producers, timber and paper products. ~46% of emissions	Power generation , transport, industrial processes, waste and forestry sectors 75% of total emissions	Electric power industrial and transportation sectors 85% of total Us emissions	Electric power, industrial, and transportation sectors- 82% of total us emissions
Cap target 2020	20% reduction based on 1990 levels(or 30% by 2020 if an international deal is reached	5-15% reduction based on 2000 levels(or 25% if an international deal is reached	17% reduction based on 2005 levels	15 reduction based on 2005 levels
Cap target 2030	30% reduction based on 1990 levels, if an international deal is reached	30% reduction based on 2000 levels	42% reduction based on 2005 levels	39% reduction based on 2005 levels
Cap target 2050	60%-80% reduction based on 1990 levels	60%-80% reduction based on 2000 levels	83% reduction based on 2005 levels	70% reduction based on 2005 levels
	Free allocation:	Free allocation:	Free allocation	Free allocation

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Allocation Mode	95% in trading period 1 90% in trading period2 Auctioning: <5% in trading period1 <10% in trading period1	~25% at launch Auctioning: ~75% at launch	85% at launch, slowly reducing towards full auctioning Auctioning: 15% at launch, slowly increasing to 100%	73.5% Steadily declining to 30.05% by 2031 Auctioning: 26.5% and steadily rising to 69.5% by 2031
Offset provision	Total offsets (domestic and International) set to 3-4%	Unlimited access to international carbon credits through CDM and JI	Total offsets(domestic and International) limited to roughly 33% of the cap at launch	Total offsets (domestic and international) limited to 30% of the cap at launch

Source: GPPI

Most importantly, the whole environmental and climate change issues became a great matter of attention to the policy makers and because of environmental advocacy groups who kept the matters always in facade.<sup>41</sup> In the year of 1990, the overall climate change tensions influenced the legislative initiative by European Commission and the member states, especially in 1992 European Commission initiated a remarkable decision on the ground of "Single European Act" that paved

<sup>41</sup> See Spencer Weart (2008): 'The discovery of global climate' (Cambridge: Harvard University press).

the way of carbon tax in the region.<sup>42</sup> However, the decision was not welcomed by the companies and many member states as because of the intervention in the national tax collection freedom and also companies were to put the points the notion of competitiveness would create contenders in the global market<sup>43</sup> and then the EU heads of states gave up carbon tax proposal<sup>44</sup> and in a hope it came back again but failed again. The businessmen, companies and industries constantly were talking about the “carbon trading system” despite of carbon tax putting example from the Acid Rain system of the USA when this proposal got into force after the agreement of Kyoto Protocol by EU where they agreed to minimize the GHGs up to 8% more than to 1990 levels during 2 years period (2008-2010).

Eventually, EU had to come to force and they were on the track to decide how to distribute the responsibilities among the countries what popularly known “Burden-Sharing” and they agreed how to maintain this made the way to create a strategy to bring the practical outcomes of Kyoto Agreement that finally took a shape of European Emission trading System (ETS).<sup>45</sup> There were certain reasons why this step was taken into consideration without taking other options in to account. This very notion is clearly stated and given a straight answer for the decision was made by the EU in the certain issue to implement the Kyoto Protocol Agreement was to

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<sup>42</sup> See <http://aei.pitt.edu/4830/01>

<sup>43</sup> J. B. Skajeerseth and J. Wettstedt (2008): ' The European Emission trading system: initiation, decision making and implementation : London; Ashgate.p.4ff

<sup>44</sup> See <http://www.independent.co.uk/news/uk/eu-carbon-tax-plandroped>

<sup>45</sup> See Commission Communication to the Council and the Parliament(2009)/implementation of Kyoto Protocol

consider it successful outcome by all means what Denny Ellerman and Paul Joskow (2008) talked about:

"A cap-and-trade approach was chosen because it guaranteed a limit on a significant part of the EU's emissions, it was compatible with emissions trading provisions of Kyoto protocol and it was the only other instrument available."<sup>46</sup>

Of course there were different contradictions and disputes regarding the decision and this burden-sharing among the industries and companies. Some did not have any option but to yield. Some got to take it into account as they proposed before about the cap-and-trade system to implement instead of carbon tax. There were some who became the supporters for diverse reasons. They might find it a logical step due the growing tensions of climate change. Some may find it new and innovative opportunities for business and investment. Some were also talking about the ethical issues regarding climate change and policy. Most importantly, the support from the individual member states was very high as they find the ETS as a purely decentralized system and got the authority to exercise and for the industries this same disbursement on the decision making only through the channel of the respective national level made certain.

To give away the large portion of allowances for free for the first phase instead of auctioning was made to see the adaptability of the companies and also the idea to permit the use of offset coming from the Clean Development mechanism putting

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<sup>46</sup> A. D. Ellerman and P.L. Joskow (2008): 'The European Union's emissions trading system in perspective': op.Cit. p.8

the notion of cost minimization for agreement. However, this EU emission trading system turned to be in the disputes and came out with major errors, political upset regarding the old combat of costs and benefits among the interest groups: among the member states as well as among the industries. The matter of conflicts is between European Commission and the member states was about the bargaining from the countries and also about the NAPs for the two periods that is charged with excess allotment of emissions allowance from member countries that brought also the issue of “non-binding” cap in the initial period.

There was the consent among the member states about the total minimization of emissions. They also accepted the idea of burden-sharing and the caps under the ETS where the allocation of permits over the nations was, as we discussed, not centralized who were responsible to take care of National Allocation Plans where still EC was keeping the authoritative role to cancel the National Allocation Plan if it was violated.<sup>47</sup> As per as NAPs are concerned, during the initial phase we see EC claimed only some from the Member states for that reason , scholars observed, states came up with over allowances keeping the interest in mind to placate their respective industries and also it happened because of “non-binding” in the initial trading phase.<sup>48</sup> Considering the notion of banking of permits and the cap between

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<sup>47</sup> See Article.9 and the rules of Directives: Annex.iii

<sup>48</sup> See S. Tilford (2008): ‘How to make the Emissions trading system success’: op.Cit:p.20 and A. D. Ellerman and P.L. Joskow (2008): ‘The European Union’s emissions trading system in perspective’: op.Cit.

two periods was not permitted that played a key function in the carbon price fail.<sup>49</sup>

Because of the excess distribution of permits in the initial phase, the EC tried to be hard in the second phase that also gave birth of disputes and there were allegation by the member states and they challenged EC in the jurisdiction process. Later these disputes were not the centre of discussion because the overall target fulfillment came to play a vital role in the EU to implement the Kyoto Agreement rather competitiveness and efficiency regarding the implementation came into discussion.

The total picture became more viable and all the actors started to be active as well as the arguments on the implementation for the mentioned competitiveness to the emissions trading system for the companies was silent but after the beginning it became significant. There had been a vital question whether ETS made a rough path for the industries that complete in an international field and the answer of this question is put in a various way by the researchers that ETS somehow made competitive insinuation for the industries but in a partial way.<sup>50</sup> Then the two parallel sides were to take into account by the decision makers: one that the responsibility to decrease the emissions level and other to think about the compensation for the industries that are facing competitiveness. There were many suggestions regarding the situation aroused. For carbon reduction in the high

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<sup>49</sup> See F. Convery, D. Ellerman and C. Perthuis (2008): 'The European carbon market in action: Lessons from the first trading period' : Interim Report.CEER

<sup>50</sup> M.Grubb and K. Neuhoff(2006): 'Allocation and competitiveness in the EU emission trading scheme: policy overview: in climate policy 6: pp.77/30

energy industries there were proposals to provide subsidies as compensation, cost alteration on imports and EU quotas for high energy products.<sup>51</sup> Then, in the Copenhagen Conference in 2009, we observed no vital progress was made and so it influenced in the EU steps. The strategy for the ETS was indicating towards a reform after 2012 considering the target of the emission level with the broader company inclusion.

Now to talk more about the European emission trading system, we can have a look on the issue like means of permit distribution that was also debated as soon as the ETS business started for instance “windfall profits” became an important subject due to free allotment of permits when the power sectors were reaping the benefits out of the system even without reducing emissions that made a great debate also. However, considering the rules, the countries of the EU region were given permission to maintain and hold a preserve of new permits to allocate for free to the fresh market participant that also state that these prevailing the market made to give up their permits. So, the regulations gave the market applicants some incentives for making more production ability that is opposite of requirement that implied a negative implications for the desired emissions level.<sup>52</sup> Now to deal with the structured based discussion here, though auctioning was implemented, concerns of “rent-seeking” were not going out of the system but would come back

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<sup>51</sup> H, Asselt and Frank Biermann (2007): ‘European emission trading and international competitiveness of energy-intensive industries: a legal and political Evaluation of possible supporting measures’: Energy policy25: pp.497

<sup>52</sup> D. Ellerman (2006): ‘New entrant and closure provisions: how do they distort?’: working paper 06 Wp.

in a different shape. Then the policy taken for the free distribution could also be explained as it is a political trade off that is necessary for succeeding the support of the countries and the major companies for going ahead on a violent period for ETS execution.<sup>53</sup>

The major change in the European emission trading system came with the reformation and ambition when in 2007 the leaders set up a fresh climate targets with the promise of minimizing of GHGs up to 20% by 2020. To take into consideration the initial trading periods and the experiences, lessons and depictions are learned and acquired made a redevelopment and inspection of the ETS as a renovation project. Moreover The European Commission delivered a branch of proposals and reformations in 2006 that describes transformation from decentralization to centralized approach with the cancellation of National Allocation Policies and to implement an overall EU cap, durable promise to lessen carbon emission, elimination of free allocation of permits and ongoing increase of permits to be auctioned, new way of sharing burden where energy and GDP per capita will be taken into account when allocating emissions promises, assimilation of CCS and the extension for covering industries of the ETS.<sup>54</sup> So the authoritative role was given to the EC as not only a watchdog but a controller.

The overall picture looked very ambitious and the EC had to loosen the knot for instance the way to the complete auctioning of permits from the free allocation was

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<sup>53</sup> P.L. Joskow (2008): 'The European Union's emissions trading system in perspective': op.Cit. p.46

<sup>54</sup> Commission directives (article 30):2006



perforated with as a minimum provisional depreciation options for several countries. However to get the idea from the facts that the reforms were taken by the EC would not make a change in the political economic system that strengthen the EU ETS and the whole mechanism relied on the EC where regulation is centralized and it is necessary to build up the emerging carbon market synchronized.

### **3.3 Emission scheme by Australia**

Shifting our eyes towards the Australian carbon pollution diminution system will make our view more diverse to understand the global carbon emission market. In recent years Australia has made a quite distinguished picture in the politics of climate easing. Taking into account the global economic crisis, the government in 2009 took a verdict to adjourn the initiation of emission trading system that was supposed to start in 2010<sup>55</sup> that was then belated till 2011 that aroused a debate in the country regarding the initiation of an emission trading system could set off new elections.<sup>56</sup> Putting into the national and global context, though Australia's carbon emission is about 1.1 % of Global consideration, for its high domestic dependency on coal has one of the top per capita emissions in the world but the debate and political conflict that encircled the country's reply to climate change opens a broad

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<sup>55</sup> See The Economist on the 4<sup>th</sup> May, 2009 : 'Australia's carbon emissions trading scheme falls victim to recession'

<sup>56</sup> See Telegraph on the 4<sup>th</sup> June, 2009 : Plans for a carbon emission trading scheme may bring an early election.'

insight on the designed political economy.<sup>57</sup> Before starting the market based approach, the main disputes came into context is about the allocation consequences when reduction counts in all vital sectors like transportation and then the “compensation scheme” attracted the key focus and also the political conflicts started in this particular case.

Australian climate mitigation policy is politically intensified sectors from the beginning of its time. The government (Howard government from 1996 and 2007) in the beginning decided not to sign the Kyoto Protocol agreement but there was an option to consider on the basis of compensation benefits coming from the negotiation that it could count the emissions from “land clearing”. The government’s effort to mitigate the climate change comprised of technology driven approach, Mandatory Renewable Energy Target (MRET in 2001) and the preliminary target was that 2% of the Electricity produced in Australia would come from renewable energy sectors by 2010. There were noteworthy political conflicts between environment group and the opposition when government’s environmental policy was designed by the group of lobbyists coming from power industries and high energy sectors that called by “greenhouse mafia”<sup>58</sup>

Climate change mitigation played a great role in Australian politics. At the end of 2007 a new government came into power. The Kyoto Protocol came into force by

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<sup>57</sup> T. Behr and J Martin with W. Hoxtell and J. Manzer : ‘ Towards a global market? Potentials and limitations of carbon market integration’: GPPI Policy Paper No.5: p18

<sup>58</sup> See Tv program : <http://www.abc.net.au/4corners/content/2006>

the new government. By ratifying the Kyoto Protocol Australia did not lose anything as it did not cost anything when we knew by the "Australia Clause" that country did not need to take measures to fulfill the target of emissions reduction. However, the new government first took an initiative to enhance the Mandatory Renewable Energy Target (MRET) and declared that 20% of share of total allocation of renewable energy in the power generation sector by 2020. The government also took a new climate policy with Carbon Pollution Reduction Scheme (CPRS) to start an emission trading system. The Government published a green paper where the design of national emission trading system was outlined in 2008 covering a range of industries, addition of all GHGs, exclusion of Offsets and allowances of Auctioning.<sup>59</sup> The aim was durable and plan was to diminish emissions up to 60% by 2050 compared to 2000 levels. The Prime Minister Rudd declared CPRS an outline of global carbon reduction regime including emerging economies like China and India for sharing the burden in a just and reasonable sense.

There were many criticisms and disputes and public debate around the CPRS. There were different poles with different interests seeking for concessions, especially, business and environmental lobby groups. Many of businessmen were talking about the need for compensation for the "losers" in the proposed carbon emission trading system.<sup>60</sup> We also find many groups in support of the proposed system like several environmental groups. Though the mainstream environment groups supported the

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<sup>59</sup> See ' Carbon pollution reduction scheme: Green paper' Australian government, July, 2008

<sup>60</sup> See G. Gailey(2008): ' Devil in detail of getting the ETS right' : The Age /July 17

newly sketched system, they were talking about the efficiency and efficacy of the market-based approach.<sup>61</sup>

Before launching the Green paper the government speculated the disputes and controversies regarding it. Therefore the government was prepared enough to meet the criteria claimed by the different groups on the logical consequences of the emission trading scheme. For that purpose the government published a detailed plan and explained it considering many aspects together in the immediate paper called "White Paper".<sup>62</sup> In this paper the government portrayed different payment outlines and compensation scheme for the groups or industries those who will be affected by the initiation of the ETS including timeline (starting from 2010), cap-level (5-15% of carbon emissions by 2020 compared to the emission level of 2000 and target of 60% compared to below 2000 by 2050), coverage details (high emission energy sectors and industries including transport along with waste and forestry sector and all GHGs), means distribution ( auction off), linkages (no export of allowances in the initial level but entrance to international carbon credit through the flexible mechanisms of Kyoto Protocol) and cap price( transnational price cap of \$32 for initial five years and 5% increase in each year).

Some may ask, what was the reaction by the different industries and target groups?

Yes, there were many reactions and opposition from the various groups and

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<sup>61</sup> See S. Beder(2008) : 'Emission trading scheme a scam: renewable now!': Green Left Weekly: July 26

<sup>62</sup> ' Carbon pollution reduction scheme: Australia's low pollution future' :Green paper' Australian government, December, 2008

industries because of some hard choices are made in the White Paper. As a result there were a considerable number of allegations coming from different sectors. To compensate these sectors, the scheme designed to consider providing assistances to the sectors like industries and households those are affected and also there was a proposal to distribute 25% of allowances for free to the injured industries e.g. "coal-fired" industries. Now, it is very clear for a person to anticipate the sustainability of this CPRS. It looks like a "compensation" mechanism rather than ETS. Question arises, what is the probability of sustaining such an ambitious program taken by the Rudd government?

The answer is that the further decision of Rudd government in 2009 was to adjourn the launch of the proposed CPRS. One may talk about the Copenhagen Climate Change talks as a reason as it was near. So, the final decision can be made after that talk. There can be many other reasons behind the postponement of the program as well. However Garnaut report explains it in the way:

*"There would be considerable benefit in avoiding the unproductive interaction between the early period of a new trading system and Australia's participation in crucial global negotiations. Otherwise, this period will be one in which every new development in the international negotiations, encouraging or adverse, could have a disproportionate and unhelpful effect on the domestic permit price in an unconstrained market."*<sup>63</sup>

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<sup>63</sup> R. Garnaut (2008): 'Climate Change Review – final report': Chap.13/14

However, the reasons are also could be related with the global financial crisis that started in 2008 and affected Australia also, political reasons related with vote and the reasons related with the threats are coming from the industries about investment and employees.<sup>64</sup> Any way we have seen the differences in the recent outcomes and resolutions.

### **3.4 Carbon markets in the USA**

The climate change and its consequences pauses a great threat to all the country. The USA also, now, along with other advanced industrial countries are taking the issue very seriously and they understood the significance of the emission trading system as what we have seen in the political campaign of Barak Obama.

He said:

*"As president, I will set a hard cap on all carbon emissions at a level that scientists say is necessary to curb global warming- an 80% reduction by 2050. In addition to this cap, all polluters have to pay based on the amount of pollution the release into the sky. Market will set the price but unlike the other cap-and-trade proposals that have been offered in this race. No business will be allowed to emit any greenhouse gases for free. Businesses don't own the sky, the public does, and if we want them to stop polluting it, we have to a price on all pollution."*<sup>65</sup>

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<sup>64</sup> T. Behr and J Martin with W. Hoxtell and J. Manzer : ' Towards a global market? Potentials and limitations of carbon market integration': GPPI Policy Paper No.5: p21

<sup>65</sup> Visit [http://www.barackobama.com/2007/10/08/remarks\\_of\\_senator\\_barak\\_obam\\_28.php](http://www.barackobama.com/2007/10/08/remarks_of_senator_barak_obam_28.php)

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Recently, there are many bills proposed in the Congress regarding the emission trading. There have been many debates, negotiations, agreements and disagreements on the same issue. Like EU and Australia the allocation mechanism is the key subject matter and at the centre of the political debate about the creation of emissions trading system and also issues like the rigidity of cap, use of offsets, the means of allowance distribution are also the matters of conflicts. In 2009, after a long argument House of Representative passed American Clean Energy and Security Act (ACESA) that is the lawmaking “frontrunner” in the US.

The Climate change mitigation and response to the responsibilities are the successful stories for European countries. On one hand, they have proved to be the global leader of reduction of carbon emission. On the other hand they responded to motivate the other nations by the influential EU ETS while the USA has been fluctuating on their position for almost five years. During the office time of Jimmy carter was informed essentially by the Global 2000 Report in 1980 with an explanation of the consequences of rising global warming.<sup>66</sup> Later the Regan Government did not response on that particular issue because of some reasons as there were the question of validity of the report itself was raised by the several scholars. After that long time, Clean Air ACT was passed in 1990 by the George W.

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<sup>66</sup> Visit to see 'global 2000 report' at <http://www.ourtask.org/pub/readings/pdfs>

Bush government to eradicate smog and air pollution. This paved the path to evolve the first cap-and-trade system (the Acid Rain Program) for reduction of emission.<sup>67</sup>

However, the whole world was looking at the Kyoto Protocol in 1997 that the USA would take a bold initiative to reduce the carbon emission and would inspire other countries by taking active part in the ratification. Clinton Government was very active in the market based approach and put the Kyoto Protocol forward by complete sign but it was never passed by the senate.<sup>68</sup> Moreover the senate passed a resolution called Byrd-Hagel Resolution that says the US would not ratify the Kyoto Protocol until there is no ratification for developing as well as developed countries and also if it causes harm to the US Economy.<sup>69</sup>

By this time the science of climate change made a great progress and published several information telling the growing threats of climate change and increase amount green house gases in the atmosphere and also indicating the anthropogenic contribution to it. However the Post Clinton administration did not response that high rather they put a question mark on the scientific evidence of climate change. President Bush's Administration declared that emission trading program could be voluntary and there was a measure to create the Asia Pacific Partnership for Climate that was shown as substitute to the Kyoto Protocol.<sup>70</sup> After that the

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<sup>67</sup> See F. Daniel J(2006): ' The new environmental regulation': Cambridge: MIT press

<sup>68</sup> Visit for the historical understanding , [http://www.dbresearch.com/PROD/DBR\\_INTERNET\\_EN-PROD](http://www.dbresearch.com/PROD/DBR_INTERNET_EN-PROD)

<sup>69</sup> To get details about the Resolution, Visit <http://nationalcenter.org/KyotoSenate.html>

<sup>70</sup> Details about Asia pacific Partnership at <http://www.asiapacificpartnership.org/english/default.aspx>



initiative to pass the bills was taken by some senators but never passed the federal system<sup>71</sup> but in a very optimistic and collective way various states took initiative to response on the climate change issue and developed the regional cap-and-trade system that is called Regional Greenhouse Gas Initiative (RGGI) and the Western Climate Initiative (WCI).

However, the US picture started to improve with the Obama administration. In 2009, Obama's one of the crucial initiatives was to build a "green economy" putting the proposal for the improvement of cap-and-trade system for GHGs.<sup>72</sup> After a long time the Us seemed very active in the field of emissions trading as Obama put his consent on the issue. Though he has shown his support and interest for the emission trading and talked more about that but he did not emphasize on the issue to pass in the Congress as a bill rather he left the whole issue to be dealt by the legislators only.<sup>73</sup> The outcome of the proposals is still not viable. The so called federal climate change legislation is a matter of contentious, still now.

Now, to look into the major elements of the emission trading system in the US, the rigidity of the certain cap has to keep equilibrium between both environmental efficacy and political viability. For doing so compromise is necessary for creating the

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<sup>71</sup> See the summary of 'Lieberman-MacCain climate Stewardship Act' at [http://www.pewclimate.org/policy\\_center/analyses/s\\_139\\_summary.cfm](http://www.pewclimate.org/policy_center/analyses/s_139_summary.cfm)

<sup>72</sup> Details in J. Martin Witte (2009): ' State and trends and public energy and electricity R&D support: a trans Atlantic perspective': op.cit and also see Global public policy institute's conference report : ' governing global oil in the 21<sup>st</sup> century': at [http://www.globalenergygovernance.net/fileadmin/gppi/TESDS\\_Conference\\_Report\\_final.ppdf](http://www.globalenergygovernance.net/fileadmin/gppi/TESDS_Conference_Report_final.ppdf)

<sup>73</sup> T. Behr and J Martin with W. Hoxtell and J. Manzer : ' Towards a global market? Potentials and limitations of carbon market integration': GPPi Policy Paper No.5

proposal edible to the policymakers, industries and to the citizens. The most significant bill regarding emission trading is the Lieberman-Warner bill that proposed to put the cap for the time starting from 2012 with 5.775 billion permits with the per year diminution of 1.8 % when the actual size of the cap of 2050 would be 1.732 billion permits that is 70% diminution on the basis of 2005 levels and participants would get a permit from the Environmental protection Agency (EPA) for a single ton of carbon dioxide equivalent of GHGs which they demolish or use as a response in a system that avoid its discharge to the atmosphere.<sup>74</sup> Thus the bill proposed to cut emissions up to 15% by 2020 which is less than the European ETS.

If we compare this Lieberman-Warner bill with Waxman-Markey bill which was passed through the House only, we see Waxman-Markey bill talked about to diminish emissions to 97% by 2012 compared to 2005 levels, by 2050 it is 80% , 58% by 2030 and by 2050 it is 17% which somehow ambitious and durable goal than the previous one discussed.<sup>75</sup> Then the reviews of the bill in may 2009 deliberated by the US House energy and Commerce decreased the 2020 aim to 83% on the basis of 2005 levels and with the rest (2012, 2030 and 2050) left over same. However, this created a range of debates and disputes among the policymaker, businessmen and huge lobbying; and also the rise of the bill up to 1300 pages following its ways

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<sup>74</sup> For details see <http://www.lieberman.senate.gov/documents/detaildaca.pdf>

<sup>75</sup> T. Behr and J Martin with W. Hoxtell and J. Manzer : ' Towards a global market? Potentials and limitations of carbon market integration': GPPi Policy Paper No.5: p24

through the House express the pressure of amendments by the state governments to get the benefits from the system for their respective states.<sup>76</sup>

Of course there were reactions and different views from different states. Representative R. Boucher from Virginia put enough effort to save “coal-fired utilities and mining firms” and tried to make out Waxman-Makey to admit a little bit more decrease in emission and also to put 30% of permits to assist housing and industrial clients of coal-fired power.<sup>77</sup> However before having an expected committee conversation on the Waxman\_Markey draft, the American Coalition for Clean Coal Electricity (ACCCE) declared that it:

“Supports the timely adoption of a mandatory federal carbon management program and believes that we can fashion a national greenhouse gas emissions reduction policy that 1) achieves emissions reductions, 2) creates job, 3) preserves fuel diversity as means of promoting greater energy independence and 4) focuses on driving down compliance costs as a means of protecting consumers against unnecessary higher energy costs.”<sup>78</sup>

By the statement the ACCCE fully put its notion out of energy and Commerce Committee put support towards the bill and forwarded its consent towards the

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<sup>76</sup> See details

[http://www.energycommerce.house.gov/index.php?option=com\\_content&view=article&id=1625&catid=141&Itemid=85](http://www.energycommerce.house.gov/index.php?option=com_content&view=article&id=1625&catid=141&Itemid=85)

<sup>77</sup> For more on the issue visit: <http://www.publicintegrity.org/articles/entry>

<sup>78</sup> see <http://www.americaspower.org/News/Press-Room/Press-Release/ACCCE-Statement-Regarding-the-Waxman-Markey-Discussion-Draft>

people.<sup>79</sup> Then ACCCE withdrew its support of the bill<sup>80</sup> and continued seeking and lobbying Congress for a cap on the expense of permits and make delay the program to start after 2012 as to get according to their choice or of the benefits.<sup>81</sup>

There were extensive oppositions to this bill. There were many poles against off, especially, the political representatives, businessmen, and environmentalists. The key issue claimed from the American Chamber Of Commerce that actions without international compliance and including the emerging economies would harm the US economy. Thus they cannot accept the bill. They might expect to revisit the bill when the unified initiatives will be taken and there will be no burden on Us economy and also to talk about the international economic condition they would not only go for the compensation excluding the countries who are now economically booming and emitting carbon in the atmosphere. Considering the current lacking and destabilized conditions we cannot accept the bill, said the American arm of Greenpeace. They also stated:

*"This bill has been seriously undermined by the lobbying of industries more concerned with profits than the plight of our planet."*<sup>82</sup>

So the proposals in the legislation procedure in the House and the Senate vary in some points when the consequences of allocation of the cap on the industries and

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<sup>79</sup> See <http://www.americaspower.org/News/Press-Room/Press-Release/ACCCE-Statement-by-ACCCE-Regarding-the-Passage-of-American-clean-Energy-and-Security-Act-of-2009>

<sup>80</sup> Visit also <http://www.americaspower.org/News/Press-Room/Press-Release/ACCCE-Statement-by-ACCCE-Regarding-the-Passage-of-American-clean-Energy-and-Security-Act>

<sup>81</sup> <http://www.eenews.net/public/Greenwire/2009/06/26/4>

<sup>82</sup> See <http://www.greenpeace.org/usa/news/greenpeace-waxman-marky-clim>

consumers are same in the both schemes and more especially the Senate bill and the ACESA suggest actions to tackle leakage concerns when the Lieberman-Warner bill puts a suggestion to tax imports from the countries who are not creating same greenhouse gas diminution by themselves. Moreover, it is necessary that importers of high energy products to buy the permits and also ACESA would need importers of high energy products to purchase allowances if other actions in the bill fail to avoid leakage. Taking an inclusive climate change policy and also considering the costs related with the cap might have vital consequence of allocation on consumers that also similarly proven by the previous discussion.<sup>83</sup>

Now, as a consequence, cap-and-trade policy would amplify the price of high energy products that would affect the consumers in the end; especially the less income consumers would be affected much. Keeping this fact in mind, a forecaster from Congressional Budget Office explained that 15% cut in carbon dioxide emissions could cost the average household on average \$1,600 per year though this forecasting missed to take in the proviso of repayments to households that would originate from the intended auctioning of the permits that was planned under ACESA.<sup>84</sup> Moreover, this crucial testimony explained that the costs have been discussed about could be offset when the revenues from the permits were coming

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<sup>83</sup> T. Behr and J Martin with W. Hoxtell and J. Manzer : ' Towards a global market? Potentials and limitations of carbon market integration': GPPI Policy Paper No.5: p25

<sup>84</sup> See 'The distributional consequences of a cap-and-trade program for carbon carbon dioxide emission' at <http://www.cbo.gov/ftpdocs/21xx/doc2104/carbon.pdf>

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back to the consumers and the lower income households would ended up well by the policy that was designed.<sup>85</sup>

Looking back at the policies and distributional mechanism of EU, especially our discussion regarding free allowance allocation and excess profit, the US also followed these.<sup>86</sup> However, the discussion went more deep and significant when Senators H. Clinton and B. Sander suggested an amendment which would have led to 100% auctioning of emissions allowances but this idea was debated as well and the proposal made by them was not highly praised by the others and the amendment was finally defeated in the committee. Senator Lieberman denoted the amendment as:

*"A poison pill, substantively wrong and that will not only kill the bill, but kill a lot of companies as well."*<sup>87</sup>

Eventually, the proposed bill was not successful in the Senate for reasons like the bill would increase energy costs and the provisions in the bill were tighter that Democrats did not accept.<sup>88</sup>

The Waxman-Markey bill, on the House of Representative, provided some

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<sup>85</sup> See 'Who gains and who loses under carbon-allowance trading? The distributional effects of alternative policy design' at <http://www.cbo.gov/ftpdocs/21xx/doc2104/carbon.pdf>

<sup>86</sup> See ' International climate change programs : Lesson learned from the European Union's emissions trading scheme and the Kyoto protocol's clean development mechanism' at <http://www.gao.gov/new.items/do9151.pdf>

<sup>87</sup> See the ' The status of Senate bill 2191, the Lieberman-Warner climate security act' at <http://www.lieberman.senate.gov/documents/detailedacs.pdf>

<sup>88</sup> See Time Magazine, 10 June, 2008 : 'Why the climate bill failed'

compromises in the latter and renovated form that was passed by the US House Energy and Commerce Committee and House of Representatives in 2009, the legislators made a contract to distribute up to 80% of the credits for free and the remaining 15% being auctioned when the free credits would phase out supportive of a full auctioning of permits.<sup>89</sup> The power industries would get free permits and the oil and gas industries would “lose out” on the allocation of free permits. The updated bill that’s why would distribute 2% of permits to the oil and gas industry, the sector that is accused of emitting 30% of total national emissions when electricity utility industry would receive about 35% permits which emits about 40% GHGs of total US emissions. Eventually but not unexpectedly the complaints were high.<sup>90</sup>

Turning our discussion to the offsets is necessary here in the context of the US emissions trading mechanism. It was viable that industries want a larger share offsets to diminish the total cost of the of emissions decrease when several points have been made by the scholarly reports those are skeptical about efficacy of the offsets like Clean Development Mechanism (CDM).<sup>91</sup> We see that in the Waxman-Makey bill in the House held great chances for purchasing offsets as in its original version the bill permitted for 2 billion tons of emissions attenuation generated

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<sup>89</sup> Details of Waxman-Markey bill at <http://www.graphics.thomsonreuters.com/ce-insight/EMISSIONS-BILL-HR2454.PDF>

<sup>90</sup> See ‘Complaints from left and right as House climate mark up nears’: New York Times. 18 My, 2009

<sup>91</sup> V. David and M.D. Wara (2008): ‘A realistic policy of International carbon market’: Stanford University: Stanford, CA

through the buying of offsets. Considering the appropriate contribute of domestic emissions offsets is not available, the edge of international offsets could be lifted up to 1.5 billion tons annually at the judgment of the Administrator of EPA. When the measure of the total carbon savings coming from offsets program is very hard, the huge amount of use of international and national offsets could extensively impact the efficiency of the cap.<sup>92</sup> However in the renovated form of the bill, the offsets options were altered greatly. Talking about the Lieberman-Warner bill that permits the offsets 15% of yearly emissions cap from the national programs when for international programs 5% of the cap and there would be 10% for international forest carbon offsets, it was clear enough that if these limits are not fulfilled permits from other international trading systems could be used.<sup>93</sup>

Therefore the conversation of the US climate change policy where companies are seeking to obtain offsets credit for any type of activity that would lead to a diminution in emissions down the product chain. However when the Waxman-Markey bill moved to the Senate, a number of scholar predicted the offsets options would once again be failed.

To indicate briefly towards the coverage of the cap that includes all the preliminary GHGs discharged by major sectors are power generation, manufacturing and transportation. Starting from 2012, the ACESA includes electricity generators, fuel

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<sup>92</sup> T. Behr and J Martin with W. Hoxtell and J. Manzer : ' Towards a global market? Potentials and limitations of carbon market integration': GPPi Policy Paper No.5: p26

<sup>93</sup> See for more perspective, 'EPA analysis of the Lieberman-Warner climate securityact of 2008' visit <http://www.epa.gov/climatechange/economic/pdfs>



refiners as well as blenders and fluorine gas manufacturers those will be under the program. However the total mechanism depends on the senate to pass the cap-and-trade legislation that is still incomplete.

The overall comparative conversation clearly provides some messages to understand the carbon market deeply. The prevailing and the proposed emissions trading system in these three broad areas give us a ground level understanding of the global scenario of in the global level. The conversation provides us the political-economic disputes and differences and also the different dynamics that guide these systems. Though the basic design characteristics of this market based systems are same but they differ mostly on the several grounds where the political battles are noteworthy along with the allocation of costs and benefits of emissions trading across the economies. The EU ETS provides us the advancement of the emissions trading schemes for creating a further rigorous emissions trading system along with further mitigation possibilities. The American and Australian scenario is destabilized and insecure where political support and strategies play a great role and set up a new stage of conversation where rising countries such as china is a matter of fact. We will look at China in a separate conversation because of its distinguished features of the ongoing climate change policies. The policies those are interrelated but in a very complex way. However, the EU ETS indicates that perfection does not come at the starting point but it can be acquired with the execution of practical initiatives.

## ***4. Carbon emission trading in global level***

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### **4.1 Emissions trading in China**

In the current emissions trading world china is in the centre of discussion and attention. The structure and development of carbon emission in China is the greatest interest of the international emissions trading markets. Currently, China is responsible for a quarter of total GHGs of global level and almost a half of yearly emissions augmentation.<sup>94</sup> This picture will rigorously will continue with increasing trends that is a crucial point for the world to keep the global warming less than 2 degree Celsius. In the recent report in 2011, the Joint Research Centre for European Commission and the Netherlands Environmental Assessment Agency declared that per capita CO<sub>2</sub> emissions have already touched 6.8 tones.<sup>95</sup> They also anticipated that by telling that if this continues China's per capita emissions may exceed the US by 2017. This is obviously a great threat to the mitigation of carbon emission.

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<sup>94</sup> See Steckel, Jakob, Marscinski and Luderer (2011): 'From carbonization to Decarbonization? – Past trends and Future Scenarios for China's CO<sub>2</sub> emissions': Energy policy

<sup>95</sup> See Olover, Janseens, Peters and Wilson (2011): 'Long term trend in global CO<sub>2</sub> emissions':2011 report

As, of course, China took economic growth as its top national priority, now it faces a serious energy and climate security dilemma.<sup>96</sup> There is no doubt that China has uplifted the hundreds of millions of people out of poverty and contributed in their life but it also has put a great environmental pressures, contributed in the ecosystem damage and the paucity of resources counting energy sector. Therefore to start a low carbon and resource efficient development initiatives are now a key national interest of the country.<sup>97</sup> So the central initiative to cost effective emission diminution to the green development strategy in china has been shaped in the present twelfth Five Year Plan (FYP). Before that plan, carbon emission reduction measure was not incorporated in the clear environmental and resource use targets. However, there were some diminution achievements as a “co-benefit” of developing energy efficiency. Moreover, China also fashioned an inspiring and credible package of climate associated policies in the framework of sustainable development in general in 2006. China also was a first developing country to execute a National Climate Change Program in 2007.<sup>98</sup> China also published a White Paper on its measures and policy on climate change.<sup>99</sup> China also promised to voluntary reduction of the carbon intensity of its GDP by 40% to 45% by 2020

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<sup>96</sup> See Halding, Han and Olsson (2009): ‘China’s climate and energy security dilemma: Shaping a new path of economic growth’: *Journal of current Chinese affairs* :38(3):119-134

<sup>97</sup> See more Jiang, Sun and Liu (2010): ‘China’s energy development strategy under the low carbon economy’: *Energy*35(11): 4257-4264

<sup>98</sup> See National Development and Reform Commission (NDRC) -2007: ‘China’s national climate change program’

Visit <http://en.ndrc.gov.cn/newsrelease/Po20070604561191006823.pdf>.

<sup>99</sup> See State Council Information Office (2008): ‘China’s policies and actions for addressing climate change’

compared to 2005 level and they took this decision before the United Nations climate change conference (COP15) called Copenhagen conference.

Most importantly, in the 12<sup>th</sup> FYP a compulsory target on carbon intensity was included to for decreasing the carbon intensity up to 17% by 2015 compared to 2010 levels.<sup>100</sup> By fulfilling this target china will cover international promise when china has decreased its carbon intensity by nearly 20% throughout the 11<sup>th</sup> FYP. Considering the international promise and national targets, the scholars have stated that the initiatives are taken by China are ambitious and logically well-matched that is required for a global curve for a 450 ppm stabilization picture.<sup>101</sup>

To tackle with the greenhouse gas emissions, China has taken a command and control initiative on the basis of administrative and political measures. Targets are set at various levels such as national, provincial as well as industrial level considering the energy intensity as the diminution has been achieved through imposed shutting of deficient plants and factories. Resource taxes, tax breaks and consideration of subsidies and investment these are the tools are not taken as the medium of mechanism.<sup>102</sup> Without any hassle, Chinese government came very near to acquire the 20% target of energy intensity of GDP diminution through the 11<sup>th</sup> FYP from 2006 to 2010 though “back outs” of industries and some cities were not

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<sup>100</sup> See Han, Olsson, Hallding and Lunsford (2012): ‘China’s carbon emission trading, an overview of current development’: Stockholm Environment Institute:: FORES study 2012

<sup>101</sup> See more X. Zhang (2010): ‘ China in the transition to a low carbon economy’: Energy policy 38(11): 6638-6653

<sup>102</sup> See Q. Wu (2011): ‘Regional Allocation of carbon dioxide abatement in china’: Greenhouse gas market report 2011: ‘Asia and Beyond: the roadmap to global carbon and energy markets’: Geneva, Switzerland: International Emissions Trading Association:22-25

unusual at the edge of 2010 and also several number of provinces were obliged to close down full-size wraps of industrial capacity as part of last channel efforts to the targets. The insufficiency and cost competence of heavy dependence on political actions are revealed by the 11<sup>th</sup> FYP.

Thus, this shows the tough motivation from the Chinese government to create and believe more on market-based mechanism for instance taxation and emissions trading schemes for the promised reduction as the EU ETS has already been proved to be a successful model in this regard. Chinese experts also have been engaged in finding the facts as they are visiting and exchanging the ideas with EU experts. From the COP15 in 2009, the Chinese government is enthusiastically expressing high interest in the emission trading system by encouraging and supporting research and experiments in the sectors and finally in the 12<sup>th</sup> FYP (released in 2010) the government declared to set up a national carbon trading system by 2015. Moreover, in 2011, the national Development and Reform commission of China formally permitted the initiation of carbon trading pilots in seven provinces and cities that shows the successful experimentation willingness of the Chinese government.<sup>103</sup> Nonetheless, carbon trading also has been considered a key market-based tool for the development of energy efficiency that is the preliminary importance of the Chinese Government in tackling the climate change mitigation challenges and setting a price on carbon will force businesses for using energy more

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<sup>103</sup> See Han, Olsson, Hallding and Lunsford (2012): 'China's carbon emission trading, an overview of current development': Stockholm Environment Institute:: FORES study 2012

intelligently by rising their energy competence and receiving more of their energy from renewable sectors. Eventually, both of them would reduce carbon intensity.

#### 4.2 More about emissions trading systems

The tables below show the carbon markets around the world with recent developments both in the established and emerging schemes where emerging markets are the subjects of attention in present political economy.<sup>104</sup>

Table 4.2a Established schemes of the emissions trading

Kyoto Protocol (KP)	Kyoto Protocol Established in 2005 with the target to diminish emissions by 5% below 1990 levels from 2008 to 2012; for the 37 countries with obligatory targets where countries may diminish emissions at national level, purchase allowances from other countries and also they can purchase offsets from the projects in developing countries under the CDM.
	The more or less successful story of the field that was established in 2005

<sup>104</sup> See more See Han, Olsson, Hallding and Lunsford (2012): 'China's carbon emission trading, an overview of current development': Stockholm Environment Institute:: FORES study 2012

EU ETS	<p>obligatory for all 27 EU members and also Iceland, Liechtenstein and Norway with a target to diminish emissions by 21% below 2005 levels by 2020 where member states distribute quota of emission permits to 11,000 industrial installations and industries get more allowances free during the second phase on the basis of historical emissions. Moreover, several electricity generators will be paying for all these from 2013 that is third phase and more than 3000 airline operators supposed to join in the scheme in 2012 including China.</p>
	<p>It was established in 2010 with obligatory target to cut GHG emissions between 10 to 20% by 2020 compared to 1990 levels where emissions units are distributed on the basis of an average of production across every industry and the sectors included are forestry, electricity,</p>

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<p>Emissions trading scheme in New Zealand</p>	<p>industrial process emissions and transport, waste that will be starting from 2013 and agriculture from 2015. Taking about the price from 2010 to 2013, emitters have the option of paying a fixed price of NZ\$25 for each tone of carbon and only have to surrender 1 unit for each 2 units of emissions.</p>
<p>Regional Green-house gas initiative (RGGI): USA (Northeast)</p>	<p>The establishment was in 2009 including carbon from power plants in ten states in the Northeast of the US with a target to lessen emissions by 10% below 2009 levels by 2018. It also permits offsets from five different types of clean energy projects covering methane from landfills and livestock manure but mentioned that only if a US\$7 per ton price trigger is hit.</p>
	<p>It was established in 2010 including around 1,400 highest emitters in the</p>



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Emission trading scheme in Tokyo, Japan	metropolitan area. Japan aims to cut emissions by 25% by 2020 from 1990 levels and Tokyo puts emissions limits for large companies and offsets can be met using technology for instance solar panels and advanced fuel saving devices.
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Table 4.2b Emerging Schemes of the carbon markets

Australia	The scheme was taken into account by the Australian Parliament including emissions from all sources except agriculture and land use, or the combustion of biomass, "biofuels" and "biogass" and the national target covers to cut emissions by 5% below the 2000 levels by 2020 where 500% companies should pay a tax of A\$23 per ton of carbon from 2012 growing around 5% a year and move to a market based scheme in 2015.
	It will be established in 2013 with the

<p>California Climate Change Law (AB32)</p>	<p>first allowance auction in 2011 including emissions from power plants, manufacturing and transportation fuels (that will be starting from 2015) and the target covers to cut the state's emissions to 1990 levels by 2020 where most of credits will be distributed free in the initial years and emitters will be allowed to use offsets to fulfill up to 8% of their mandatory compliance.</p>
<p>Western climate Initiative (WCI)</p>	<p>It will also be starting from 2013 including California, Canada's British Columbia and Quebec may also Ontario with a target to cut emissions by 15% below 2005 levels by 2020; where under the scheme emitters for instance power plants will have to buy offsets to cover their emissions.</p>
	<p>It is expected to start from 2015 including around 470 industries from</p>

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<p>Emissions trading scheme in South Korea</p>	<p>every sectors that all together produce about 60 % of the country's emissions and the government has set a 2020 emissions diminution target of 30% below the estimated "business as usual" levels.</p>
<p>India</p>	<p>It will be starting from 2014 after a three year squash period that is obligatory energy efficiency trading scheme including 8 sectors those are responsible for 54 percent of India's industrial energy consumption with a 20 to 25% diminution in emissions intensity from 2005 levels by 2020 where under the scheme yearly efficiency targets will be distributed to firms and also tradable energy saving allowances will be issued on the basis of energy saved during a target year.</p>
	<p>It somehow launched in 2011 and permitted pilot tests of carbon trading in</p>

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China	seven provinces and cities and some of the pilot regions can start trading from 2013/2014 when a domestic trading scheme is expected by 2016
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By our previous conversation on emissions trading about the political economy of carbon market, we have seen that industries, factories and companies are impacted by both voluntary and obligatory emissions trading system regarding as far as the costs and benefit issues are concerned. Currently, EU ETS captures almost 845 to 98% of the value of the carbon markets that includes energy related emissions and process emissions from the certain industries those cover power stations, offshore operations, refineries, iron, steel, cement, lime, paper, food, drink, glass, ceramics, engineering as well as vehicle manufacture when the EU ETS captures EU's overall CO<sub>2e</sub>.<sup>105</sup>

As we sketched in the table.3 and 4, a regional cap-and-trade scheme called the Regional Greenhouse Gas Initiative (RGGI) including the power sectors in nine states and provinces in the US is active from 2009. Recently, Australia has made the laws to start actively from 2015. New Zealand already has an ETS. Coming years many countries are launching cap-and-trade systems following the EU ETS. The world's eighth largest economy California starting from 2013 that system

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<sup>105</sup> See World Bank 2012(2): ' States and trends of carbon markets 2011' and also see IESE Business School for Ernst and Young (2012) : 'The future of global carbon markets'

preliminary will include the power sector and large industries that is responsible for 855 of total California's GHGs emissions; and in 2015 the emissions trading system will increase covering allocators of commercial, residential and transport fuels. For increasing environmental effectiveness and efficiency the emissions trading is designed to connect with other programs as well.

However, the largest emitters of the earth are the US and China who are also considering domestic emissions trading system. As we already discussed broadly, the US delayed because of financial crisis and political consent but we stated that China is starting regional pilot schemes by 2015. Most striking is that the inclusion of aviation sector is on the way to develop. In 2015, South Korea will join in the emissions trading system. Many of other developing countries such as Brazil, Chile, Mexico, Colombia, Thailand, Vietnam, South Africa Ukraine and Turkey are reviewing national trading system and the Mexican government has already passed a climate bill that includes a domestic ETS.<sup>106</sup> However, most of the schemes we are taking about are at the private level; only UN International Trading Mechanism, one of the flexible mechanisms under Kyoto Protocol is happening at the government level.<sup>107</sup>

So, we noticed a number of progresses in the field of emission trading. One of the striking progresses in the carbon markets is the link between the domestic systems

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<sup>106</sup> See for the Partnership for market readiness (PMR) at <http://www.wbcarbonfinance.org/Router.cfm?page=PMR&ItemID=61218&FID=61218>

<sup>107</sup> see IESE Business School for Ernst and Young (2012) : 'The future of global carbon markets'

such as Australia and EC as they agreed in 2012 for creating full-link their ETS by 2018 what will permit the companies and industries of the countries to purchase and sell carbon allowances among themselves.<sup>108</sup> We have also seen EU ETS has been connected with Norway, Liechtenstein and Iceland. Moreover the discussion is going on to connect the EU ETS with California and Swiss ETS with a view to creating OECD-wide carbon market by 2015 and extending to developing countries by 2020. This progress is very crucial for increasing environmental and economic efficiency. This trend also opens a path towards a global carbon market creating a global carbon price and “level playing field” for businesses which is the main purpose of this research.

We know, yet, there is no global carbon market. There are many regional markets those are governed by different jurisdictional levels. The existing carbon markets are formed of four systems.<sup>109</sup> The systems are noted below:

1. Cap-and-trade system (ETS) for high energy business sectors and governments
2. Kyoto Flexible Mechanisms ( such as CDM, see Box.4.2a ) on public and private level respectively
3. Offset schemes (Domestic)
4. The Voluntary carbon market

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<sup>108</sup> For more visit <http://www.climatechange.gov.au/en/media/whats-new/linking-ets.aspx>

<sup>109</sup> See IESE Business School for Ernst and Young (2012) :‘The future of global carbon markets’

*Box 4.2a*

***Kyoto Flexible Mechanism***

*Under the Kyoto Protocol the flexible mechanisms were recognized. These mechanisms were established for giving the industrialized country who signed with provisions or alternatives to lessen the GHGs nationally. There are three mechanisms:*

- a) International Emissions Trading*
- b) Joint implementation (JI)*
- c) The Clean Development Mechanism (CDM)*

*The mechanisms were extended in the second commitment period to the Protocol at the 17<sup>th</sup> Conference of the Parties (COP 17) in Durban. The negotiation result was that the flexible mechanisms will continue till 2020.*

***Domestic Offset Schemes***

*It is a mechanism to kindle more emissions diminutions and abatement in non traded sectors. The program activities are executed in the investor country where other countries are not involved.*

***The Voluntary carbon Market (VCM)***

*The Voluntary carbon market is a kind of voluntary cap-and-trade systems which is*

*not regulated. On the other hand, mandatory or compliance carbon market is regulated. However, VCM is very significant though it represents only around 0.3% of the global carbon market. The VCM is growing rapidly and provides carbon offsets to compensate for greenhouse gas emissions those are not included in the compliance schemes.*

In addition, up to the Durban Platform implementation, sectoral mechanism and credited NAMAs are also considered as alternatives. These systems include trading of carbon credits or permits and become the components of carbon market. However, Scholars predict that these market elements will affect businesses.<sup>110</sup> By the World Bank report, the overall value of the global carbon market in 2011 was US\$176b and from 2005 till 2011 grew from an initial value of US\$11b.<sup>111</sup>

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<sup>110</sup> See more on the issue ' How do companies do business in a carbon constrained world: investment decision and bottom line': Ernst and Young (2012)

<sup>111</sup> See ' state and trends of the carbon market 2012': World Bank



## *5. The theoretical projections of global carbon markets*

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### **5.1 Contemporary picture**

In the Conference of Parties 15 (COP 15) in Copenhagen in 2009 under the United Nations framework Convention on Climate Change (UNFCCC) a tension and disappointment grew among the countries and the future of the carbon markets transferred from “top-down” approach to “bottom-up” approach. In the nonexistence of strapping international policy drivers, each nations and local authorities were enforced to build up low carbon strategies by themselves. Then the trust was regained in the COP 16 talks in Cancun in 2010 on the basis of the multilateral processes. After that, all countries including developed and developing countries reached an international climate agreement in the COP 17 in Durban that was the greatest achievement since the signing of UNFCCC in 1992. However, this agreement agrees in the future that says till 2020 climate policy will be guided by the domestic efforts of each country.<sup>112</sup>

The key decisions were taken in the Durban conference was an amalgamation of provisional promises and tools<sup>113</sup>. The provisional promises are shown below:

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<sup>112</sup> See IESE Business School for Ernst and Young (2012) :‘The future of global carbon markets’

<sup>113</sup> See ‘ Into the unknown : climate change post Durban” : Ernst and Young (2012)

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1. There will be an execution of voluntary “pledge and review” agreements up to 2020 that was initiated at both COP 15 and 16.<sup>114</sup>
2. There was the consent regarding the extension of the Kyoto Protocol for a second commitment period till 2017/2020 excluding the US, Russia, Japan and Canada.
3. There was the Durban Platform for Enhanced Action which is a negotiation pathway that aspires to concur on the targets and scope of a new future climate system by 2015 that is applicable to all parties from 2020.

There were other decisions as well which include mitigation, adaptation, technology and financing tools that necessitate for further development over the next four years. In the COP 15 and 16 the urgency of limiting global temperature increase 2 degree Celsius was also prioritized as scientists warned again and again. The commitments are made set a path to a temperature increase of 3.5 degree Celsius or more that indicates there is an “ambition or emission gap”.<sup>115</sup> Eventually this pressurize on the level of commitments which are necessary to be concurred by 2015 under the Durban Platform in terms of targets and financing respectively.

To notice, in addition, that the nature and scope of the post 2020 agreements is not determined any way. As we knew, Durban created an Ad Hoc Working Group on the Durban Platform for Enhanced Action (AWG-DPEA) that has the authorization to

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<sup>114</sup> See the Cancun agreements of COP 16

<sup>115</sup> See Climate action tracker (2011) at <http://www.climateactiontracker.org/>

build up “a protocol, another legal instrument or an agreed outcome with legal force under the Convention applicable to all parties”.<sup>116</sup>

Therefore a number of challenges come to front those need to overcome.<sup>117</sup> The challengers are as such:

#### Challenges-

- It is necessary to define the targets. Otherwise the might end up as weak and unable to run domestic abatement.
- Though it looks ambitious, we are not obvious that the agreement will be sufficient or not to stabilize temperatures without increasing the range of individual voluntary Cancun promises made till 2020.
- There is an ambiguity or may be not legally binding, if chosen, with the option of an “agreed outcome with legal force”.<sup>118</sup>
- The significant debate is that the Kyoto protocol was signed by the US but not ratified and left out the world’s largest emitter free for obligations that came to force in 2005; and also there might be a chance of opt-outs for countries under the Durban Platform in the same way.
- Canada withdrew formally from the Kyoto Protocol and going out of Kyoto before the end of the first commitment period given Canada to avoid paying

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<sup>116</sup> See more UNFCCC COP decision 1/CP.17 at <http://unfccc.int/documents/decisions/items/3597>

<sup>117</sup> Look IESE Business School for Ernst and Young (2012) :‘The future of global carbon markets’

<sup>118</sup> Visit, World Resources Institute (2011) at <http://www.insights.wri.org/news/2011/12/qa-legal-aspects-durban-platform-text>

the penalties of around US\$13.6b for not fulfilling its targets.<sup>119</sup> A participant or party possesses the right or “legal right” to withdraw from the Protocol though in terms of target commitment Kyoto was legally binding.<sup>120</sup> This poses a great threat and it would decrease faith in a new deal.

There are the positive sides of the agreement those are motivational and inspirational. These positive sides are discussed briefly here:

Positive sides-

- The key point is that the agreement politically unites all countries. It also offers some kind of surety that there will be a legally binding outcome with promises from all main emitters.
- As we discussed the Durban Platform creates for more ambitious commitments than recognized in the Cancun promises. Kyoto Protocol’s targets for the second commitment period required for the negotiation and in return for this ratification the EU may claim higher ambition from the Cancun promises.
- Considering the Durban platform timeline, the parties will get enough time to prepare themselves with a road map for the negotiation and also the global financial crisis period to pass.
- For the post 2020 agreement, consensus among the parties will be necessary on the three legal options (as to mention here, a protocol, a new

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<sup>119</sup> See, Vancouver Sun (12/12/11)

<sup>120</sup> See Article 27 at [http://unfccc.int/essential\\_background/kyoto\\_protocol/items/1678.php](http://unfccc.int/essential_background/kyoto_protocol/items/1678.php)

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legal instrument or a decided outcome with legal force under the convention which is applicable to all parties). Most of the parties, as it looks, will favor a legally binding agreement comparing with Kyoto Protocol, as it is oppose to the weaker third option.<sup>121</sup>

However, by this time, around the world the bottom-up approach as independent of international policy developments will be continuing with all kinds of national measures. Moreover, the recent development in the climate change and Conference of Parties in Doha (COP 18) has been shown in the box.2 below.

*Box.5.1a*

***COP 18***

*The Conference of parties 18 (COP 18) took place in Doha of Qatar. The Kyoto Protocol was extended till 2020 and the Durban Platform was Ratified that means a successor to the protocol should be developed by 2015 and it should be implemented 2020. The concept of "loss and damage" was included for the first time as a language adoption which is a principle in agreement that broadly says; developed countries would be financially accountable to other nations if they fail to decrease carbon emissions.<sup>122</sup>*

<sup>121</sup> See IESE Business School for Ernst and Young (2012) : 'The future of global carbon markets'

<sup>122</sup> See BBC, News on 8<sup>th</sup> December, 2012 : 'Climate talks : UN Forum extends Kyoto Protocol to 2020'

*The Outcomes of COP 18*

- *Extension of the Kyoto Protocol: 8 years.*
- *Scope: limited, only 15% of global carbon emissions for the lack of participation of Canada, Japan, Russia, Belarus, New Zealand and the US because developing countries China, India and Brazil are not the part of emissions reduction under Kyoto Protocol.*
- *Language on “loss and damage”*
- *Little progress regarding the funding of the Global Climate Fund (GCM)*

## **5.2 A gap in the climate finance**

For playing a key role in climate finance, private sector is an enormous chance to deal with as 86 percent of global investment comes from private sector.<sup>123</sup> For the large range of investment and emissions diminutions required to address climate change, business involvement is crucial. For exploiting the private sector funding, a strong promise is mandatory from the public policy makers with a transparent

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<sup>123</sup> See ' Fact sheet- Financing climate change action' at [http://unfccc.int/fact\\_sheets/items/4982.php](http://unfccc.int/fact_sheets/items/4982.php)

initiatives. To shape a result based climate aim, two major issues like finance and ambition need to be determined when carbon market is a significant device to attain the pragmatic emissions diminution aims, for instance, reckon on putting an ending to the financing interruption.

We have seen in COP 15 in Copenhagen that the international society put their consent on the “first-start financing” of US\$10b on yearly basis during 2010 and 2012 and also later assemble US\$100b on a yearly basis starting from 2020 for our concerned climate change mitigation and adaptation. So far, we are not clear that how this money will be prearranged and also what will be happening during the time period between 2013 and 2020. We know that a part of this money planned to channel through the Green Climate Fund (GCF) under UN and, in addition, the World Economic Forum’s projection was that yearly low carbon funding necessity is around US\$500b by 2020 to seal the emissions gap while real clean investment particularly valued US\$243b in 2010.<sup>124</sup>

It looks clear that the US\$100b for closing the gap is not adequate enough. Now it is high time that the private finance should fill the gap by a modest share to the shortage. The problem is that the design of the funding is not worked out till now. On the other hand, a new market apparatus can carry returns through carbon credits and other scheme correlated upsides for instance electricity revenues.<sup>125</sup>

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<sup>124</sup> See for details ‘World Economic Forum and Bloomberg New Energy Finance’/Green Investing: Reducing the Cost of Financing : 2011

<sup>125</sup> See more IESE Business School for Ernst and Young (2012) :‘The future of global carbon markets’

Moreover, possibility for opening up new markets and products, amplify brand, investor value and risk and also supply chain management are the additional motivations for private financiers.<sup>126</sup> However, by any case, public policy promise and cooperation is very necessary to boost the private sector finance.

### **5.3 Details of CDM and the new market mechanisms**

The Clean development mechanism is the talk of the day. It is considered to be the key international mechanism for mitigating climate change in the developing countries. There several criticisms regarding this mechanism as well such as sluggish bureaucratic process, complex design; and costs and sensitivity to fraud and also it is repeatedly said that for having a large size of climate change mitigation this approach has a very limited approach. Considering these very draw backs, the UNFCCC is counting certain reforms when some alternative mechanisms also are also proposed for sizing up the offsetting volumes.<sup>127</sup> Sectoral and bilateral mechanisms, Reducing Emissions from Deforestation and Forest Degradation (REDD+) and Nationally Appropriate Mitigation Actions (NAMAS) are the new mechanisms have been considered to size up offsetting in the developing countries. The goal of these is to increase the overall level of CDM.

A number of these new mechanisms is still under design and expected to launch by 2020. The table.5 below clearly expresses that these mechanism can represent a

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<sup>126</sup> See more on the issue ' How do companies do business in a carbon constrained world: investment decision and bottom line': Ernst and Young (2012)

<sup>127</sup> See IESE Business School for Ernst and Young (2012) : 'The future of global carbon markets'



great opportunities for the private sector. The NAMAs has already become a significant topic for consideration to the business community. There is a tendency from the industries who already have experience in the carbon market mechanism are expected to profit most as new mechanisms flourish in the project. It looks like that the NAMAs can lessen the emissions in the developing countries in a significant way when they are likely to be executed. Here comes the important role of private sector as far as funding is concerned. So developing countries should not fully rely on GCF (private sector may invest here as well), rather they can build a partnership with business in the range of NAMAs. This kind of twofold approaches will accelerate the low carbon development and eventually increase the competence and usefulness.

The new market mechanisms are the vital dimensions of the carbon markets. There is a potential and theoretical need to understand these mechanisms that is related to our research. The table below shows the details of the new market mechanisms.<sup>128</sup>

Table 5.3a new market mechanism

List of new market mechanisms	Depiction	Categories /Status	Private sector Involvement
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<sup>128</sup> See the structure and description of the new market mechanism in IESE Business School for Ernst and Young (2012) :‘The future of global carbon

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<p>1. Bilateral offsetting of Crediting mechanisms</p>	<p>This is an agreement between a country with an international emissions cutback targets and developing countries with no targets like that.</p>	<p>At present, Japan is funding for pilot projects</p>	<p>Like CDM, here also the private sectors play a parallel role for playing through investments in returning for offsets.</p>
<p>2. REED+</p>	<p>This a set up mechanism for stopping global level deforestation giving the developing countries financial incentive to protect forests in returning to carbon credits.</p>	<p>International agreement on the REED mechanism was formed in at COP 16 in Cancun though the design is not established yet. It is only operational in the voluntary level of carbon market</p>	<p>Finance is the key issue where it is stated that public finance will not be enough for this kind of funding and private funding is essential. Currently, we see finances are involved in the</p>

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			forestry sector of carbon market only, there is a financing projects returning for carbon credits for tentative or CSR.
3. Sectoral-crediting mechanisms	The design is not established yet where the general plan is to credit emissions declines that will be achieved on the combined in a specific sector below a convinced predefined base line. The scope comprises sectors in one country or	It is still a subject to design and negotiation	Private sectors, like CDM, will play a role through investment returning foe offsets.

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	globally.		
4.Sectoral-trading mechanism	It expresses the that developing countries are committing to emissions reduction, by legally, for the certain sectors under UNFCCC where regulations can be compared with ETS	It is also subject to design and negotiations	Here it is to mention that Industries will be subject to the compliance system through a the ETS
	It implies an extend definition for voluntary emissions decrease initiatives that is subject to undertake by the developing		

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<p>5.National Appropriate Mitigation Actions (NAMAs)</p>	<p>countries that would meet the needs of their situations where they are supposed to be one of the major ways for the mitigation action in the countries under a upcoming climate agreement and they can take the form of policies executed at domestic or local levels. It can be program based, as with CDM, domestic wide or sectoral (e.g. ETS) and there is a</p>	<p>It's scope and design still not clear</p>	<p>Here again private sector will play a significant role as far as funding is concerned and there will be a lot of opportunities for the countries.</p>
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	possible inclusion of carbon crediting mechanism.		
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## 5.4 The role of private sector

The cap-and-trade systems are increasing in many countries. We can try to know how the corporate sectors are impacted of these countries by the carbon markets. It has been argued well by the scholars that cap-and-trade schemes have small and positive financial impact on the corporate sectors and this is changing.<sup>129</sup> Considering free distribution, auctioning, sectoral approach and installation, the effect of carbon markets on companies depends significantly on the maturity of the specific market, the rules and the distribution methods and costs as well. The EU ETS has different phases that permit for market developments as we see during the initial two phases there were a more or less positive impact on the corporate sectors but all distributions became more rigid the gap is increasing between the high performers and low performers.<sup>130</sup> It may be similar phased improvements in all other schemes.

The financial implications for the private sectors under the new carbon compliance markets that are extending to developing nations throw a question that, will China

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<sup>129</sup> See more on the issue ' How do companies do business in a carbon constrained world: investment decision and bottom line': Ernst and Young (2012)

<sup>130</sup> See IESE Business School for Ernst and Young (2012) : 'The future of global carbon markets'

and Korea turn to be costlier after the introduction of the carbon regulation? Is there any advantage to invest in these rising market and how speedy the economic gap slender? The type and scope of global agreement can be taken into account and also the matter to be considered that markets will be connected or not. The economic escalation rate becomes more influential than the execution of carbon legislation considering in small to medium term.

### **5.5 Impact during the period 2013 to 2020**

It is defined that most of the businesses will not be affected by the carbon markets till 2020. China, South Korea, Australia and the US will be looking at putting up a carbon management policy, observing emissions, learning trades and lobbying.<sup>131</sup> As it demands to put limited options for abatement, the aviation sector seems to be affected but expenses can be transferred to customers. The aviation sector will be negotiating for a global approach through the International Aviation Organization. National interests come first rather looking at the greater picture regarding the inclusion of the aviation sector in the EU ETS that creates international disputes. Countries like China, the Us, South Korea and Australia who are in the way of carbon markets plan-processing, companies in the growing markets will also require to initiate the preparation as economic power shifts from developed to developing such as China and India and this put both pressure and responsibility on them. China seems responding as it is ready to accept targets after 2020 and planning a

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<sup>131</sup> See more on the issue as discussed in ' How do companies do business in a carbon constrained world: investment decision and bottom line': Ernst and Young (2012)

domestic cap-and-trade system by 2015. India also has initiated domestic climate strategy and executed market mechanisms though this is run by susceptibility to climate change but it impacts the economics.<sup>132</sup> It looks that, China and India will be catching up first but countries from Africa and Latin America are also very near.<sup>133</sup>

It is significant to look at whether companies are going to be affected in the same way under carbon regulation in the EU, California and China. Considering the maturity, experience, targets will be more rigid in the EU but it is not likely reason that they will take costly low carbon measures as that is to be defined by the carbon market. However, as we discussed about the link of carbon markets before, without linking the EU ETS with the California and China ETS, carbon price is going to be dissimilar in every system and the prices is going to be subject to the market fundamentals (e.g. fossil fuel price, rigidity of targets, weather vacillations and economic situation). Therefore, Chinese companies would be subject to higher carbon prices and they will be more disposed to implement reduction measures and considering the maturity market price will also be higher in the EU in the coming period.

We noticed that carbon price changes noticeably and reached over €30 per ton CO<sub>2e</sub> in 2008 when during the past couple of years the so called European Union Allowance price (EUA) did not exceeded €15-€20 (US\$19-US\$26) per ton CO<sub>2e</sub>.<sup>134</sup>

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<sup>132</sup> National Action Plan on climate Change(NAPCC): 2008

<sup>133</sup> Look The Economist: September 2011: 'The World Economy- a game of catch up'

<sup>134</sup> See IESE Business School for Ernst and Young (2012) : 'The future of global carbon markets'



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Looking at the urgency, next reduction opportunities need prices importantly higher to motivate industries to put the required investment decisions. Because of the policy improbability after 2012 and the debt crisis in the Eurozone, contemporary EUA price levels are below 10 Euros per ton CO<sub>2e</sub> and secondary Certified Emissions Reduction (CER) below €2 per ton CO<sub>2e</sub>.<sup>135</sup> Eventually, this influences to limit low carbon actions to the cheapest options on the reduction curve. As a result industries are motivated to buy carbon credits from the market and damaging investment in another option.

Scholars and analysts project that the market price is going to be recover during the 3<sup>rd</sup> phase of the EU ETS. To take into account the market fundamentals, the mentioned price range €10-€25 per ton CO<sub>2e</sub> in the period 2013 to 2020.<sup>136</sup> Projections before the economic crisis showed even higher. The UK governments put it around €40 per ton CO<sub>2e</sub> in 2030 and over €100 in 2050.<sup>137</sup>

The politic and distribution rules around the sectors will also be included by the business (e.g. power sector). The EU ETS focusing the aviation sector while California is considering residential, commercial and transport fuels. So we see industries affect differently in the international level than domestic level. Moreover the EC took decision to safeguard some particular sectors from competitive distortion outside the EU as the EC is providing them 100% of free permits till 2020.

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<sup>135</sup> On the basis of September 2012 price level see [www. Pointcarbon.com](http://www.pointcarbon.com)

<sup>136</sup> See Societe Generale carbon price and Deutsche Bank Carbon price

<sup>137</sup> See <http://www.decc.gov.uk/en/content/cms/emissions/valuation/valuation.aspx>

So, we see that till 2020 the impacts on the private finances more often than not are related to the administrative and technical burden of entering an ETS rather than are related to the negative effects on the balance sheet of a company. When the Durban Platform will be executed, in the same time, businesses will get the chance to be engaged in the design and trials of the sized up market mechanisms with a view to capitalizing it later.<sup>138</sup>

## **5.6 What happens after 2020?**

What happens after 2020 is not certain and also not so urgent with our research but we just can discuss connecting our approaches to see the global perspectives in coming times. The burning topic of discussion about the Durban platform is that there are some uncertainties about what will be happening in the global carbon market mechanism that is also the aim of our research. The world gets 3 to 4 years to get to know about it. There are questions from different levels regarding that as well including, regarding the nature of commitments, market mechanisms to size up the emissions reductions, effects on the shape and scope of carbon markets as well as the carbon constrained in the US, China and the EU is similar or dissimilar.

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<sup>138</sup> See more on the issue IESE Business School for Ernst and Young (2012) : 'The future of global carbon markets'

The answers can be framed by many ways. The significant way is the three distinctive hypothetical scenarios.<sup>139</sup>

1. *Theoretical approach1: Ambition*

We can see theoretically an inclusive, apparent and go-getting multilateral agreement that will take place in 2020 where all the nations proceed towards the targets on an equity basis and there will be chief emitters and industrialized countries accept to decrease emissions when developing nations agree to minimize the amount of the system that results carbon emission. Our discussed new market mechanisms (e.g. NAMAs, bilateral and sectoral processes and REED+) are executed.

2. *Theoretical approach2: Weak agreement*

We can estimate a weak agreement in the global level that targets in such a way that will not bring any solemn national mitigation. Some new mechanisms may be executed.

3. *Theoretical approach3: No agreement at all*

We can also project there will be no agreement, unfortunately. The existing financial crisis goes up and the nations are quite busy with saving their own interests and other prioritized issues those would arise and they will put very little interest in the climate change mitigation. Basically, this will push

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<sup>139</sup> See the discussion and frames of the scenarios IESE Business School for Ernst and Young (2012) :'The future of global carbon markets'

us back to unilateral and bottom-up approach where a few ambitious countries and regions consider the issue gravely.

### **5.7 Details on the theoretical approach1**

A global climate treaty with a strong motivation ratified by all the countries (as the major countries are not the part of the recent Doha treaty) is the crying need by 2015. This top-down approach will make the issue booming with a very low carbon development on each levels concerned. This will bring a practical and transparent development in the carbon markets and there will be an establishment of global carbon market. In this global carbon market there will be a global price (or prices depending on the conditions apply). It will also include more and more nations to execute national market mechanism dominantly ETS and domestic offsets and its goal to link up in a larger and longer term will be nearer. After that sectoral approaches and mechanisms will be formed that will eventually lead to global systems.

For this hypothetical approach, sectoral credits mechanisms look an important device. It seems that it could be in the longer term only. We see that EU ETS has taken a standard initiative that it is taking this sectoral compliance approach into account in the 3<sup>rd</sup> phase of the system from 2013 though currently the developing countries have doubt and they don't support this ambitious step for including the voluntary sectoral offsets mechanisms in the UNFCCC procedure. Particularly they consider them as impending precursors to sectoral targets.

As we discussed before countries like China and South Korea are considering national emissions trading. Other developing countries are thinking about the systems those are related with targeted sectors. We find that sectoral crediting mechanism is considerably pilot schemes for sectoral trading systems especially national ETS and so, it look like that the developing countries tend to use this mechanism to experience first stage to have clear future decision making in the field. To encourage potential global carbon market, assisting and supporting sectoral procedures in the developing nations what the EU is doing is necessary. On the other hand, we see that many countries are taking cap-and-trade schemes seriously on the domestic level, these can be potentially also connected, may be, somehow through sectoral mechanisms.

Hypothetically, we consider the initial global sctoral schemes could be launched by 2020. We have noticed already that, meanwhile, aviation and shipping sectors are inspected and pave the path of our first sector to look targets. In the main, high carbon sectors that are capable of passing on costs can be considered as an idyllic applicant because they are, in compare to others, trouble-free to maintain and manage and also competitive issues will be less from the global procedure. Apart from aviation and shipping sectors, power generation, iron, steel, cement sectors also can be taken into account. However, it seems that sectoral systems can help for creating our expected global carbon market in combination of connecting emissions trading systems. Moreover, these global sectoral procedures will form a

field where private sector will play a certain role as we discussed extensively in our previous discussion. It looks that it does not come up with the principle called “common but differentiated responsibilities” that can be mentioned strongly from the side of developing countries.<sup>140</sup>

Our first theoretical approach will also open a new opportunity for the USA cap-and-trade systems and the Korea emissions trading system. Initially, in the USA, it is very significant to see that California ETS runs very efficiently and if it runs such perfectly for at least three years that gives the necessary trust and management information to government for creating federal carbon emissions market though the decision, as we have seen from our previous conversation, mostly depend on the House of Representatives and Senates. The indentified deadline for the decision on the post 2020 international climate change systems is 2015 and we know that is the year when China planned for its domestic emissions trading systems. It will give Chinese government to think deeply and positively for our intended future commitments. Now we can say that these new projects long with EU ETS will potentially form a huge demand for global offsets that is necessary to meet through proposed new market mechanisms because CDM alone will not be adequate.

This theoretical approach not only provides sufficient scope for global level of carbon markets but also it will be alluring to the private sectors when almost top companies are on a way to minimize carbon emissions scheme and rest of the

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<sup>140</sup> As argued in the paper and more on the issue IESE Business School for Ernst and Young (2012) :‘The future of global carbon markets’

world's top five hundreds industries will be considering for a certain period; as they have already taken initiatives for lobbying their respective governments through a proper channel.<sup>141</sup> Considering our discussion on the carbon regulation, we have noticed that many countries, states, provinces and local authorities are executing carbon regulation which will certainly impact the industries, companies and firms as the key parts of these industries are multinational, they understand that to lessen authoritarian indecision and amplify competitiveness, an international agreement is necessary to guide and connect this hodgepodge of local regulation. As a result, this theoretical approach is highly in their consideration rather than a varied, jarring bottom-up approach. This global level of agreement will create the surety and stability that is necessary for the influence private finance and stirring mitigation up the reduction curve expectation.

## **5.8 Theoretical approach2**

It is clear that a weak and vulnerable agreement will form an uncertainty for the businesses and it will hamper the investment as well as economic growth. Considering the market fundamentals, international supply of carbon permits and offsets will, eventually, surpass demand and thus carbon price will remain very low. As a result mitigation measures will be identified by the cheap side (left) of the

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<sup>141</sup> See more on the issue ' How do companies do business in a carbon constrained world: investment decision and bottom line': Ernst and Young (2012)

marginal reduction curve.<sup>142</sup> The steps might be taken by the initiatives and markets that will endeavor to connect with each other for achieving proficiency. As we can see that demand will not be enough, still, new market mechanisms may be started to put up offsetting. Thus, the prime motive of the carbon markets will not be successful as it will fail to kindle a bulk amount of reduction in a cost competent way.

In this theoretical approach, it will bring burdens for the private sector than opportunities because the bottom-up trend will look at the newly raised carbon markets around the globe with different rules, regulations and policies that eventually also brings heavy administrative burden.<sup>143</sup> Consequently, the private sector will not be benefited and carbon prices will be low that will give low incentive to the reduction of emissions; that minimizes the level of opportunities for the development of new services, investments and to obtain competitive advantages. Moreover, this approach will not be sufficient enough to limit the global temperature increase to 2°C that is the goal of UNFCCC. There will be other risks called “physical risks” a for instance scarcity in the natural resources and adaptation costs for companies will also be rising high. So this cannot be preferred approach that the world will want to go.<sup>144</sup>

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<sup>142</sup> As discussed in the paper and more on the issue IESE Business School for Ernst and Young (2012) :‘The future of global carbon markets’

<sup>143</sup> See more on the issue ‘ How do companies do business in a carbon constrained world: investment decision and bottom line’: Ernst and Young (2012)

<sup>144</sup> See more details Climate Action Tracker (2011) at <http://www.climateactiontracker.org/>



### **5.9 Third theoretical approach**

This approach fully shows that the international society completely fail to form a multilateral agreement.<sup>145</sup> It clearly indicates to go back and there will be bottom-up approach taken by some nations and local authorities where they will work very slowly. The EU emissions trading system and Californian cap-and-trade schemes will go forward but again in a slow pace and other countries will execute new actions but not so vigorously where the general action like Kyoto Protocol is slow down. Eventually, global financial mechanisms will not be so strong but limited scope where there will be countless of rules and regulations. Internationally, “security of supply and self sufficiency” will emerge as the main runner of low carbon action and there will very insufficient climate change concerns.

### **5.10 The most suitable theoretical approach: a compatible global carbon market**

The active and perfect global carbon market needs a global climate treaty with longer commitment that will set up strong domestic policies as the theoretical approach<sup>1</sup> shows clearly. It will create a compatible global carbon market with clearness, stability and continuity for private investment. Thus it will form a global field for the players (carbon constrained firms) as, looks so, will be less hesitant to execute more rigid actions and will grow their ambition. This ambitious approach

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<sup>145</sup> See Ernst and Young (2012): ‘Climate change post Durban’

also opens a path for forming high carbon price levels increasingly after 2020. These outcomes or progresses will be extensively slow in other two approaches as nations will be afraid of competitive issues and finally carbon prices will be slow. Moreover approaches like 2 and 3 will destabilize economic efficiency with uncertainty and insecurity. It is not clear enough in these two approaches, especially in the 3<sup>rd</sup> approach, whether the effect of climate change will motivate industries and firms to shape appropriate policies and the national bottom-up policies will be running without any interruption and it is improbable that, the industries will be on a level-playing-field; and so global carbon price will be diminished. Finally, again, we have the theoretical approach<sup>1</sup> that satisfies our thirst most suitably for forming global carbon market.

## **5.11 Adjustment**

In our discussed approaches to the future global carbon market adjustment is crucial. Especially, considering the 3<sup>rd</sup> approach, climate change mitigation reaches at a vulnerable and unfavorable zone where the physical risks will affect the private sector. It is not foresighted when severe weather may interrupt supply chains and injure physical assets and also it looks like that sourcing will become challenging and water shortage will increase costs and obstruct with manufacturing. As a result

it will create very hard challenges for the developing countries.<sup>146</sup> Considering these physical effects of climate change, there will be an urgent need for higher risk management abilities. It is also necessary to vigorous forms that cover the different threats as far as industries are exposed. It is necessary for the industries to develop adjustment strategies that will encompass the progress of new services, investments and products and also they need to think about the effects on the supply chain; resource dearth will affect their underneath issues. Active businesses will get a significant strategic benefit and they will create value from it. Again, considering the best preventive approach, like the approach situation arises still the companies need to consider adjustment mechanism sincerely.

## **5.12 Scopes for businesses**

Apart from the theoretical approaches, the global path towards low carbon economy is absolutely complicated and elongated; even there would be a transformation of mentality and responsiveness.<sup>147</sup> Advanced companies are adopting advanced risk management strategies and regularly collecting the updated on the climate change issues. Somehow they are also taking part in action for making the carbon markets effective and proficient. To sketch an efficient Bilateral offsetting Crediting Mechanism, the Japanese decision makers are working and dealing together with companies, for example Mitsubishi. The EC is also working

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<sup>146</sup> more on the issue IESE Business School for Ernst and Young (2012) : 'The future of global carbon markets'

<sup>147</sup> Source IESE Business School for Ernst and Young (2012) : 'The future of global carbon markets'

together with petroleum industries for instance shell by an execution framework for Carbon Capture and Storages (CCS) under the European Technology platform for Zero Emission Fossil Fuel Power Plants (ZEP). To develop their own ETS system the South Korean decision makers have asked the European businesses for cooperation. Moreover, the multinational companies consider the chances greatly regarding the size up of carbon markets, particularly, with the NAMA developments in future.

As we identified evidently that, apparent market signals will bring effective private sector participation in huge investment in the emissions abatement programs. For releasing the potential capital markets with a view to funding the billions of dollars, financial improvement is a key that is necessary to transform the respective economies to a low carbon system when the craving is there. We see that, in spite of economic downturn, the international investment in clean energy and technology increased by 30 percent to US\$ 243b in 2010 and “Cleantech” investment offers an important and innovative opportunity as well as they give a means for companies for dealing with a several issues for instance energy security and prices, natural source shortage and policy risk.<sup>148</sup> The advanced industries are considering the inclusion of the potential carbon prices in their future decision making procedures for instance if we consider the present investments in Carbon Capture and Storages (CCS) that will not be a healthy business case taking the present level of carbon prices into the account. As we discussed previously, Shell

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<sup>148</sup> Source World Economic Forum

believes this technology will be financially sound in the future carbon price situations. Specifically saying, a recent survey finds 54% of the companies believe that dealing with climate change is a great chance for their businesses and in the same way the survey expresses that there are several companies those are not sure about how they will take advantage of climate change linking with investment.<sup>149</sup>

## ***6. Conclusion***

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### **6.1 The ultimate scenario**

Nations, Companies, Industries and most importantly businesses should be prepared for the future global carbon market when they will be carbon-controlled. The countries, companies, industries and firms which are, at present, actively connected with the mission of low carbon and adjustment strategies and policies will obtain a competitive advantage and certainly, will be benefited later, especially, when the countries which they run and execute carbon policies. We see unlike some advanced industrial countries, developing countries are taking part actively in executing national climate strategies as they are in the real situation to be harmed

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<sup>149</sup> See for more on the survey Ernst and Young (2011): 'Durban dynamics: negative for progress on climate change.'

by the climate change. It is evident that these policies, eventually, will be full-fledged and matured quickly and evolve over the years are coming.

Moreover, we see a growing number of developed and developing countries have already took initiative or taking initiative to execute carbon taxes seriously and the sectors which are affected by these changes for instance utilities look to get ahead of the cost of carbon to their respective customers. The participants who expect carbon constraints have to obtain much and refitting their tools early as there are few options like permits will be resolute through standard or historical data.

As we discussed, a global carbon market will form a “level-playing” field for the industries and companies and overall for the countries. At the beginning it seems that this market will be comprised of certain sectors though those are only a number of actors globally but the theoretical approach<sup>1</sup> shows it ensures the growing security. However, it also seems that a regulatory certainty is one of the key factors in decisions on clean technology investments. We have to take in mind from the very beginning to the last of our discussion that it is authority or policy makers who create can faith, security and stability in the markets and incentives for expecting extensive and durable investments. A vigorous international climate agreement in connection with likewise striving and harmonizing unilateral policies are the most effectual and efficient way of gaining that trust and solidity. We have also seen that, Most of the companies will certainly prefer meticulous, well-sketched, translucent and elongated global carbon regulation and thus a burly

global agreement on climate change mitigation is the prime interests of the business sectors.

From our conversation, it looks clear that global carbon market is the key system of the upcoming huge climate financing if it is formed in a way that theoretical approach<sup>1</sup> suggests. There are many expectations and aspirations from the growing global carbon market. The expectations come with the conditions that the market needs to be effectual and efficient. Scholars and analysts believe that for this, it is necessary to have higher mitigation targets for Annex I countries for the global carbon markets.<sup>150</sup> We also see that emissions trading system in China, the US, the EU and other countries will increase demand for global offsets. Moreover, the decision taken at COP 17 is blueprint to intend new and market based system can incorporate a general nucleus set of regulations and processes at the global level to permit various shapes of national execution. The planned and existing mechanisms must be coexisted and should sustain NAMAs.

## **6.2 Final points**

We have, however, projected that, with the development of carbon market and the emerging new market mechanisms, there will be an inclination among the participants to link markets (that already started) and to form a partial “level-playing field” which is the precondition of a true and compatible global carbon market but we cannot expect a compatible global carbon market developing soon

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<sup>150</sup> Source IESE Business School for Ernst and Young (2012) :‘The future of global carbon markets’

where all participants are constrained equally. Anyway, our research also shows that improvement is aggravated by the huge economic inequalities that exist between advanced industrialized and developing countries. There we noticed an incapability or unwillingness of the related decision makers. They do not think beyond national interest and importance. They do not want to see a greater picture of a greater good.

As we have structured our research by the naissance support of contemporary studies on carbon markets, that initially global carbon market can be a system concerned with the developed and industrialized countries who will be carbon constrained in the national level; and on the other hand developing countries will be offering offsets on a big scale through effective and proficient market system. It is found that political reasons thwart a synchronized system from budding but, most probably, it will still happen by connecting national markets. For walking towards the goal of “low carbon economy”, we need a vigorous carbon price and this price on the carbon emissions will guarantee the operation of the mitigation actions on the basis of marginal reduction curve. Then this will bring investments and high chances for the private sectors with stability and security of the market itself when financial improvement is a significant way of opening capital markets for financing the “billions of dollars” of private sector investment that is very necessary to renovate our economy to a “low carbon model”.



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There is only a way for reaching this picture. The private and public sectors should work together. They cooperation need from each other and they should take the lead combined as private sectors, this or that way, are also getting engaged with the development of carbon regulation around the globe. Along with challenges, there are endless benefits waiting for them.

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