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China and Renewable Energy: A Policy Analysis. Focus on Wind Energy.

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Abstract: Starting from the 21st Century, the world has become increasingly concerned with the global environmental degradation issue, which appears to be in a state of irreversible crisis. It has been twenty years since the Earth Summit in Rio de Janeiro, and humanity is still on the road to achieving a sustainable future. Although governments are eager to find a concrete solution for the global environmental emergency which jeopardizes the prospects of future generations; the global decision making process has found difficulties in achieving consensus. This paper will analyze the sustaining policies, which support and encourage the increase of renewable energy consumption and production in China. This country plays today a major role in the struggle against climate change due to the impact of its fast economic and demographic growth. In order to effectively highlight the policies and goals of renewable energy in China, wind energy will be analyzed as a case study. China is promoting renewable energy with the support of its policy, reaching diverse results on the consumption and the production availability of it. Indeed in 2010 China reached the first global position in production and consumption of renewable energy, where the production is much higher than the consumption. There is a gap between what the country produces and what it is able to use. As China has a big capacity on wind energy development; it is important to understand why China can't consume as much energy as produce.

Keywords: sustainable future; renewable energy policy; wind energy; China.

1. Introduction

It is evident that there is a global-wide crisis taking place that will inevitably lead to disaster: "..a combination of a global financial crisis, a food crisis, volatile oil prices, accelerating ecosystem degradation and an increasing number of climate-induced extreme weather events."[1] With that being said, it is very important that these issues are brought to the attention of all governments and citizens around the world during this critical time. The solution to this crisis requires increased consciousness and awareness regarding the issues, coupled with constant search for remedies. This will help solve these global crises and ensure a peaceful and sustainable future.

It is essential to understand the importance of sustainable development to promote a secure future. The topic of "sustainable development" has become particularly important in numerous international forums. The expression "sustainable development" appeared for the first time in 1987, in the Report of the World Commission on Environment and Development. This report defines "sustainable development" as a type of development which satisfies present-day demands without endangering the needs of future generations.[2]

In order to address environmental problems while also helping to ensure a sustainable future, Agenda 21 (1992) was established in 1989 with the approval of the UN environmental conference in New York, culminating in the international conference in Rio de Janeiro in 1992. In 2000, with the unanimous endorsement of the United Nations, an agenda of eight Millennium Development Goals (MDG)[3] was designed to aid developing countries to guarantee a sustainable future. The first global conference focusing on the topics of climate change and the environment, took place at the Rio Earth Summit, in 1992, in Rio de Janeiro, Brazil. The result of the conference led to the agreement of all the member nations and stressed the necessity to find a solution to preserve the earth's environment in order to ensure a safe future for the population. In 2012, Brazil had once again host the Earth Summit, which has been focused on the international efforts that need to be made in order to achieve a sustainable growth on the global scale.

It is important, in this context, to understand and be focused on the change of the world balance in terms of the growth of regional and global economic powers. The incredible fast and uncontrollable development of emerging countries, like China has a direct consequence on the incising of environmental degradation and the climate change issue due to the high amount of energy consume. Indeed, China is promoting different policy plans to fight against global warming. In order to effectively highlight the differences in the policies and goals wind energy will be analyzed as a case study.

Asia, today, represents a giant in relation to environmental hazards, with a specific focus on China

1 EarthSummit 2012
http://www.earthsummit2012.org/beta/background.
2 G. Bruntland, "Our Common Future: The World Commission on Environment and Development", *Oxford University Press*, 1987.
3 Millennium Development Goals Report 2009 (Spanish version) United Nations, 2009.
http://www.un.org/spanish/millenniumgoals/documents.html.

due to its size, growth, and its potential damage on climate change.[4] The attention on this country arises from their rapid economic growth, without regard for environmental issues, which is in contrast with the Western ideas. The Chinese populations have reached around 1.3 billion of people, and as a result, the need for energy is growing very fast. The country consume primarily coal energy and it consequentially represents as the dominant world producer of CO2. This means that China is become the biggest incrementing author of global warming and climate change; attracting world interest and fear. Renewable energy is considered to be a better solution to this problem and China is making plans to not only increase their use of this type of energy, but also make sure that it is readily available on a daily basis. [5]

1.1 Research Question

China is promoting renewable energy with the support of its policy. China reached, in 2010, the first global position in production and consumption of renewable energy, where the production is much higher than the consumption. There is a gap between what the countries produce and what they are able to use. Indeed China produces more renewable (and wind) energy that it consumes. Why China can't consume as much as produce on the renewable energy?

For what concern the wind energy global development, China is playing an important role. Since 2005 Germany has head the world wind power situation, followed by Spain, USA, India, and China. The wind installation capacity situation started to change significantly in 2008 when USA gained the first position, and China surpassed India. Since then, grew aggressively surpassing all the others countries in 2010. Current strategies for long-term sustainable development and renewable energy scenarios require a more in-depth research effort on technology, a cost decrease and an efficient and stable policy supports on production and consumption to allow the daily availability of renewable energy and to replace the coal use.

2. Results and Discussion

"The Renewables 2011 Global Status Report", defines renewable energy as energy that is produced and replenished by natural resources. This includes biomass, hydropower, wind, solar, geothermal and bio-fuel energy.[6] Escalating the use and production of renewable energy will increase energy security and environmental protection while decreasing the CO^2 global production. The major cause of environmental pollution around the world is the high amount of fossil fuel which is used as predominant energy in the world. The increase of renewable energy has the ability to change the global energy market, increase the adoption of clean technology, and create a huge high-tech industry market. In this sector, China is making progress towards becoming global leader. China in particular has been making significant advance in this manufacturing since 2008. From the time when the fossil fuel started to be less available, renewable energy sources (RES) took on more meaning internationally.
China is the world's largest energy consumer with 2492.7 Mtoe of energy consumption in 2010, followed by United States with 2248 Mtoe.[7]

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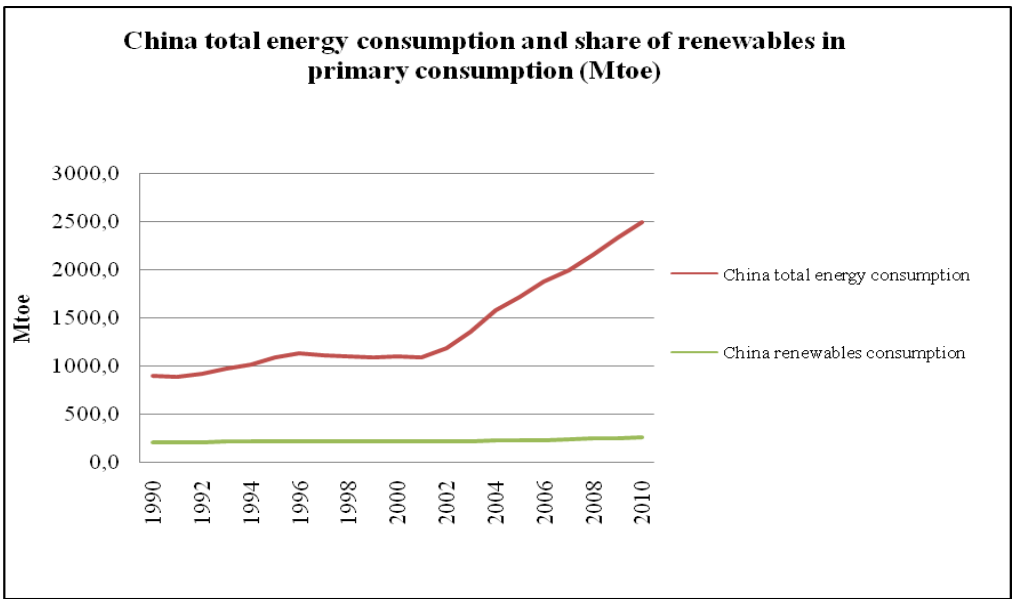
4 S.Walsh, H. Tian, J. Whalley, M. Agarwal, "China and India's participation in global climate Negotiations", Springer Science+Business Media B.V. , 2011.
5 S. Vihar, "Renewable Energy Development in India", Crux Consultants, 2009.
6 The Renewables 2011 Global Status Report,
http://www.ren21.net/Portals/97/documents/GSR/REN21_GSR2011.pdf.
7 http://yearbook.enerdata.net.

In 2010, China produced, 402,0 Mtoe of renewables in electricity and consumed 266,7 Mtoe. There is a gap between what the country produce and what it is able to use.[8] In the case of China there is a big waste on the production, which reached, in 2010, 135,3 MW, due to the inefficiency of transfer the energy produced by the incomplete grid connection. China produces more than what it consume. Indeed, China consumes 66,3% of the renewables in electricity production.

When transforming the percentage of the Chinese share of renewable energy in primary consumption in Mtoe value and assuming as an absolute value the total energy consumption, it appears that the value of renewable primary consumption remains stationary during 1990-2010. It grows from 211,3 Mtoe to 267,3 Mtoe, between 1990 to 2010, while the Chinese total energy consumption during these 20 years grows from 901,5 Mtoe to 2492,7Mtoe (Figure 1). The Chinese shares of renewable energy in primary consumption from 1990 to 2010 appear in a static position, while the total energy consumption increases significantly in China.

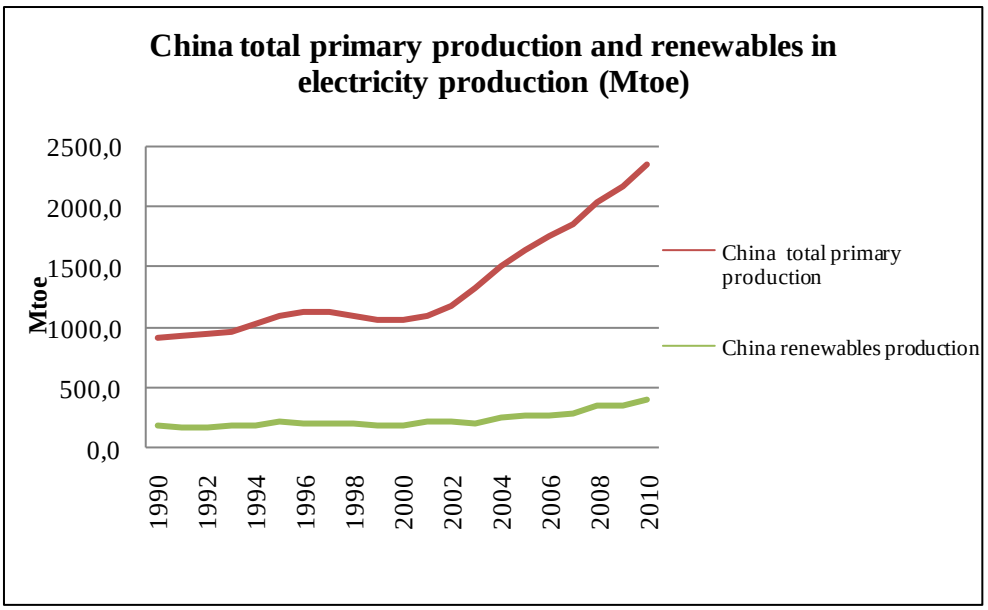
Figure 1. China and India total energy consumption and share of renewable in primary consumption (Mtoe), Source: http://yearbook.enerdata.net



When transforming the percentage of China's share of renewable in electricity production in Mtoe value and assuming as an absolute value the total primary production; the value of renewable energy in electricity production appears to have a large growth period from 1990-2010. It grows from 188,6 Mtoe to 401,1 Mtoe, between 1990 and 2010, while Chinese total primary production during these 20 years grows from 924,3 Mtoe to 2351,1 Mtoe (Figure 2).

Figure 2. China and India total primary production and share of renewable in primary consumption (Mtoe); Source: http://yearbook.enerdata.net

8 http://yearbook.enerdata.net/



Both the total energy consumption and the primary production are in fast growing in China, while the renewable in primary consumption appears stationary and very low compare to incredible total energy consume amount in Mtoe; otherwise the renewable in electricity production appear growing but too slowly to reach the total in primary production. These results about the development of renewable energy during the last twenty years are not positive: as China is the first global producer of renewable energy, the country appeared in a very slow and stationary position in relation to it.

2.1 China's national policy on renewable energy

The Chinese energy sector has a global interest and consequences for different issues and Andrews Speed in the "Energy policy and regulation in the People's Republic of China" mentions six of the most significant. The first issue, is that China is the largest consumer of energy in the world, second, the Chinese have a strong impact in the global energy market, third, China is a the major contributor to the atmospheric pollution; fourth, China represents an attractive place for international investments, fifth, the domestic Chinese companies sell and invest overseas, and lastly, China maintains a balance in its global energy policy.[9]

In the "Environmental Law and Policy in the People's Republic of China", Stefanie Beyer mentions that the Chinese environmental issues and policy agreements started with the beginning of the People's Republic of China in 1949 and since then, they have evolved slowly and through different periods in time. Between the 1950s and 1970s unimportant agreements were made regarding environmental issues, and very few arrangements were made regarding "mineral resources and factory safety, including provision in water pollution prevention and waste discarding."[10] During that time, Chairman Mao didn't plan any policy regulations related to the environmental protection, for he was just focused on the rising of the Chinese economy and on the realization of the policy of the "Great

9 A. Speed, "Energy policy and regulation in the People's Republic of China", *International Energy and Resources Law and Policy*, 2004.
10 B. Bachner, "Regulating Pollution in the People's Republic of China: An Analysis of the Enforcement of Environmental Law", *Chinese Journal of International Law*, 1995, 29:789.

Leap Forward" policy. It was only in 1972 that China decided to take part in the United Nations Stockholm Declaration of the human Environment, after severe inundations and droughts problems. That period concedes with the reforms of Deng Xiaoping of the opening economy and the consequence starting of the Chinese economy growth. In 1978, the Chinese Constitution added the responsibility for the environmental protection: (Art.9) ''The State ensures the rational use of natural resources and protects rare animal and plants. The appropriation or damage of natural resources by any organization or individual by whatever means is prohibited''[11] and (Art.26) ''The State protects and improves the living environment and the ecological environment and prevents and controls pollution and other public hazards''.[12]

Unlike other countries where energy pertains to the economic sector, in China, energy is an issue of the government control and of state ownership.[13] The Chinese national policy has been implementing environmental defense procedures since the 1980s. In 1984 the first Environmental Protection Committee was established and subsequently in 1989 the first Environmental Protection Law was successfully formulated. In 1988 the Ministry of Energy was created to manage the policy and control the energy in China. Five years later, it was cancelled because it interfered with other departments. After Earth Summit in Rio de Janeiro in 1992, the Chinese Government claimed: "After the United Nations Conference on Environment and Development in 1992, China was one of the first countries to formulate and carry out a strategy of sustainable development."[14]

The first authoritative policy regarding the energy in China was when the National Development and Reform Commission (NDRC) was founded in 2003, and later led by Zhang Ping. The Main functions of NDRC are to organize, study and control the economic and social development of the country and to maintain the balance of the economic development.[15]

In 2005, the Renewable Energy Law (REL) was announced by the National Congress People's. It included different regulations, support, and guidelines with hopes of preserving and deploying renewable energy. The price of the renewable energy availability was decided by the government and not by the market. These price organizations ensure the government monopoly on the renewable energy market.

In 2008, the National Energy Administration (NEA) proposed that the government properly regulate the energy use and production in China. The NEA was establish under the direction of the National Development and Reform Commission (NDRC), and it had the duty of ensure the energy needs, the energy safety and to incorporated the supervision of energy industry in agreement with NDRC. In 2010, the National Energy Commission was formed by the government to coordinate the energy policies. It includes 23 members between central bank, NDRF and agencies. The function of the commission is to develop a strategy for the development of energy use and production in accordance with the energy security, in concordance with the climate change, the carbon reduction, and

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11World intellectual property organization, *China The Constitution law of the People's Republic of China*, http://www.wipo.int/wipolex/en/details.jsp?id=6634.

12 Ibid.

13 A. Speed, "Energy policy and regulation in the People's Republic of China", *International Energy and Resources Law and Policy*, 2004.

14 Chinese Government's official web portal, http://english.gov.cn/2006-02/08/content_182528.htm.

15 National Development And Reform Commission (NDRC) People's Republic of China , http://en.ndrc.gov.cn.

energy efficiency stipulated by global decisions.[16] The director of the NEC is the Chinese Premier Wen Jiabao.

On March 14, 2011, China launched the 12th Five-Year Plan (FYP) stipulated by the Chinese National People's Congress and the Chinese People's Political Consultative Conference with a strong attention on China's green development. This is considered to be "Greenest FYP in China's history" because it has a lot of concerns related to the environmental issues.

The 12th Chinese Five-Year Plan underlines the necessity to make a turning point, from relying on the previous support of immeasurable economic growth, to a new prioritizing on measures and strategies to ensure a sustainable future.[17] Targets of the plan include resource and environmental protection, and a focus on the energy, pollution, water, forestry and climate change issues. The FYP provides a 16% cut in energy intensity (energy consumed per unit of GDP), a 17% cut in carbon intensity (carbon emitted per unit of GDP), and a raise of non-fossil fuel energy sources to 11,4% from the current 8,3%. Also, it focuses on the grid connection, proposing the project of building a long distance connection for renewable energy, which will reach in 2015 200000 Km of distance. The twelve FYP introduced projects for the construction of 120 GW of hydropower, 5GW of installed capacity form solar energy, and 70 GW of wind installed capacity by 2015. It provides the project of about 35000 km of rail to connect different regions of the country.[18] Furthermore, there is a debate about carbon taxes and carbon trading which are widely discussed and it will be probably introduced in the next five year plan.[19] The Chinese Ministry of Finance has publically claimed to introduce a carbon tax probably from 2013 and it will have its own characteristics different than the ounces used by developing countries; following the principle "common but differentiated responsibilities".[20]

The grid connection is a fundamental aspect for the implementation and support the use of renewable energy but in China, the grid system doesn't work properly. There is a lack between regions connections and it still inflexible on changing the structure. The Chinese government, recognizing the grid connection problems and limits, introduced diverse measures to improve this issue. The Chinese state Council created the Supervision and Administration Commission (SASAC), which implements the state ownership of enterprise (SOEs). The State Power Corporation of China has the monopoly on the two grid companies: the State Grid and the China Southern Power Grid. The Chinese State also owns the "big five" power generation companies: China Guodian Corporation, China Huaneng Group, China Datang Corporation, Huadian Corporation, and China Power Investment Corporation.[21] At the same time, the provincial and the citizen government of China developed their proper jurisdictions to apply their ownership on the energy power.

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16 The Washington Post
http://www.washingtonpost.com/wp-dyn/content/article/2010/01/28/AR2010012800152.html.
17 KPMG, China's 12th Five-Year Plan: overview, (March 2011),
http://www.kpmg.com/cn/en/IssuesAndInsights/ArticlesPublications/Documents/China-12th-Five-Year-Plan-Overview-201104.pdf.
18 S. Ladislaw and J. Nakano, "China leader or laggard on the path to a secure, low-carbon energy future?", *Center for strategic&international stidies(CSIS),* 2011.
19 China's Green Revolution, energy, environment and the 12th Five-Year Plan
http://www.chinadialogue.net/UserFiles/File/PDF_ebook001.pdf.
20 A Lin and F. Yang, "China's carbon tax is very real*", Climate Spectator, a Business Spectator publication,* February 2012,
http://www.climatespectator.com.au/commentary/chinas-carbon-tax-very-real.
21 Policy DB Details: China, "Renevable energy and energy efficiency partnership", 2010, http://www.reeep.org/index.php?id=9353&text=policy-database&special=viewitem&cid=149.

The big step to improve the energy efficiency came between 2002 and 2005, during China's economic growth and their decision to join the World Trade Organization (WTO). The participation with the WTO designed a new era for China which included: the incredible increase of the international trade and the consequence industrial rising development and the incising demand of energy. China started to focus, during this period, on the modern energy efficiency and, soon, the Chinese government introduced its Eleventh Five-Year Plan which focused on the necessity to decrease the energy intensification.[22]

2.2 Wind energy

Wind energy is the kinetic energy of the air in motion converted into electrical energy by a wind electric generator using a rotor, a gearbox and a generator to produce electricity.[23] Humans have used wind power since the first sailboats around 5500 years ago and a long after, during the 7th century for pumping irrigations and for grain milling. It was only in the 20th century that wind energy was harnessed to produce power for small residences and farms.

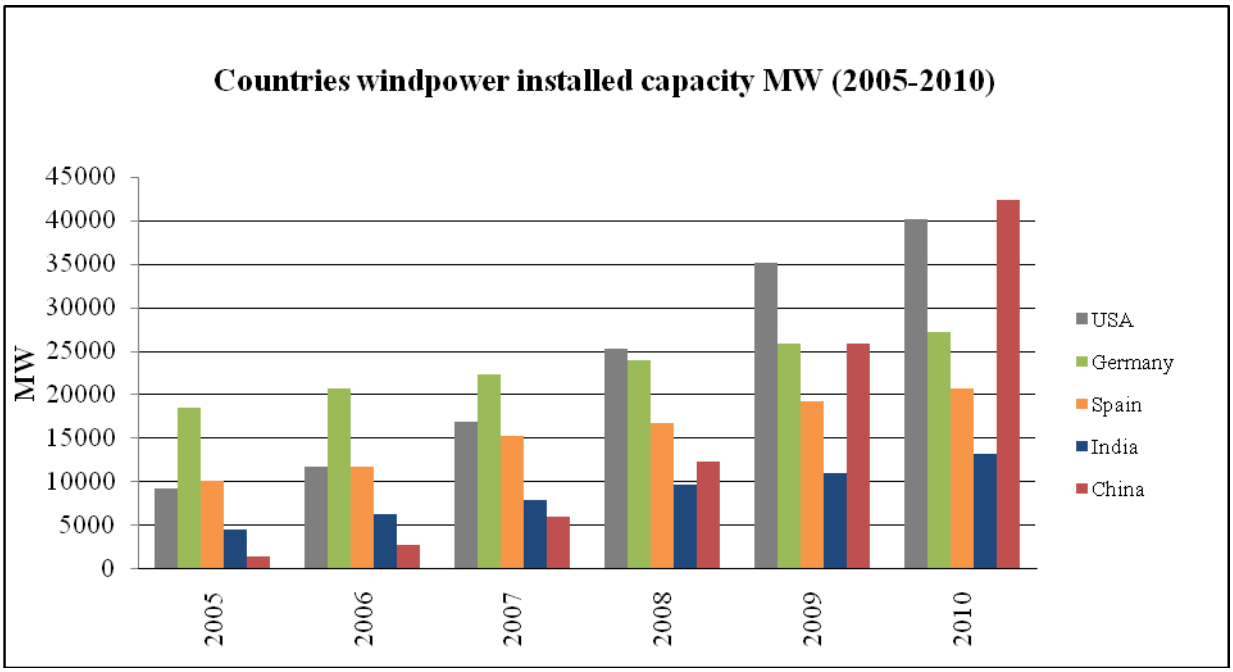
Wind energy is a renewable, predictable, clean energy source and also the cheapest source of electrical energy. It is considered as one of the most practical renewable energy. Indeed it is practically permanently available in virtually every country in the world. At the same time, it doesn't cause geo-political dependence on importing fuels from other countries. Also, wind power can be deployed a lot faster (about 2-3 months) than other renewable energy supply technologies.[24]

In 2010, due to the economic crisis, which affected United States and Europe, the use of wind energy slowed down in numerous developed countries, leaving for the first time, the developing countries as the major producers of wind energy.[25] This situation shows China as the leader in wind market development. The global income of the wind sector, in 2010, reached 55 billion of US$, while in 2009 it reached 70 billion of US$. This decrease is also due to the competitive lower price of wind turbine and technologies introduced by Chinese wind market.[26]

The wind energy global development has show changes in the growth capacity by its main producers: Germany, Spain, USA, India and China. Since 2005 Germany has been playing an important role in wind power, followed by Spain, USA, India, and China. The wind installation capacity scenario started to change significantly in 2008 when USA gained the first position, and China surpassed India. Since then, India has become the 5th wind power producer in the world and China grew aggressively surpassing all the others countries in 2010 (Figure 3).

Figure 3. Countries windpower installed capacity MW (2005-2010)
Source: World Wind Energy Association (also www.wwindea.org or WWEA).

22 S. Ladislaw and J. Nakano, "China leader or laggard on the path to a secure, low-carbon energy future?", *Center for strategic&international stidies(CSIS)*, 2011.
23 Wind energy definition , Centre for Wind Energy Technology, http://www.cwet.tn.nic.in/html/information_gi.html.
24 Global wind energy council, http://www.gwec.net/index.php?id=137.
25 Renewables 2011, Renewable energy policy network for the 21st century, Global Status Report, www.ren21.net/Portals/97/documents/GSR/REN21_GSR2011.pdf
26 World Wind Energy Association, *10th World Wind Energy Conference & Renewable Energy Exhibition Greening Energy,* Converting Deserts into Powerhouses Cairo, Egypt,(October 2011), http://www.wwindea.org/home/index.php.



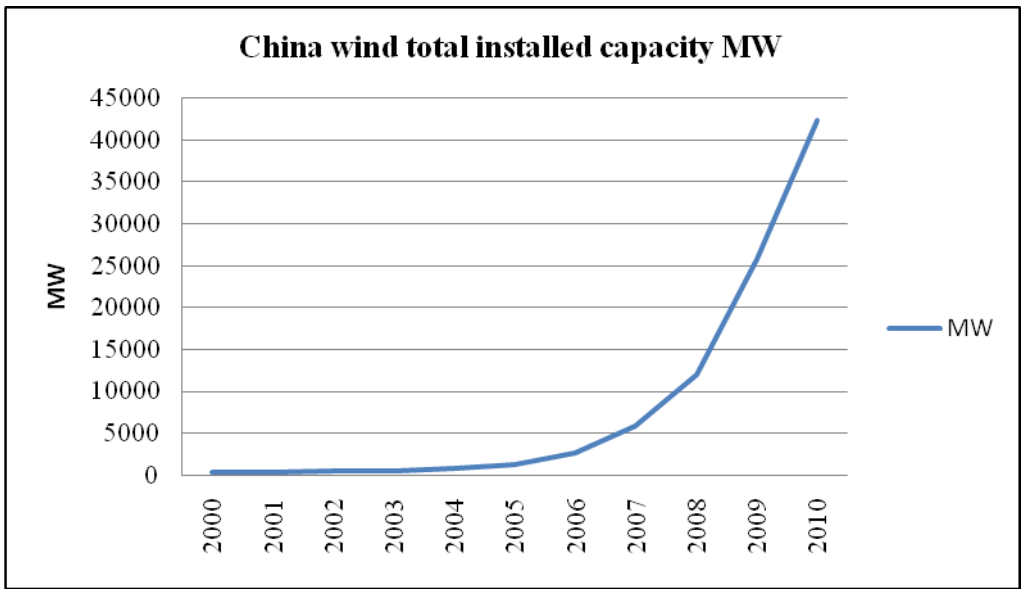
This actual expansion of wind energy is determined by China, which accounted, in 2010, for about 50% of the global capacity, while in 2005 it only accounted for 4% of the wind global capacity. The world is slowing increase the capacity of wind energy and the absence of competition with the fast growing Chinese wind market, can be attributed to the absence of consistent political increments and supports on wind energy consumption.

2.3 China's national policy on wind energy

In China the wind power development is still in an emerging stage and it represents an important challenge to replace the use of conventional energy in the country. China built its first wind farm on 1986 in Rongcheng, Shandong Province and from 1996 to 1999, the wind power development went very quickly. At the end of 2004, China had 43 wind farms with 1291 wind turbines and 764 megawatts of installed capacity.[27] Soon after these installations, the capacity of wind turbines in China increased rapidly reaching in 2010 42287 MW (Figure 4).

Figure 4. China wind total installed capacity MW
Source: http://www.gwec.net/index.php?id=125

27 Ecoworld ,Nature & Technology in Harmony, *Wind Power in China*, July 2006, from http://www.ecoworld.com/energy-fuels/wind-power-in-china.html.



In recent years, China has started to consider wind energy as an important and powerful renewable source and the related industry has grown the fastest in the energy sector of the country. The Chinese government constantly implements policies and regulations to sustain the improvement of wind energy. In 2010, China's wind industry became the biggest in the world market. As the World Wind Energy Association shows, China covered more than 50% of the global market on wind energy in 2010. China surpassed Denmark, Germany, Spain, and the United States, as the biggest maker of wind turbines. The main Chinese wind power companies are Goldwind, Dongfang, Sinovel and UnitedPower.

In this scenario the government plays an important role in organizing, implementing, supporting, and controlling the market. Indeed China, in 2001, lunched different supports projects to help and increase the domestic wind turbines. It is important to mention the "National Deb Wind Program", which is based on the reimbursement for the owners of wind farm using turbines produced domestically and a tax reduction for the use and incentives of local production of turbines parts. These incentives helped the local governments to support the exploitation of the turbines market to enter in the international competition. Today China counts most than 100 turbines manufactures enterprises, which are at the top of the international market supply. [28]

The policy support on wind energy industry development helped China to exploit in the international wind market and it help to creates many corporations based on wind market. These companies growth fast thanks to the profits stipulated by the government and gained by the providing of electricity, coming from wind energy, around all the country. Soon the wind industry has become so big to reach the first job supplier on the Chinese society.

The wind energy sector in China has become the bigger and faster growing in the world, thanks to the incredible increasing necessity of energy resource and to the strong policy support on the development of this market.[29] China is trying to replacing the use of coal, which has a negative

28 Rutkowski R. 16 June, 2010, "China's wind power has faulty connection", *China Business*, Copyright 2010 (Holdings) Ltd. Retrieved from http://www.atimes.com/atimes/China_Business/LF16Cb03.html.

29 "Wind power boom will benefit China Wind System's expansion ambitions", 2 June, 2010, *Interfax-China Energy Weekly*, Shanghai, China. Retrieved from

environmental impact, with the wind energy as the clean green energy supplier. At the same time the growth of the use of wind energy will help to recover the energy shortage in China, due to the big population need of energy. Regions with the most wind energy availability are the provinces of Inner Mongolia, Xinjiang, Gansu, and Tibet, which also represent the less populated regions of the country, where the necessity for electricity is low compared to the megalopolis of China.

The Chinese government instituted seven large-scale wind power bases in the country: Heibei, Inner Mongolia East, Inner Mongolia West, Jilin, Jiangsu, Gansu Jiuquan and Xinjiang Hami; which account for 83 wind projects.

According to the "China wind power report of 2008" by Li Junfeng, the country counts three significant stages for wind power development.[30] The first period is call the "burgeoning" period and it includes the years between the 1970s until 1997. During this time, the Chinese government started to focus their attention on smaller wind power projects to supply energy in rural areas of the country and soon, it started to increase the R&D for bigger turbines, and the development of the grid connection around the country.[31]

The second period is call the "nurturing" phase and it includes the years between 1997 and 2005. The main characteristic of this time is the implementation of the wind industry by a decisive booster of the government to motivate the wind power market. Due to the small amount of wind used, the government stipulated the price of the wind power. The last period is called the "blossoming" of wind power which started in 2005, and is being practiced up until today. The Chinese government promoted very important incentives in order to promote wind energy as a national goal. This includes the stipulation of the grid price, the imminent increasing of the grid connection, and the cost-sharing, which transformed the Chinese wind market into the most attractive in the world in 2010. The Chinese National Energy Administration invests in different provinces in order to reach the goal of increasing wind energy by 2020. This will be achieved by adding up to 138 GW to wind energy by this date.

Besides the onshore wind power obtaining impressive success, the potential for offshore wind power is even more superior; it has been expected to have the opportunity to reach until 750 gigawatts. It is important know that offshore wind speed is also more constant than onshore wind.[32] Indeed China is considering different projects developed by the support and negotiation between government and authorities to cerates state-owned offshore wind energy society. For example the government started cooperation with the State Oceanic Administration to create a project on offshore wind energy development. In 2011 the Chinese bigger wind energy developer, Longyuan Power, created the largest offshore wind project, which reached 99MW, in the east area of the province of Jiangsu.

4. Conclusions (M_Heading1)

The Chinese government strong promotes the production of renewable energy, but it doesn't put

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http://site.securities.com/doc.html?pc=CN&doc_id=265023135&auto=1&query=wind%3Aturbine%3A&db=en_1y_d&hlc=zh&range=365&sort_by=Relevance.

30 L. Junfeng, "China Wind Power Report 2008", *Beijing: Chinese Environmental Science Press*, October 2008.

31 L. Mastny, "Renewable Energy and Energy Efficiency in China: Current Status Prospects for 2020", *Worldwatch Report 182*, 2010.

32 S. Chen, Wind Energy in China, 2011, http://beyondeconomics.org/misc/wind-power-in-denmark/wind-energy.

the same efforts on the promotion of the consumption. It appears that China is more interested to compete and leading the international production market on the development of renewable energy. China produces more renewable (and wind) energies that it consumes due to the political decision and strategy on the support and development of it and to the finances and technical skills availability. China presents a big waste of the renewable energy production, which reached in 2010 135,3 Mtoe, due to the incapacity of transfer the energy produced by the incomplete grid connection. Analyzing the data available related to renewable energy and converting it in Mtoe, appears that China is the first global producer of it. However during the lasts twenty years the production and consumption growth in the country, excluding the Chinese production which is slowly growing, is static. Also comparing the Chinese total energy consumption and total primary production growth, in Mtoe, with the renewable in primary consumption and the renewable in electricity production growth , in Mtoe, the situation appear static, except in the Chinese renewable in electricity production. While analysing the Chinese data in term of share of renewable in primary consumption and of renewable in electricity production both are in decreasing, the first more than the second. This is due to the insufficient technical skills and to the unstable regulatory; which limits at the renewable energy to answer to the fast increase of total energy consumption.

These results about the development of renewable energy during the last twenty years are not positive: as China is the first global producer, the country appeared in a very slow and stationary position in relation to it. Current strategies for long-term sustainable development and renewable energy scenarios require a more in-depth research effort on technology, a cost decrease and an efficient and stable policy supports on production and consumption to allow the daily availability of renewable energy and to replace the coal use.

The actual expansion of wind energy is determined by China, which accounted, in 2010, for about 50% of the global capacity, while in 2005 it only accounted for 4% of the wind global capacity. The Chinese government, during the latest years, has strongly promoted the development of wind energy, creating the biggest global wind power market. Furthermore, China is starting to develop and increase the offshore wind speed. Despite the incredibly rapid growth of wind farming, China is facing a greatly disputed problem with its electricity grid connection, causing the slowdown or even uselessness of the harvested wind power. [33] The methodology used for calculating wind installed capacity needs improvement on the research and technology aspects of planning.

The development of renewable energy and in this case the wind power energy represents, in big growing countries like China, an aspect of the domestic economy to incentive the manufactory production and to answer positively to the global necessity of a sustainable way to reached the shortage of electrical power. Why China can’t reach the some renewable energy production and consumption? This is due to the Chinese strong polity strategy of support on renewable energy to increment this market and compete internationally but the less effort and interest on the finances of technical skills to make it easily available.

Acknowledgments

33 Global wind energy council, http://www.gwec.net/index.php?id=124.

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Conflict of Interest

"The authors declare no conflict of interest".

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