G:HUB Annual Policy Briefing

A Review of China's Climate Policies and Actions in 2013

2014/04

PUBLISHED BY: GREENOVATION: HUB
Climate and Finance Policy Centre
THIS PAPER CAN BE DOWNLOADED AT
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1. Introduction

Today, China is at a crossroads on many fronts – politics, the economy, society, the environment and international relations[1].

Through 2012 and into 2013, China underwent leadership changes and initiated various institutional reforms. The new leadership of President Xi Jinping and Prime Minister Li Keqiang will govern China for the next 10 years. With 2013 being the first year after they took power, many observers had high hopes that this would see the onset of "deep reform"[2]. This raises recent concepts such as Shengtai Wenming, or "Ecological Civilization", which highlights respect for nature and protection of the environment[3], and is backed by initiatives for developing ecological redlines, eco-functional zones and the eco-compensation mechanism[4]. President Xi has compared the task of "deep reform" to "chewing the hard bones". This includes the challenge of addressing the vast number of interest groups who over the last 30 plus years have accumulated significant political and economic power. Among these interest groups are the Party itself, governors and political powers at all levels, as well as the state owned enterprises (SOEs), and well-connected private enterprises. Xi's anti-corruption actions and campaigns around Party conduct and discipline have started to shake these groups[5] but clearly this will be a long and tough battle. China's ability to shift to a more sustainable and environmentally friendly development model is to a large extent dependent on the success of these reforms.

2013 was the mid-point of the 12th Five Year Plan (2011-2015), which created a path for China to deliver on its energy and carbon intensity targets. The result of the first two years was mixed[6] and left much to be done for the remaining three years of the plan. However, in 2013 many initiatives were further enhanced or implemented as planned, including the carbon market and industry energy efficiency programs. However, Beijing also felt the pressure from both domestic and international crises such as the ever-present and worsening smog across China and the solar dispute with the

[1] Lo Sze Ping, Li Lina, 2013. *The Second Year of the 12th Five Year Plan: A Review of China's Climate Change Policies and Actions in 2012. Greenovation Hub*.

[2] Xinhua Net, 2014, *"The Media Claims That the Reform Has Entered 'the Deep-Water Zone' and Needs to 'Proceed Rapidly and Steadily;"* [online] Available at: http://www.chinanews.com/gn/2014/02-06/5805022.shtml[Date of Visit: 2014].

[3] Ibid 1

[4] The Twelfth Standing Committee of National People's Congress, 2014. *Report of the State Council on Ecological Compensation Mechanism Construction Work.* [online] Available at: http://www.npc.gov.cn/npc/zxbg/gwygystbcjzjsgzqkdbg/node_21194.htm[Date of Visit: 2014].

[5] Xi Jinping, 2014. *Xi Jinping: Keep Carrying Out the Building a Fine Party Culture and Keeping its Organizations Clean and Anti-Corruption Fight.* [online] Available at: http://finance.sina.com.cn/china/20140115/052717955310.shtml[Date of Visit: 2014].

[6] Ibid 1

EU, to which they had to respond. Other local struggles that are close to people's lives, such as those affecting food, water, land, and health, all continued to accelerate, to a large extent, in 2013.

Up until recent years, there had been few opportunities for the general public to engage directly in policymaking – this is now changing. Alongside the "environmental crisis", public concerns over environmental problems are growing rapidly, as is environmental awareness in general. This has been triggered in large part by the boom of the social network in China. In 2011, according to McKinsey, China's social media users reached 300 million, the largest in the world at that time[7]. A 2013 survey[8] on the world's largest social networks conducted by BI Intelligence found that China's social network had grown even further. This study found that WeChat is one of the top ten social networking sites worldwide, and Tencent Qzone is the third largest with its monthly active user number reaching 712 million.

China's social media has not only become a place where citizens can express their dissatisfaction and discontent about environment and social issues and misbehavior of government and business, but has also become an effective tool for decentralized citizen actions. For example, mass demonstrations against PX chemical projects in several big cities in China, such as Dalian and Kunming, would not have happened given the political system in China if there was no social media through which people could gather and organize. In this sense, social media has played an empowering role in China. The power of environment "movements", which have now assumed new size, scale and characteristics, has resulted in concern among China's political leaders over the risk of social and political unrest[9]. This has pushed the government to publicly commit to anti-pollution and environment protection targets which are shared and appreciated by environmentalists and the general public. As the middle class grows and public concern over environmental problems intensifies, public pressure powered by the social media boom will play an increasingly important role in discussions about China's development model and environmental policies.

Externally, China's emergence as an economic powerhouse and large-scale polluter has created geopolitical tensions. China's role in many fields such as climate change, finance, infrastructure and development, and in regions outside of the mainland, are also growing rapidly, while a long-term vision for the country's political, social and economic footprint is yet to be fully formed.

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[7] China News Network, 2012. *McKinsey: China Has the Biggest Number of Social Media Users, Ranking the First in the World.* [online] Available at: http://tech.qq.com/a/20120426/000023.htm[date of visit: 2014].

[8] Sohu, 2013. *Where Is the Next Growth Point for Social Medias?* [online] Available at: http://biz.21cbh.com/2013/cypl_1125/955204.html[date of visit: 23 3 2014].

[9] He Li, 2013. *China Environmental Protection Activists Group.* [online] Available at: http://www.ftchinese.com/story/001052775 [date of visit: 23 3 2014].

There are now less than two years left until the climate change negotiation in Paris at the end of 2015 at which nations have committed to agree a new global treaty. China, as one of the decisive powers, along with the US, EU and other emerging economies, is expected to play more a constructive and active leadership role both domestically and internationally in forming this agreement.

2. Energy Saving and Renewable Energy: Development Needs to Speed up in the Latter Half of China's Twelfth Five-Year-Plan

China's total energy consumption in 2013 was equivalent to 3.75 billion tonnes of coal, up by 3.7% from the level of 2012. This increased rate is lower than both the figure estimated in the Twelfth Five-Year Plan and the 4% rate of the previous year, becoming the lowest increase since 2002. While coal consumption increased by 3.7%, consumption of crude oil rose by 3.4%, natural gas by 13.4%, and power consumption in general by 7.5%. The percentage of total energy consumption that was generated by non-fossil fuels grew from 9.1% in 2012 to 9.8% in 2013. The gradual decline in coal consumption indicates that China's energy mix is slowly being adjusted, which is a result of the structural adjustments of the energy industry itself as well as stronger air pollution controls[10]. Moreover, the energy consumption per GDP, or energy intensity, in 2013 decreased by 3.7%, compared to the decrease rate of 3.6% in the previous year.

Table 1 Total Energy Consumption and Energy Mix 2011-2013

Year	Total Energy Consumption (10,000 tonnes of coal equivalent)	Total Energy Consumption by Type (%)						Energy Consumption Decrease/ 10,000 *yuan* GDP (%)
		Coal	Oil	Natural Gas	Hydro, nuclear and other energy generation	In which		
						Hydro-power	Nuclear Power	
2011	348,002	68.4	18.6	5.0	8.0	6.4	0.8	2.01
2012	361,732	66.6	18.8	5.2	9.4	7.6	0.8	3.60
2013 estimated	375,000	65.7	18.9	5.5	9.8	-	-	3.70

Source: *China Energy Statistical Yearbook 2013*[11], *China Energy News 2014*[12], *National Economic and Social Development Statistics Bulletin 2011, 2012, 2013*

10 Wang Erde，2014. 21st Century Business Herald, *Non-Fossil Energy Percentage Up By 9.8% in 2013* [online] Available at: http://biz.21cbh.com/2014/1-13/3MMDA0MTdfMTA0MjQ3Mg.html [date of visit：4 2014]

[11] Energy Division, National Bureau of Statistics, *China Energy Statistical Yearbook 2013*. China Statistics Press. 2014

[12] China Energy News, 2014. *Energy Consumption Structure Will Be Further Optimized This Year* [online]

In 2013, the power consumption per unit of GDP was reduced by 0.19%, slightly less than the 2% decrease rate of the previous year. In 2013, total electricity consumption totaled 5322.3 billion kilowatts, reaching a year-on-year growth of 7.5%[13], up by 2% from 2012's growth rate[14]. In 2013, the national installed power generation capacity reached 1.25 billion kilowatts, ranking first in the world for the first time. In addition, industrial power use varied significantly between quarters, with the growth rate of the manufacturing sectors' power consumption increasing gradually quarter by quarter[15]. China's four high energy consumption industries are iron and steel, nonferrous metals, building materials, and the chemical industry, which account for over 30% of China's electricity consumption. The growth rate of power consumption in these industries dropped during the 2nd quarter and then increased in the following ones[16]. The increase rate of the total power consumption of China, however, dropped in the fourth quarter of 2013 by 2.5% to 8.4%, in comparison to the third quarter[17]. This is due to the slowdown in the growth of the industrial economy, the higher power consumption baseline during the same period last year, as well as the weather conditions. In addition, China is aiming to tackle serious over production capacity in the iron and steel, cement, electrolytic aluminum, flat glass and shipping industries.

The coal consumption rate for thermal power supply was 321 grams/kilowatt, a reduction of 4% (2012-2013)[18].The average cumulative working hours of power generation equipment saw a year-on-year decrease of 68% in 2013. Specifically, the average cumulative working hours of hydropower decreased by 273%, thermal power increased by 30% and wind power connected to grid increased by 151%.

The amount of unused wind power was reduced by around 5 billion kilowatts from the previous year, but wind power still faces serious restrictions in connecting to the state grid, and unused wind power in some areas still hinders the development of China's wind power industry. In response to this problem, the National Energy Administration issued a notice on April 14, requiring that areas with serious problems related to unused wind power do not allow further wind power construction

http://www.cnpc.com.cn/News/zzxw/xwzx/sycj/201401/20140129_C2017.shtml?COLLCC=1503088608& [date of visit：4 2014]

[13] National Energy Administration，2014. *The National Energy Administration published 2013 whole society power consumption statistics* [online] Available at: http://www.gov.cn/gzdt/2014-01/14/content_2566377.htm [date of visit：4 2014]

[14] Ibid 1

[15] China News,*China's Power Generation Capacity Ranked the First in the World for the First Time in 2013* [online] Available at: http://www.ccchina.gov.cn/Detail.aspx?newsId=43069&TId=57 [date of visit：4 2014]

[16] Ibid. 15

[17]Economic Daily, *Positive changes emerge in the investment in power sector* [online] available at: http://finance.sina.com.cn/roll/20140128/075018105865.shtml [date of visit: 4 2014]

[18] Ibid 13

until the problem is resolved[19]. At the same time, the problem of excess capacity in the international and domestic coal markets is becoming more and more serious[20]. In 2014, China plans to eliminate 117.48 million tonnes of outdated coal production capacity[21]. However, the power industry in general is still undergoing major structural adjustment and is in a kind of transitional period, which creates a great deal of uncertainties regarding ongoing efforts to optimize the industry. It will require greater political determination and stronger policies in order to push through the necessary transformation of the sector and China's energy systems.

Due to the serious smog that hit China in 2013, the Government issued the Action Plan for Air Pollution Prevention and Control. This plan promoted the development of provincial level action plans to set an absolute coal consumption cap or slow down the coal consumption growth rate, both of which can help achieve energy saving and emission reduction targets during the Twelfth Five-Year Plan period. The energy intensity in 2013 decreased by an enormous 9.25% from that of 2010, and is therefore on track to achieve the 16% energy saving goal prescribed by the Twelfth Five-Year Plan. While these policy developments are important, the achievement of the energy saving target in 2013 benefits mainly from the economic downturn. It has been observed in the past two or three years that China's performance in energy saving is closely related to the economic situation, indicating that the economic structure still needs further adjustment[22]. In the 2014-2015, achieving the energy saving targets of the Twelfth Five-Year Plan period will require that the average annual energy intensity decrease rate in 2014 and 2015 should be no less than 3.8%.

Achieving the targets of the Twelfth Five Year Plan will require stronger energy saving efforts than those implemented during the first three years of the Plan, and there is still a considerable degree of uncertainty as to whether or not China will achieve this goal. Two of the most significant factors that will impact on China's energy saving efforts are urbanization and industrial transfer. To date, China's rapid urbanization has put great stress on the country's resources and environment, and the transition of industry from east to west raises the risk of "carbon leakage" as emissions targets differ between these areas. How and at what pace these two trends develop will play a crucial role in defining China's energy and climate situation in the coming years. In addition, the increasing

[19] National Energy Administration: *Areas with Serious Abandoned Wind Power Rationing Not to Expand Construction Scale* [online] Available at: http://www.indaa.com.cn/xwzx/yw_hg/201404/t20140415_1500066.html [date of visit：4 2014]

[20] National Business Daily, *Eliminating while Expanding, This Year's Excess Coal Capacity Might Reach 500 Million Tons* [online] Available at: http://www.nbd.com.cn/articles/2013-05-20/742496.html [date of visit：4 2014]

[21] Economic Daily,*The Withdrawal of Hundreds of Millions Tons of Capacity Can Hardly Solve the Problem of Coal Overcapacity* [online] Available at: http://gb.cri.cn/45591/2014/04/14/7631s4502934.htm [date of visit：4 2014]

[22] Ibid 10

scale and speed of transferring from coal to gas is also likely to create another uncertain factor that influences China's total energy consumption and energy structure[23].

3. Top-level Design of the Climate Policy System Established

Since 2012, the publication of the Work Plan for Greenhouse Gas Emission Control during the 12th Five-Year Plan Period (hereinafter referred to as the "Plan"), the Draft National Plan for Addressing Climate Change (hereinafter referred to as the "Draft"), and the National Strategy for Adapting to Climate Change (hereinafter referred to as the "Strategy"), have established what is known as China's "top-level design" for addressing climate change.

Work Plan for Greenhouse Gas Emission Control During the 12th Five-Year Plan Period

Issued by the State Council in December 2012

The Plan creates a comprehensive arrangement for the overall requirements and major targets for controlling greenhouse gas emissions in the future five years (2011-2015). The overarching goal of the plan is to reduce national carbon emissions per unit of GDP by 17% by 2015 from the 2010 level.

In order to achieve this, the Plan proposes to utilize various measures to control greenhouse gas emissions by focusing on adjusting industry structure, promoting energy saving and consumption reduction measures, developing low-carbon energy sources, increasing forest carbon sinks, controlling greenhouse gas emissions from non-energy activities, and strengthening the saving and replacement of high-emission products.

The Plan also proposes adopting specific mitigation measures such as improving climate change policy systems and mechanisms, establishing greenhouse gas emissions accounting systems, creating a carbon emission trading market, carrying out low-carbon pilot projects, forming a group of low-carbon provinces, regions and municipalities with unique characteristics, establishing a group of low-carbon parks and communities, and popularizing a group of low-carbon technologies and products with sound emission reduction effects.

Finally, the Plan emphasizes that organizational leadership and evaluation and assessment should be strengthened. In order to realize this goal, the plan proposes breaking down and assigning

[23] Qi Ye, China Low-Carbon Development Report (2014) Social Sciences Academic Press. March 2014 p3.

mandatory targets for carbon emission reduction per unit of GDP which subnational governments will be accountable for[24].

The Plan is the first important guideline document[25] on controlling greenhouse gas emissions issued by the State Council and indicates that green and low-carbon development will be an important trend and characteristic of China's future. Since the publication of the Plan, the provinces have also responded to the target responsibility system and further assigned carbon intensity targets to the regions under their jurisdiction. Low-carbon pilot cities, emission trading system and the statistical and accounting system for greenhouse gas emissions mentioned in the Plan have also been further established. However, there are still challenges regards to the thoroughness and impact of implementation.

The scale of work regarding collection of statistics of emission sources and emission inventories is enormous. A basic statistical system of greenhouse gas emissions needs to be established and the accounting of greenhouse gas emissions also needs to be strengthened. Under the Plan, a state-local-enterprise three-tier system for the basic statistic gathering and accounting of greenhouse gas emissions is to be formed, and the system of direct reporting of energy and greenhouse gas emission statistics by key enterprises is to be implemented[26]. This means the statistical collection and accounting work includes a broad range of actors and will therefore be a complex. Therefore, efficiency and diligence is of great importance in order to ensure the accuracy of statistics that are gathered through these new systems – this is likely to be a considerable challenge.

In order to ensure a long-term and effective climate policy in China, it is important that both market mechanisms and the administrative system are fully utilized. Since 2013, seven regional carbon trading pilots have been initiated in China. According to some experts, Beijing, Shanghai, Tianjin and Shenzhen have relied mainly on the market, whereas Chongqing and Hubei rely mainly on the administrative mechanisms. Influenced by Shenzhen, the pilot project work in Guangdong is utilizing both market and administrative forces[27]. In the short term, the administration-oriented model can help emission reduction enterprises to accomplish the submission and verification of historical statistics, but in the long term, continuous trading and stable market signal to the emitting

[24]State Council, 2012. *Notice of the State Council on Issuing the Work Plan for Greenhouse Gas Emission Control during the 12th Five-Year Plan* [online] Available at: http://www.gov.cn/zwgk/2012-01/13/content_2043645.htm

[25]During the "Eleventh Five-Year Plan" period, energy saving and emission reduction are mainly represented in the control of energy intensity per Unit GDP, but in the emphasis on both special energy and carbon during the "Twelfth Five-Year Plan".

[26] Ibid 10

[27]China Finance, 2014. *Developing the Carbon Emission Right Trading Market.* [online] Available at: http://news.10jqka.com.cn/20140319/c564502865.shtml [date of visit: 4 2014].

industries and enterprises can be only achieved by creating a functioning carbon market to further pin down the key element in carbon trading—the price[28]. Therefore, from the perspective of establishing a stable carbon market in China, the correct balance and combination of the two models should be formed and the coordination and connection between different policies should be strengthened at both the design and implementation levels. Further analysis of carbon market development in China is provided in chapter 3.3.

Supervision and legislation work also need to be implemented and strengthened. Although the Plan proposes implementing accountability, compliance and reward mechanisms for climate mitigation activities, it does not set out specific standards and rules. In the implementation process, strong and just laws, regulation and specific and operable processes are required as the basis for ensuring compliance and enforcement. Furthermore, the related institutions, such as those responsible for the regulatory and verification systems, need to have clearly defined mandates.

It is critical that social forces are actively engaged in the process. Social forces include private enterprises, non-government organizations, think tanks, scientific institutions, academia, lawyers and the general public. Their participation should be extensive, in-depth and meaningful, including local implementation actions, publicity and advocacy, supervision of the implementation activities of the government and industries at different levels. The relevant stakeholders should also be able to engage in legal actions, for example, by building cases for the investigation of inaction or violations. Crucially, the policy discussion space must be opened up and all concerned stakeholders must be able to participate in policy making process.

The control of greenhouse gas emissions involves the interests of many parties, and to define the emission reduction programs that meet China's domestic situation therefore requires the input of different stakeholders. Active engagement can facilitate the improvement of social awareness of emission reduction, promote the transparency and effectiveness of policy formulation and implementation, balance the interests of different actors, and ultimately support the fair, effective, and sustainable transformation of China's economic, energy and social systems.

National Plan to Address Climate Change (2013-2020), Draft Version
Drafted by the National Development and Reform Commission (NDRC) in cooperation and coordination with ministries, including: the Ministry of Environmental Protection, the Ministry of Science and Technology, the Ministry of Housing and Urban-Rural Development and

[28]Carbon Trading Network, 2014. *China Utilizes the Carbon Market Mechanism and Might Achieve the 2020 Greenhouse Gas Emission Target.* [online] Available at: http://www.tanpaifang.com/tanguihua/2014/0320/30147.html [date of visit: 23 3 2014].

the Ministry of Finance, July 2013

According to publicly available information, the Draft primarily lays down the main objectives of addressing climate change over the coming seven years. This includes 6 main objectives:

- greenhouse gas emission control targets are achieved effectively;
- low-carbon pilot projects achieve significant effects;
- capability to adapt to climate change is significantly improved;
- basic capabilities are significantly strengthened;
- systems and mechanism are further improved; and
- extensive international cooperation is carried out.

The Draft points out that carbon emissions per unit of GDP is to be reduced by 40%-50% by 2020 from the 2005 level, the percentage of total energy consumption generated by non-fossil fuel energy is to increase to around 15%, and the forest area and stock volume are to be increased respectively by 40 million hectares and 1.3 billion cubic meters from the 2005 level[29].

China will focus on analyzing the trends in total carbon emission developments, as well as defining the possible total carbon control targets for step-by-step reductions. The overall aim is to take on an absolute emission reduction target gradually, as compared to the current intensity-based target. This will probably be used as an inspirational target during the Thirteenth Five-Year Plan period based on the gradual improvement of the total energy consumption control system.

Under the draft plan, China will study the overall framework of the national carbon trade system, and clearly define the strategic goals, work plans, implementation steps and supporting measures. It will also carry out system designs of the key elements of emission allowance allocation, measuring, reporting and verification (MRV), trading rules, incentive mechanisms and market management systems, and formulate management measures for national carbon emission trading activities[30].

The Draft has formulated the specific strategic arrangements with regards to climate change adaptation. It plans to implement adaptation pilot projects in six aspects: urban climate disaster prevention and recovery, integrated coastal zone management and disaster prevention,

[29]Wang Erde, Wei Wei, 2013. *The Top-Level Design of Addressing Climate Change Is Formed and Plans to Implement 6 Adaptation Pilot Projects.* [online] Available at: http://www.21cbh.com/2013/8-5/0ONDE3XzczNjk0OQ.html[date of visit: 1 3 2014]

[30] Ibid 29

comprehensive grassland degradation management, urban population health and adaption, forest ecosystem adaption, and wetland protection and recovery[31] .

The Draft has three important highlights: first, it clearly proposes formulating total carbon emission control in the future (an absolute cap rather than an intensity cap); second, it states that studies are to be carried out on the development of a national emission trading system; third, it formulates specific strategic arrangements for climate change adaption.

Although China has made a pledge to the world to reduce carbon intensity 40%-45% by 2020 from 2005 levels, as the world's biggest carbon emitter, China will inevitably face significant pressure from various parties to take decisive action on emissions. At the same time, the domestic need for environmental protection, health, energy and resource security, and social stability all require that the country adopts long-term and tough emission reduction commitments in the following decade and beyond. By clearly proposing the prospect of a total carbon emission control program in the near future, China shows the world and its citizens its determination to combat climate change and provide a clean and safe environment for the country. But as a developing country with a sizable and continuously growing economy, such a goal poses huge challenges, and China must specify the emission peak as soon as possible in order to spur the needed transformation. The later this peak occurs, the greater the total cost will be and the greater the potential resistance the transformation will face.

In the latter half of 2011, the National Development and Reform Commission established carbon trading pilot projects in seven provinces and municipalities. In 2013, the pilot regions started to implement their carbon trading activities. However, the different pilot regions have different system design merits with regards to the allowance allocation, MRV, trading rules, incentive mechanisms and regulatory systems, leading to considerable challenges in designing and establishing a national carbon trading system. In addition to the need to establish a firm legal basis and unified basic standards at the national level, questions still remain regarding how to set the total emission cap to ensure it is effective in reducing emissions, and how to ensure the functioning of the market mechanism and full participation and public monitoring of the carbon market.

The Draft raises the importance of climate change adaption work and sets specific objectives and working areas. As the Fifth Assessment Report (AR5) of the United Nations Intergovernmental Panel on Climate Change (IPCC) points out that against the background of climate change, extreme weather conditions and natural disasters are more likely to occur and with more destructive power,

[31] Ibid 29

causing great losses to society, the environment and the economy. Developing countries, especially the poorer ones, are more vulnerable to the threats of climate change[32]. Therefore, integrating adaptation into the related national development plans is of tremendous relevance and urgency. In this context, the term "adaptation" means to mitigate the negative impacts of climate change on the ecosystem and social and economic systems by improving and adjusting human activities and making full use of the potential benefits associated with climate change[33].

China's National Strategy for Adapting to Climate Change

Published by the National Development and Reform Commission published, November 2013

The Strategy summarizes the observed impacts of climate change on China, possible future trends, the present status and weak spots of climate change adaptation activities. It puts forward the overall requirements and three goals of China's adaptation work:

- national adaptation capability is to be significantly strengthened;
- key adaptation tasks are to be fully implemented; and
- regional patterns of adaptation work are to be formed[34].

Strengthening adaptation capacities means that the vulnerability of the climate sensitive and vulnerable locations, regions and groups will be significantly reduced. This will require that social and public awareness of climate change adaptation be improved; adaptation related scientific knowledge disseminated, and adaptation training and capacity building effectively implemented. In addition, basic research, observation, predication and impact evaluation abilities must be significantly improved, and the ability to monitor and develop early-warning systems for extreme weather events improved, as well as capacities to prevent and mitigate such events. Under the Strategy, finance for adaptation actions will also be effectively guaranteed and adaptation technology systems and technical standards established, demonstrated and promoted[35].

The full implementation of key adaptation tasks requires that the related infrastructure standards are revised or completed and that the ability to address extreme weather events is significantly strengthened. The Strategy also calls for related targets in agriculture and forestry sectors to be

[32]Greenovation Hub, 2013. *Climate Change Is Mainly Caused by Human Activities and Is Worsening.* [online] Available at: http://green.sohu.com/20130929/n387421401.shtml[date of visit: 9 3 2014].

[33]Chinanews.com, 2013. *China Issues the First National Strategy for Adapting to Climate Change*. [online] Available at: http://www.chinanews.com/gn/2013/11-19/5517108.shtml [date of visit: 9 3 2014].

[34]National Development and Reform Commission, 2013. *China's National Strategy for Adapting to Climate Change.* [online] Available at: http://www.mof.gov.cn/zhengwuxinxi/zhengcefabu/201312/P020131209533290709659.pdf [date of visit: 3 2014].

[35]Jiang Yan, Han Mei, Zhang Zhengfu, 2013. *Interpreting China's First National Strategy for Adapting to Climate Change.* [online] Available at: http://jjckb.xinhuanet.com/2013-11/19/content_477318.htm[date of visit: 9 3 2014].

achieved and the climate change adaptation ability in the industries greatly improved. Ecosystems such as forests, grasslands and wetlands are to be protected effectively, and land desertification and encroachment effectively controlled. The system of appropriate distribution and efficient utilization of water resources must also be established and the drinking water security of the urban and rural residents fully guaranteed. The strategy also states that ecosystems of the coastal area and related areas shall be well governed and maintained, and that health protection related knowledge and skills are popularized[36].

The Strategy points out, for the first time, that the different influences of climate change on the production and life activities of people in different regions need to be considered in a comprehensive way. This should be based on the regional pattern of the three adaptation sectors of urbanization, agricultural development and ecological security, each of which has different adaptation tasks with different focuses. This requires that local governments and their departments adjust and improve current policies and institutional arrangements in order to establish and improve adaptation related systems and mechanisms, funding sources, technology support and international cooperation systems that guarantee the adaptation actions.[37]

In November 2013, the Chinese government published China's National Strategy for Adapting to Climate Change at a High Level Seminar at the Warsaw Climate Change Conference. Xie Zhehua, Vice Chairman of the National Development and Reform Commission explained how, based on the full assessment of the present and future impacts of climate change on China, this Strategy specifies the guiding principles for national climate change adaptation work, puts forward adaptation goals, key tasks, regional patterns and supporting measures, and provides guidance for the coordination and implementation of adaptation work in China[38].

The publication of the Strategy addressed the absence of adaptation policies of China. Actions to address climate change include both mitigation and adaptation, but both with regards to domestic policy and international negotiations, there is a tendency of emphasizing mitigation while neglecting adaptation Climate change has a huge influence on society, the economy, and a wide range of activities related to people's livelihoods and well-being. Different areas have different levels of vulnerability and require different adaptation actions, but climate changes will deeply impact core areas such as agriculture, water resources, infrastructure and health. The Strategy puts forward

[36] Ibid 33

[37] Ibid 33

[38] [Han Mei, Gao Fan, 2013. China Issues China's National Strategy for Adapting to Climate Change. [online] Available at: http://news.xinhuanet.com/2013-11/18/c_125722514.htm[date of visit: 1 3 2014].]

concrete targets for China's climate change adaptation by 2020 and is of great significance to the improvement of the country's comprehensive ability to adapt to climate change[39].

The issue of adaptation is also a common challenge faced by the developing countries. At present, climate related South-South cooperation carried out by China mainly concerns donating energy saving products and providing finance and technology support to other developing countries. However, there is often a greater need to reduce the negative impacts already caused by climate change, and support is needed to develop appropriate adaptation actions and measures. Therefore, China needs to formulate an international strategy for climate change adaptation and promote South-South cooperation in this field.

In the special column under the key tasks of the Strategy, 14 adaptation pilot projects are listed, representing different adaptation works in various fields. They can serve as an example to other countries, and China needs to effectively implement these measures and share the experiences with others.

Generally speaking, China still has a long way to go in terms of climate change adaptation. Currently, the adaptation work is still dispersed in terms of institutional setting, organization and management and work content. Crucially, overall coordination is by and large still lacking. Challenges still exist regarding implementation by different departments at various regional and local levels, connecting with other related works and specifying the financial sources, technology support, and other complementary policies. Adaptation is a long-term task and needs effective guidance from scientific research and analyses. China needs to lay down a solid foundation for scientific research including national, inter-sectoral and inter-regional climate risks analysis and adaptation needs analysis, and also needs to establish systems to regularly update this scientific work. Adaptation has both proactive and reactive elements. In addition to reactive measures, such as disaster recovery, climate resilience should be established proactively. Furthermore, outstanding issues need to be addressed, such as how to connect adaptation with development and special planning in both urban and rural areas, including infrastructure (construction and transportation systems) and ecosystems (agriculture, forestry, and water resources).

4. Highlights and Criticisms of China's Major Energy and Climate Efforts

In 2013 there was continuing progress in energy saving, renewable energy development and climate change policies. But aside from these policy developments, there were also major changes

[39]Wu Yuzhen, 2013. Warsaw Negotiations: China Releases Positive Energy Within and Outside the Conference. *Wenhui Bao*, 24 11, p. 01.

in other areas. 2013 was the first year that the fight against air pollution jumped to the top of the political agenda. At the same time "coal control" gained significant political and social momentum, and discussion of the coal cap is no longer a politically sensitive subject. 2013 also saw the birth of the carbon market in China, and five out of seven regional emissions trading systems (ETS) pilots went live. 2013 was also a year of historical high growth for solar energy and investment in China. With all these achievements, China still faces numerous challenges in sustaining and accelerating the various climate actions and ensuring that they are efficient, effective and long-lasting.

4.1 Major Developments: Combating Air Pollution and Controlling Coal

Over 70% of China's energy comes from coal, which contributes to making China the biggest carbon dioxide emitter in the world. According to a report by Deutsche Bank[40], coal-burning contributes to 45 percent of China's PM2.5 pollution. Zhou Shengxian, minister of Ministry of Environmental Protection (MEP), said that the heavy reliance on coal is the dominant cause for the severe air pollution in China[41].

China's State Council released its Action Plan for Air Pollution Prevention and Control (here in after referred to as Action Plan) on 12 September 2013, eight months after the widely-reported air pollution episode that occurred in January 2013, which covered one-sixth of China's territory. The Action Plan sets the road map for air pollution prevention and control for the next five years in China with a focus on three key regions: the Beijing-Tianjin-Hebei area (Jing-Jin-Ji), the Yangtze River Delta (YRD) and Pearl River Delta (PRD). The release of the Action Plan was reported publicly on the website of China's central government and by the state-run Xinhua News Agency and CCTV, where it was described as a crucial step toward air pollution prevention and control in China. It is the country's most detailed and strict plan on this matter, demonstrating the political will to tackle the severe air pollution that has increasingly plagued China.

The goal of the Action Plan is to improve the air quality of the entire country by 2017, with stricter air pollution reduction measures in the three key industrial areas surrounding Beijing, Shanghai and Guangzhou (mentioned above). Specifically, the plan pledges to[42]:

- Control coal consumption by establishing medium- and long-term targets for coal consumption. This includes targets to:

[40] Deutsche Bank, 2013. *China:Big bang measures to fight air pollution.* [online] Available at: http://www.zadek.net/wp-content/uploads/2013/07/China-big-bang-measures-to-fight-air-pollution.pdf [date of visit: 2014].

[41] Zhang Kai, 2013. *Coal Reduction Is the Key to Combating the Smog.* [online]
Available at: http://m.greenpeace.org/china/zh/high/news/commentaries/blog/47810/#_ftn4 [date of visit: 2014].

[42] Finamore, B., 2013. *China Pledges to Tackle Air Pollution with New Plan.* [on line]
Available at: http://switchboard.nrdc.org/blogs/bfinamore/china_pledges_to_tackle_air_po.html

  - Prohibit the approval of new coal-fired power plants in the three key industrial areas (except for combined heat and power plants), while requiring existing coal consuming projects to implement coal reduction and substitution projects.
  - Cut the percentage of total energy generated by using coal to below 65 percent by 2017 (down from 66.8 percent in 2012);
  - Achieve negative coal use growth rate in the three key polluted areas by replacing coal with electricity generated from natural gas and non-fossil fuel energy.

- Cut iron-making and steel-making capacity by 15 million tons in 2015.
- Control the number of automobiles on the roads.
- Increase non-fossil fuel (such as wind and solar) from 9.1% in 2012 to 13% by 2017 and increase shale-gas production.

While the comprehensive action plan is a major step in the right direction[43], some critics believe that the plan fell short of expectations, for example, it did not provide quantified coal caps in key areas. Dr. Yang Fuqiang, senior adviser of the NGO Natural Resources Defense Council, said municipalities such as Beijing and Tianjin should have aimed higher and cut PM2.5 by 25 percent, as they have more resources and are better positioned to do so[44].

Collectively, China is about to invest 174 billion RMB in implementing the Action Plan, of which the investment in industry pollution control takes up 36.7%. Driven by this investment, GDP is expected to increase by 2,500 billion RMB. It is estimated that the industries related to environmental protection and air pollution control will see an added value of 1,600 billion RMB by 2017 providing new jobs for 3.7 million people[45].

In response to the Action Plan, provincial authorities have set targets to tackle air pollution and curb coal consumption:

- Beijing has pledged to cut coal consumption by 50% (13 million tonnes) by 2017 compared to 2012 levels; Hebei by 13% (40 million tonnes); Tianjin by 19% (10 million tonnes); and Shandong province by 5% (20 million tonnes)[46]. Shaanxi province pledged to set a coal

[43]Jing, L., 2013. *China unveils tough measures to combat air pollution.* [online]
Available at: http://www.scmp.com/news/china/article/1308794/china-unveils-tough-measures-combat-air-pollution [date of visit: 2014].

[44]Ibid 41

[45] Xinmin.cn, *Commentary: Who Says Air Pollution Control Is a Losing Business?* Available at: http://finance.ifeng.com/a/20140408/12072950_0.shtml

[46]Ministry of Environmental Protection, etc. 2013. *Implementing Rules for the Implementation of the Air Pollution Prevention and Control Action Plan of Beijing-Tianjin-Hebei and the Surrounding Areas.* [online] Available at: http://www.mep.gov.cn/gkml/hbb/bwj/201309/W020130918412886411956.pdf[date of visit: 3 2014].

consumption cap of 138 million tonnes by 2017 and Chongqing 58 million tonnes (21% reduction compared to 2012 levels)[47].

- At present, the Yangtze River Delta (YRD) including Shanghai, Jiangsu province and Zhejiang province, accounts for 11% of national coal consumption. Along with the Pearl River Delta (PRD), the YRD has pledged to achieve negative coal consumption rate by 2017. Guangdong province pledged to reduce the proportion of coal used in the total provincial energy mix to below 36% by 2017, Jiangxi, Jilin and Hunan province below 65%, and Hubei province below 60%[48].
- Heilongjiang, Anhui, and Fujian provinces pledged to control coal consumption, but have not yet announced any specific targets.

These coal control measures mean a reduction in coal consumption of approximately 350 million tonnes (MT) by 2017 and 655 million MT by 2020, compared with business-as-usual growth. This translates into an estimated reduction in CO2 emissions of about 700 MT in 2017 and 1,300 MT in 2020. Further reductions in coal consumption covering most of China's coal use can be expected if more provinces put forward their coal control plans. Implementing the existing coal control plans would significantly slow down China's CO2 emission growth, and could bring China's projected CO2 emissions almost in line with a 2 degrees trajectory. China's coal consumption has already slowed down recently with a number of key provinces seeing absolute consumption decreases in 2012, paving the way for broader national moves in this direction[49].

4.1.1 Challenges and Loopholes

Despite the political will demonstrated in the action plans by central and provincial governments, uncertainties and huge challenges (including potential loopholes) still exist that might affect the effectiveness of these action plans and leave their pledges unfulfilled.

The main challenge lies in the enforcement and implementation of the action plans. In the past 30 years, coal has been the major engine for China's rapid economic growth. Although the eastern part of China—the most prosperous—is undergoing an economic transition, cutting coal use and controlling energy consumption will inevitably affect the economic growth rate. This is not a desirable choice for local governments, especially for those in the mid-western part of China which

[47] Greenpeace, 2014. *The End of China's Coal Boom- 6 Facts You Should Now.* [online] Available at: http://www.greenpeace.org/international/Global/international/briefings/climate/2014/The-End-of-Chinas-Coal-Boom.pdf [date of visit：4 2014]

[48] Wang Xiuqiang, 2014. *Exchange GDP for Air Quality.* [online] Available at: http://epaper.21cbh.com/html/2014-02/24/content_91188.htm?div=-1 [date of visit: 3 2014].

[49] Greenpeace, 2014. *The End of China's Coal Boom: 6 Facts You Should Know* Available at: http://www.greenpeace.org/international/Global/international/briefings/climate/2014/The-End-of-Chinas-Coal-Boom.pdf

are looking forward to achieving rapid economic development by extracting and burning their coal reserves. Additionally, the action plans announced by provincial governments do not usually have specific actionable tasks for relevant actors and stakeholders to implement, nor do they have a systematic monitoring, reporting and verification (MRV) scheme to monitor the process. This will very likely undermine the effectiveness of the national action plan.

Efforts to control air-pollution and coal consumption are further complicated by the on-going power struggles among government departments and between different levels, which will in turn have a huge impact on whether the political will and promises will be delivered or not[50]. Therefore, local governments' preoccupation with GDP growth rate, lack of specific actionable tasks and MRV, as well as the interaction among different ministries, will potentially create major pushbacks against the enforcement and implementation of the energy consumption controls.

In addition to the main challenge in enforcement and implementation, it is important not to overlook three major loopholes in the air pollution control plan.

First of all, the large-scale (da xing hua) and group development (ji tuan hua) of the coal industry as indicated in the 12th Five-Year-Plan of Coal Industry[51] aims to establish ten giant coal companies with a coal production capacity of 1 billion tonnes per year and ten coal companies with a coal production capacity of 50 million tonnes per year[52]. Although creating these coal giants could improve the coal production efficiency of the whole industry, the lobbying power of these giants in the political sphere could also increase to a new level. Also, it should be kept in mind that 60-80% of the world's fossil fuel reserves[53] need to remain underground if the world is to have a chance of keeping global temperature rise below 2 degrees. China, a "chain smog smoker", needs to stop its addiction to coal as soon as possible and turn to renewable energies for a sustainable future for China and the world.

Secondly, there are also serious concerns about the transfer of heavy industry and power-plants to the mid-western part of China. This raises concerns regarding the so called "carbon leakage" issue, whereby high emitting industry is moved from areas of strict emissions regulation to areas with more relaxed regulations. It is inevitable that this will worsen the already serious air pollution in

[50]Reuters, 2014. *Modification—China is Planning Organizational Reconstructing and the Ministry of Environmental Protection Might Have More Power.* [online] Available at: http://cn.reuters.com/article/healthDrugsNews/idCNL3S0LG1W520140212[date of visit: 2014].

[51]The National Development and Reform Commission, 2013. *The "Twelfth Five-Year Plan for the Development of the Coal Industry".* [online] Available at:http://zfxxgk.ndrc.gov.cn/Attachment/%E4%B8%80%E3%80%81%E3%80%8A%E7%85%A4%E7%82%AD%E5%B7%A5%E4%B8%9A%E5%8F%91%E5%B1%95%E2%80%9C%E5%8D%81%E4%BA%8C%E4%BA%94%E2%80%9D%E8%A7%84%E5%88%92%E3%80%8B.pdf[date of visit: 2014].

[52] Energy Channel—people.com, 2012. *Wu Yin: The Coal Production Capacity Will Reach 4 Billion Tonnes and Form 1 billion 100-Million-Tonne Coal Enterprises in 2015.* [online] Available at: http://energy.people.com.cn/GB/17460513.html[date of visit: 2014].

[53]Carbontracker, 2013. *Unburnable carbon 2013: Wasted capital and stranded assets.* [online] Available at: http://www.carbontracker.org/wastedcapital[访问日期: 2014].

the mid-west, causing further damage to public health. Besides this, the increased demand for water caused by the transfer of heavy industry and power plants will worsen the problem of water scarcity of the mid-west, which could prove to be a fatal blow to this ecologically vulnerable region[54].

Thirdly, the so-called "clean solutions", such as Carbon Dioxide Capture and Storage (CCS), "Clean Coal", Coal-to-gas/synthetic natural gas and unconventional natural gas, etc. may create a dangerous trend in the name of controlling air pollution and reducing carbon emissions. Take coal-to-gas synthetic natural gas (SNG) for example, the highly water-intensive process of producing coal-to-gas SNG will no doubt damage the ecological systems of the region[55]. Moreover, according to a report by Duke University, the life cycle of coal-to-gas SNG (normally 40 years) will emit 36 percent – 108 percent more carbon dioxide than burning coal. China plans to approve the construction of nine factories which will produce over 37 billion m^3 of coal-to-gas SNG. Given that the normal life cycle of the factories is 40 years, once constructed, the nine coal-to-gas SNG factories will emit 21 billion tonnes of carbon dioxide, which is 7 times the emission of a traditional natural gas factory, and exceeds the total emission reduction achieved by wind and solar power in China.

Last but not least, while the link between air pollution and burning coal is recognized, we need to connect the dots. For many, the nexus of water and energy has, alarmingly, been overlooked and demands immediate action. China is a water-strained country, and the distribution of water resources and energy complexes is mismatched. With the rapid economic growth, energy demand will keep increasing, which will in turn drain the already limited water resources in the mid-west, and the dire water scarcity in this region will in turn become a choke-point in energy development. China needs to tackle the water-energy choke-point as soon as possible if it aims to pursue a path of sustainable development rather than one in which the country suffers a deteriorating environment, shrinking and increasingly polluted water resources, and increasing vulnerability to the risks posed by climate change[56].

4.1.2 Market-oriented Reforms and Macro Control of the Coal Industry

Besides the impact of these air-pollution control measures, the coal industry is subject to continuous reform as well as macro controls of the government.

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[54]Ibid 33

[55] Shiao, W. H. W. T. L., 2013. *China's Response to Air Pollution Poses Threat to Water*. [on line]
Available at: http://www.wri.org/blog/china%E2%80%99s-response-air-pollution-poses-threat-water[date of visit: 3 2014].

[56]Greenovation Hub, 2013. *Water Resources—Energy Bottlenecks.* [online] Available at: http://www.ghub.org/?p=1315 [date of visit: 3 2014].

The coal industry market was further upgraded in 2013 after the issue of the Guiding Opinions of the General Office of the State Council on Deepening Market-oriented Reforms for Thermal Coal which canceled the forced annual coal-supply contracts between power company and coal providers[57] and the associated dual-track pricing scheme for thermal coal[58], hence coal pricing is now fully determined by market[59].

During the last year, the Law of the People's Republic of China on the Coal Industry and Regulatory Measures for Coal Operation were also modified. The modified Law on the Coal Industry came into effect on June 29, 2013 and canceled administrative approval items such as coal production license issuance and approval of coal operation enterprises[60]. On December 6, 2013, the National Development and Reform Commission issued Regulatory Measures for Coal Operation (Amendment) and sought public comments. The Amendment points out that coal operation should abolish unreasonable intermediate processes, advocate conditional direct selling by coal mining enterprises and encourage large coal mining enterprises to sign middle- and long-term direct selling contracts with enterprises with high rates of coal consumption[61].

Second, the coal futures market has developed. On March 22, coking coal futures agreements trading kicked off at Dalian Commodity Exchange. On September 26, steam coal futures agreements started trading on Zhengzhou Commodity Exchange. The successive listing of coking coal and steam coal futures means that the coal spot market has begun to develop in synergy with the futures market and the marketization of the coal industry has been further realized.

The coal industry is becoming increasingly market oriented. However, as coal is an important source of energy (accounting for nearly 70% of total energy consumption), the government still maintains regulation and control of the coal industry at the national level. In May 2013, the Measures of Commercial Coal Quality Management (Draft) was announced including contents that concern the regulation of commercial coal quality management and circulation flow, the improvement of commercial coal quality and the promotion of the clean use of coal. The document was not officially published, however, due to the fierce pushback from the coal consuming companies and traders. In August, the General Administration of Customs issued an announcement to cancel the interim zero import tax rate of brown coal and recover the implementation of the 3%

[57] NDRC has led such annual contracting process where the coal industry are forced to ensure certain amount of coal supply to the major power companies.

[58] Contracted price and market price.

[59] Song Ying, *"Comments on the Notice of the Guiding Opinions of the General Office of the State Council on Deepening Market-oriented Reforms for Thermal Coal,"* 27 12 2012. [online]. Available: http://stock.stockstar.com/JC2012122700003210.shtml. [date of visit: 11 03 2014].

[60] Xinhua News Agency, *" The Order of the President of the People's Republic of China," 29 06 2013*. [online]. Available: http://www.gov.cn/flfg/2013-06/30/content_2437158.htm. [date of visit: 11 03 2014].

[61] China Mining Industry Newspaper, *"The National Development and Reform Commission Seeks Public Opinions on the Amendment on Regulatory Measures for Coal Operation," 10 12 2013.* [online]. Available: http://news.mlr.gov.cn/xwdt/jrxw/201312/t20131210_1295598.htm. [date of visit: 11 03 2014].

MFN (Most Favored Nation) tariff. In November, the General Office of the State Council issued the Opinions on Promoting the Smooth and Steady Operation of the Coal Industry, which highlighted five approaches to fully promote the smooth and steady operation of the coal industry, namely, curbing the runaway increase of coal production, rigorously reducing the burden of taxes and fees of coal enterprises, strengthening the management of coal imports and exports, improving the production and operation level of coal enterprises, and creating an environment for the sound development of coal enterprises[62].

The development of the coal industry in China and discussion around its cap and peak will not be a straightforward process. There will surely be turbulence ahead as the sector involves deep rooted and extensive interest groups, both at the central and local levels. However, the current momentum should be grasped, and with a forward looking mindset, great political leadership and wisdom, China will hopefully move forward and shift its energy system to a model that is safer, cleaner and healthier.

4.2 Renewable Energy Booming

Under China's 12th Five-Year Plan for Energy Development, the percentage of non-fossil fuel energy consumption in China's total energy mix is to increase by 11.4% and installed non-fossil energy power generation capacity will reach 30% of total capacity by 2015. To achieve this goal, the absolute hydropower, nuclear power and wind power capacities will be greatly increased[63]. In 2013, China's national power generation capacity ranked top in the world for the first time, and renewable power generation continues to grow rapidly. At the end of 2013, the installed national power generation capacity surpassed the United States for the first time and reached 1.25 billion kilowatts, in which the non-fossil energy reached 0.39 billion kilowatts, accounting for 32% of the total installed power generation capacity (an increase of 2.4% from 2012)[64]. During 2013:

- Coal power generation capacity reached 862.38 million kilowatts (increase of 5.7%);
- hydropower generation capacity reached 280.02 million kilowatts (increase of 12.3%);
- nuclear power generation capacity reached 14.61 million kilowatts (increase of 16.2%);
- connected-to-grid wind power generation capacity reached 75.48 million kilowatts (increase of 24.5%);

[62]Futures Daily, "*China Plans to Further Control the Quality of Imported Coal Products Strictly," 05 01 2014.* [online]. Available: http://finance.sina.com.cn/money/future/fmnews/20140105/225917848046.shtml. [date of visit: 11 03 2014].
[63]Great Wall Network, 2013. *China's Power Generation Equipment Carries On a Status of Adjustment in 2013.* [online] Available at: http://power.hebei.com.cn/system/2013/04/18/012715265.shtml[date of visit: 9 3 2014].

[64]Yan Xiaohong, 2014. *China's Power Generation Capacity Ranked First for the First Time in 2013*. [online] Available at: http://news.xinhuanet.com/yzyd/energy/20140225/c_119497673.htm [date of visit: 1 3 2014].

- connected-to-grid solar power generation capacity reached 14.79 million kilowatts (increase of 3.4 times[65].

4.2.1 China's Solar Photovoltaic Industry Developed Rapidly in 2013

The photovoltaic (PV) market experienced enormous development in 2013 as for the first time Asia surpassed Europe to become the biggest photovoltaic market in the world. In comparison to other renewable energies, China continues to enhance efforts in developing solar photovoltaic energy. In 2013, China published 16 policies and measures related to the photovoltaic market (see Appendix 1). The Several Opinions of the State Council on Promoting the Healthy Development of the Photovoltaic Industry, issued by the State Council on July 15, specified the policy direction of the photovoltaic industry development. The State Council required the ministries put forward detailed rules and regulations of the related policies within the prescribed time. Later on, the National Energy Administration, the Ministry of Finance, the Ministry of Industry and Information Technology, the National Grid and China Development Bank all issued different plans and detailed rules and put forward solutions to the different kinds of previous choke-points that existed in the development of the photovoltaic industry. At the present stage, the foundation of the domestic photovoltaic industry has been formed and the industry is awaiting the initiation of the photovoltaic application market[66].

4.2.2 Subsidized Prices and the Distributed Photovoltaic Power Generation Industry

China gives considerable support to the renewable energy industry, especially to the distributed photovoltaic power generation industry. In August 2013, the National Energy Administration issued a notice and approved 18 distributed photovoltaic power generation application demonstration zones including Zhongguancun Haidian Park in Haidian District, Beijing and Shunyi District, Beijing[67]. The Notice states that the purpose of establishing demonstration zones is to expand the distributed photovoltaic power generation application, and explore technologies, management and operation models that are suitable for the large-scale application of distributed photovoltaic power generation. At the same time, the distributed photovoltaic power generation projects in the demonstration zones will adopt the operation model of "self-generation for self-use, connecting the rest to the grid and

[65]National Bureau of Statistics of People's Republic of China, 2013. *2013 National Economic and Social Development Statistics Bulletin of the People's Republic of China,* Beijing: National Bureau of Statistics of People's Republic of China.

[66]China New Energy Network, 2014. *Review of Important Photovoltaic Power Events in 2013*. [online] Availableat:http://www.gtja.com/f10.do?method=xwzxDetail&type=hydt&guid={C79ED383-09A1-4CF3-9471 E9BCCB4AEB84}[date of visit: 14 2014].

[67] The 18 demonstration areas include Zhongguancun Haidian Science Park of Haidian District in Beijing, Shunyi of Beijing, Songjiang of Shanghai, Wuqing of Tianjin, Gaobeidian of Hebei, Baoding Yingli of Hebei, Wuxi of Jiangsu, Nantong of Jiangsu, Shaoxing of Zhejiang, Hangzhou of Zhejiang, Hefei of Anhui, Jiangxi Xinyu High-Tech Zone, Shandong Tai'an High-Tech Zone, Shandong Zibo High-Tech Zone, Guangdong Sanshui Industrial Park, Guangdong Conghua Pearl Industrial Park, Qianhai of Shenzhen, Hangzhou Bay New Zone of Ningbo.

grid adjustment". The subsidy policy will be implemented based on the amount of power generated[68]. In August, 2013, the National Development and Reform Commission issued a document and put forward 0.42 yuan/kWh subsidy for distributed photovoltaic power. The amount and form of subsidy is different for different provinces, autonomous regions and municipalities. The subsidy standard is generally a subsidy from the state plus a subsidy of 0.23-0.3 yuan/kWh. However, in Jiaxing, Zhejiang province, subsidies will only be offered for 3 years, declining by 0.5 *fen* each year (one fen is 0.01 yuan). So during this period, the subsidy standard is as high as 2.8 yuan/kWh. Subsidies are implemented differently depending on the province, autonomous regions or municipality where the plant is located. Some organize the subsidies to solar power plants with higher rates over a shorter time frame and some according to the size and function (such as commercial use or household use) of the power plants. Therefore, subsidy standards for power plants at different times and of different types are not all the same. See Appendix 2 for more detailed information.

At the same time, in order to promote the development of the photovoltaic industry, China raised the additional charge on power use, except for residential and agriculture production, from 0.008 yuan/kWh to 0.015 yuan/kWh to subsidize renewable energy. It also raised the subsidy standard for coal power plants' de-nitration from 0.008 yuan/kWh to 0.01 yuan/kWh and subsidized coal power plants with smoke dust emission density lower than 0.03 g/m^3 (less than 0.02 g/m^3 in key regions) by 0.002 yuan/kWh.

In general, China's electricity price adjustments have established a relatively complete and environmental-friendly electricity pricing system, driven the continuing decrease of polluting emissions of the power sector, promoted the development of the renewable energy, and played a very positive role in improving air quality in China.

4.2.3 Prospects and Challenges for the Photovoltaic Industry

At the beginning of 2014, based on the comprehensive consideration of factors such as resource endowments, level of development, grid consumption abilities and supporting policies and measures of different regions in China, the National Energy Administration set a record goal for annual increase of solar power by 14 million kilowatts in 2014 which consists of 8 million kilowatts of distributed solar power and 6 million kilowatts of photovoltaic power plants.[69] According to the present situation, the state's policies will still safeguard the photovoltaic industry, the demand for

[68]National Energy Administration, 2012. *The Notice of the National Energy Administration on Application of Large-scale Usage Demonstration Area of Distributed Solar PV Power Generation* . [online] Available at: http://www.gov.cn/zwgk/2012-09/28/content_2235051.htm[date of visit: 1 3 2014].

[69]National Energy Administration, 2014. *Notice on Increasing the Construction Scale of Solar PV Power Generation in 2014.* [online] Available at: http://finance.eastmoney.com/news/1355,20140212359440755.html[date of visit: 9 3 2014].

the photovoltaic market will continue to grow, and photovoltaic power can expect another successful year.

If the producers of China's photovoltaic products wish to continue to occupy a place in the international market, preparations need to be made to face many complex problems. In June 2013, the European Union proposed imposing punitive tariffs on China's photovoltaic products, an episode which is still fresh in China's memory. In 2014, trade barriers are still a great challenge to the exports of China's photovoltaic industry. The western countries carry out anti-dumping and anti-subsidy duty investigations on China's photovoltaic products from time to time. Such trade protectionism is not wise, and rather than engaging in trade wars, China and Europe must find ways to jointly promote the solar industry[70]. Readers are recommended to refer to the more detailed paper published by G:HUB in 2013 "Climate Protection Requires an Orderly and Prosperous Global PV Market".

EU-China photovoltaic trade frictions epitomize the deepening and extensive connection of trade and climate governance. This series of problems requires rational responses and resolution through comprehensive methods at a systematic level[71]. The EU and China need to carry out active dialogue and enhance their communication and cooperation at the governmental and enterprise levels as well as the civil society level. Within the framework of the EU-China high-level dialogues on energy or on trade, a joint working group on renewable energy and trade is needed to discuss the establishment of negotiation and resolution mechanisms related to WTO disputes and reach agreements on the related issues. In the process, it should be ensured that the stakeholders of the two parties fully participate in the discussions to reach a win-win solution[72].

Another issue that needs to be addressed is that of quality. China's photovoltaic industry is continuously expanding, but the quality of the components and power plants is not consistently high. It is an important challenge in 2014 for China's PV industry to develop rapidly, but do so on a solid foundation. It is necessary to improve quality, technology and investment in scientific research and to enhance the knowledge of core technologies across the entire industry chain (especially in the equipment manufacturing and application fields).

Finally, in 2013 the development of the photovoltaic industry has relied heavily on government policies and subsidies, which does not accord with the rules of free market development and is

[70]Greenovation Hub, 2013. *Objections to the Tariff of the EU on Chinese PV products.* [online] Available at: http://www.ghub.org/?p=1396 [date of visit: 3 2014].

[71]Policy Research Department, Greenovation Hub, *2012. Climate Protection Requires an Orderly and Prosperous Global PV Market.* [online] Available at :http://www.ghub.org/?p=1405 [date of visit: 17 3 2014].

[72] Ibid 69

likely to cause enterprises to rush into the market and lead to problems such as price competition, duplication and excess capacity. In the following years, the photovoltaic industry should gradually increase market demand, break away from the reliance on subsidies, achieve self-sustained and virtuous development and create a sustainable and healthy industry.

4.3 Carbon Tax and the Development of the Carbon Market

The Twelfth Five-Year Plan period is a key period for China's low-carbon policies to transition from relying on administrative orders to adopting market-based approaches. Drawing from international experiences, market-based policies mainly include two kinds: carbon tax and carbon emissions trading (ETS)[73].

In 2013, the notion of imposing a carbon tax triggered heated discussions among the public as well as several rounds of policy discussions and calls from some sections within the government to move forward with such a tax. In May, the Ministry of Environmental Protection submitted the Law of the People's Republic of China on Environmental Protection Tax (Draft), which integrated carbon tax into the environmental tax system. In early July, Lou Jiwei, Minister of Finance, indicated that the government would start collecting carbon tax "at a proper time". At the end of July, media reported that the National People's Congress was discussing carbon tax collection plans and the tax rate would exceed 10 yuan/ton[74].

The motivation for collecting carbon tax is based on the following factors: it helps reduce energy consumption, promotes energy saving and emission reduction, helps China establish a good international image, and accords with the trends of global climate action. But at the same time, imposing carbon tax will result in negative impacts on industries with high energy consumption and high emissions such as the steel, power and coal industries and even down-stream power users, including private citizens. Policy-makers have not yet reached an agreement in terms of their opinions on the carbon tax, which is a key reason why a carbon tax policy still has not been published. Furthermore, the dispute over carbon tax involves struggles between major government departments: the Ministry of Finance and the Ministry of Environmental Protection are in favor of *carbon tax* on the one hand and the National Development and Reform Commission and the Ministry of Industry and Information Technology prefer a *carbon trade* approach.

[73] Li Fengtao, 2013. *Experts of the Ministry of Finance: The Decision Makers Haven't Reached a Consensus on Carbon Tax.* [online] Available at: http://finance.people.com.cn/n/2013/0917/c1004-22941042.html[date of visit: 17 3 2014].

[74] bid 68

While carbon tax is still at the stage of policy discussion, carbon trade pilots are active after nearly three years of preparation, and 2013 is the first year of carbon trading under these pilots. The local carbon trade pilots have successively finished quota allocation, designed related mechanisms, built trade platforms, and commenced trading. By the end of 2013, among the seven pilot projects within China, Shenzhen, Beijing, Shanghai, Guangdong and Tianjin have started carbon emission trading, and the two other pilot projects are expected to start trading in 2014. At the same time, the design of the carbon trading system at the national level, including register and MRV, are proceeding steadily with support from the World Bank, the EU and the Australian government. On October 15, 2013, the General Office of the National Development and Reform Commission published the greenhouse gas emissions calculation methods and report guidance for enterprises. This will be trialed in an initial batch of 10 industries which will create a reference point for activities including carbon emission trading, the establishment of enterprise greenhouse gas emissions reporting systems, and improvement of emissions statistics collection and calculation systems[75].

The carbon offset project is also an important component of China's carbon market. The National Development and Reform Commission published the Interim Measures for the Administration of Voluntary Greenhouse Gas Emission Reduction Transactions, providing the registration, development and management rules for voluntary carbon offset projects in China. By March 20, 2014, the third batch of China's voluntary greenhouse gas emission reduction methodologies were published, registering 177 methodologies. The number of approved projects published on the China Voluntary Emission Reduction Transactions Platform reached 85, among which there were 46 CDM (Clean Development Mechanism) projects and 39 new projects[76].

4.3.1 Challenges and Loopholes

In 2013, China's carbon pilot projects were still in the initial stages of development and faced many challenges. Information transparency and the participation of stakeholders are thus of great importance. In reality, the information disclosure and accuracy of statistics of China's carbon market pilots are still seriously insufficient and there is no clear social monitoring or feedback channels. This paper identifies three main challenges the carbon market is current facing and which have relevance to the market's future development:

First of all, emissions cap setting lacks stringency and there is in most cases no real absolute cap, with the system relying instead on the grandfathering approach in which the allocation of allowance

[75]Greenovation Hub, 2013. *Non-Governmental Observations of the China Carbon Market in 2013,* Beijing Municipality: Greenovation Hub.

[76]Shanghai Treasure Carbon New Energy Environmental Protection Technology Co. Ltd., 2014, *Chinese Certified Emission Reduction (CCER) Progress and Market Analysis.* [online] Available at: http://www.atholdings.com/info.asp?id=586[date of visit: 17 3 2014].

is based on the historical emissions in recent year(s) and bottom-up calculation on such historical emissions. Cap setting of most pilots are mainly based on carbon intensity targets and the estimation of GDP growth rates. However, there is high uncertainty attached to the GDP growth rate, and this exists not only at aggregate level, i.e. the whole economy of the province/municipality concerned, but also the particular sectors or enterprises concerned. Moreover, the statistics that cap setting is based on are also innately deficient. The pilots generally take the approach of bottom-up reporting of historical statics in combination with verification by an assigned third-party. Considering that a large number of industries and enterprises are involved in the carbon pilots, that time pressure is high, and that there is strong tendency to report higher historical emissions in order to gain more free allowances, the quality of the data is hard to guarantee. All in all, emission caps under the carbon market need to be set stringently and should be at least lower than the business-as-usual (BAU) level. The reserved allowances for economic growth should be set against a reasonable matrix and considerations to avoid over-allocation. Moreover, special attention needs to be paid to the interaction with other policy targets, and the change of the energy and economic structures.

Second, management mechanisms and market risk control are insufficient. In particular, the power industry faces structural challenges, as electricity prices are controlled by the government and hence the downstream pass-on costs that would occur in a market-based power system are hard to foresee in China. The practice of integrating the upstream (power sector) and downstream (industries who use electricity) and assigning obligations to both the electricity produced and used still needs to be tested. Additionally, the legal basis of compliance and costs for not meeting the carbon cap is quite weak. The local governments except Shenzhen lack legislative power of the carbon market, and there are no national level laws to support. The pilots share common weakness regarding enforcement mechanisms, using low value and "one off" fines to punish violations. Monitoring, Reporting and Verification (MRV) systems and capacities are still at the initial and limited stages, and there is no specificity on how to ensure the independence and accuracy of work conducted by third party verifiers.

Therefore, in order to ensure the proper functioning of the carbon market, the design of management systems needs to be improved. Activities that violate the market rules and disturb the market order require severe punishment and effective enforcement mechanisms. A solid legal foundation should be provided through proper legislative processes at the national level. Fines should have a clear quantitative correlation with the gap of compliance and no buffer period should be given. MRV systems and methodologies need to be further advanced, for example, to cover sub-sectors and products. In order to ensure the independence and accuracy of third-party verification

institutions, strict qualification and accountability system should be put in place.

Another major concern is the low level of information transparency. Information disclosure and transparency is essential for the accountability and functioning of the carbon market. Pilots have shown various issues such as untimely disclosure and publication of information, the content of which is often limited, and insufficient transparency and accessibility of the register and trade system. Information and statistics that are important to market players should be provided to all actors at the same time so as to form a fair and transparent market environment. The information disclosure channels should be more streamlined and effective so the public can obtain information easily.

Different stakeholders should be actively engaged in the development of the carbon market. The fundamental objective of the carbon market is to achieve GHG reduction in a cost-effective manner. This should guide its development and requires all concerned parties to participate in policy development, rather than discussions and proposals being made by a small circle, or, as some may see it a "black box".

4.4. The Critical Role of Fiscal Support and Sustainable Financing

4.4.1 Strengthen Financial Leverage, Solve Climate and Environmental Problems

Among the series of climate and energy-related policies issued by the Chinese government in 2013, the importance of fiscal support and financing was mentioned many times. The use of financial leverage to solve environmental problems is integrated throughout the national low-carbon policies. These policies are discussed in more detail below, although it is worth mentioning that these policies are all limited to vague and general descriptions, and implementation still requires specific policies and tools, and the capacities and will to implement also require improvement.

The Opinions of the State Council on Promoting the Healthy Development of the Photovoltaic Industry[77] issued in July states that the strengthening of finance and tax policies should be used as the channel to improve the mechanism of the central government's fiscal support for the development of the photovoltaic industry. This is seen as necessary in order to drive and improve the supporting policies of the financial institutions.

[77]State Council, 2013. *Several Opinions of the State Council on Promoting the Healthy Development of the Photovoltaic Industry.* [online] Available at: http://www.dgsolarpower.com/new_206.html[date of visit: 3 2014].

The Opinions on Supporting Financial Services to the Distributed Solar PV Energy Generation[78] jointly issued by the National Energy Bureau and China Development Bank in August aims to promote the effect of financial leverage to guide the input of social funds and effectively motivate investments in distributed solar PV power generation. It also specifies the "Fiscal support plus Financial tools" investment model. China's distributed solar PV power generation that is still in the initial development period needs to encourage all kinds of investors and establish proper investment and financing systems.

The Air Pollution Prevention and Control Action Plan issued by the State Council in September 2013 proposes setting a cap on total coal use and puts forward concrete measures in 10 articles and 35 paragraphs, many of which concern finance, which has seldom been seen in previous policies. The specific financial measures include "[to] formulate fiscal and financial supporting policies, support the withdrawal or transition of enterprises with excessive capacity in industries of high energy consumption and high pollution; the related departments shall not approve, verify, register projects that have not passed energy evaluation and Environmental Impact Assessment, and financial institutions shall not provide any forms of new credit support to them." It is obvious to see from the Action Plan that the government has attached great importance to the governance of environmental problems via financial means. In terms of the source of financial support, the shift from the original support from public sector to the introduction of capital from commercial sectors such as private financial institutions will be an important transformation. Government funds are far from sufficient, as it is clear in the solar photovoltaic power and wind power sectors. Government support only accounts for a small part of the investment, but this small part plays an important guiding role. 75% of the solar photovoltaic power and wind power financing comes from private financing such as bank loans[79]. The guidance and motivation provided by public financing works in combination with financing leveraged from commercial financial institutions will be the main mode of development of China's green industries.

In November 2013, nine ministries including the National Development and Reform Commission and the Ministry of Finance jointly formulated the first National Strategy for Adaptation to Climate Change[80]. Through this strategy they proposed to "Strengthen fiscal and tax support and financial policy support as key safeguard measures to combat climate change" and emphasized that

[78]Polaris Solar PV Network, 2013. *The National Energy Administration and China Development Bank Issued The Opinions on Supporting Financial Services to the Distributed Solar PV Energy Generation.* [online]
Available at: http://guangfu.bjx.com.cn/news/20130917/460251.shtml[date of visit: 3 2014].

[79]Climate Policy Research Center of Tsinghua University. *China Low-Carbon Development Report(2013)* , Beijing: Social Sciences Academic Press.2013

[80] Ibid 33

establishment of the climate financial market should be promoted and the development of climate-related services and products encouraged. In particular, the Government will explore innovative financing methods such as issuing "catastrophe bonds" through market institutions in order to support agriculture, forestry and other fields to develop insurance products. Data shows that the global climate bonds reached 346 billion US dollars in 2013, including the six fields of transportation, energy, finance, construction and industry, agriculture and forestry, and waste and pollution control. Although China has not yet set up special and strictly defined "climate bonds" or "green bonds", it is perceived by some studies as the biggest country of global climate bonds (financial bonds that flow into climate related fields) which total 127 billion US dollars[81]. China must formulate specific policies for climate bonds, which will help enterprises working in fields related to environmental protection to raise funds by directly issuing bonds so as to reduce their financing costs.

4.4.2 Practice of the Financial Institutions in Sustainable Development

The divestment of the financial institutions from the coal industry has become a global trend. In June 2013, in order to promote the transition from fossil fuels to clean energy, the World Bank announced that no loans would be provided to coal-fired power plant projects except under special circumstances[82]. Similar decisions have been made by the US government[83], the Dutch government[84] and the European Bank for Reconstruction and Development (EBRD)[85]. In China, banks formulate strategies in terms of the business risks of investing in the coal industry and have not yet made strategies to divest which are based on climate considerations. In recent years, China's coal industry credit risks have increased due to overcapacity and low market prices. Therefore, Chinese banks have also reduced loans to the industry and have a wait-and-see attitude as to whether or not to divest from the industry at a later date. The Chinese banks should improve their policies for fossil fuel energy financing from the perspective of energy transition and climate responsibilities, not just based on business considerations.

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[81] 21th Century Business Herald, 2013. *China's Climate Financing Reached 2.46 Trillion in 2014.* [online] Availableat:http://finance.eastmoney.com/news/134jjj5,20130820316501628.html[date of visit: 3 2014].

[82]China Energy Network, 2013. *The World Bank Doesn't Support Coal-Fired Power, Triggering Off Heated Discussions of Many Experts.* [online] Available at: http://www.china5e.com/news/news-840604-1.html[date of visit: 3 2014].

[83] VOLCOVICI, V., 2014. *U.S. spending bill aims to dilute curbs on overseas coal financing*. [online] Available at: http://www.reuters.com/article/2014/01/14/usa-fiscal-coal-idUSL2N0KO12420140114[date of visit: 3 2014].

[84] House, W., 2014. *Joint Statement by the United States and the Netherlands on Climate Change and Financing the Transition to Low-Carbon Investments Abroad.* [online] Available at: http://www.whitehouse.gov/the-press-office/2014/03/24/joint-statement-united-states-and-netherlands-climate-change-and-financ [date of visit: 2014].

[85]Alex Roca.2013. *European Development Bank Say No to Coal Financing* [online] Available at:http://www.businessweek.com/news/2013-12-10/ebrd-board-decides-to-scrap-finance-for-most-coal-power-plants[date of visit: 3 2014].

In addition to the Chinese Government's promotion of climate actions through policies and guidelines, the financial institutions also provide funding guarantees for climate actions.

In November 2013, the biennial UNEP FI[86] World Summit on Sustainable Finance was held in Beijing under the theme of "Financing the Future We Want: China, Emerging Markets and the Global Economy". The global financial institutions and stakeholders including governmental regulatory institutions and China-invested financial institutions such as the National Development and Reform Commission, the Ministry of Finance, the People's Bank of China, China Banking Regulatory Commission as well as Chinese NGOs were invited and participated in the discussions. Taking place on the occasion of super typhoon Haiyan's striking of the Philippines and the opening ceremony of the Climate Conference in Warsaw, climate financing and responsibilities were also on the agenda of the conference. Furthermore, as the backbone of China's green finance policies, the implementation of green credit also attracted great interest among participants.

In November 2013, 29 commercial banks, including five state-owned commercial banks, signed common commitments to implement the green credit approach, making a solemn commitment to strengthen the credit management of industries with serious overcapacity and improve their environmental and social performance[87]. However, the domestic financial institutions are still in the initial period in terms of identifying climate risks related to their businesses and still make only limited disclosures of carbon emissions related to their financing and investments. 2013 was the second year of implementing the Green Credit Guidelines[88], which state: "The financial institutions in the banking industry should focus on the damages and related risks that might be caused to the environment and society by their clients and important stakeholders in construction, production and operation activities including related environmental and social problems such as energy consumption, pollution, land use, health, security, resettlement of migrants, ecological protection and climate change." There is still much room for improvement in the implementation of the Guidelines.

4.4.3 Civil Society's Participation in Green Finance

Financial reform is a hot topic in 2013, and the opening up of the financial industry to private capital is a key point of ongoing reforms. Since the State Council issued a document supporting private bank pilot projects in July, numerous companies have announced plans to establish private banks. In

[86] UNEP Finance Initiative

[87] Finance and Investment, 2013. *29 Banks Sign the Common Green Credit Commitments and Promote Solving the Excess Capacity Problem Together.* [online]
Available at: http://finance.ifeng.com/a/20131119/11110642_0.shtml [date of visit: 3 2014].

[88] China Banking Regulatory Commission, 2013. Notice of the CBRC on Issuing the Green Credit Guidelines. [online]
Available at: http://www.cbrc.gov.cn/chinese/home/docView/127DE230BC31468B9329EFB01AF78BD4.html [date of visit: 2014].

November, 15 large coal enterprises including the Shanxi International Energy Group (SIEG), Shanxi Jincheng Anthracite Mining Group Co. Ltd., and Datong Coal Mining Group initiated preparations to establish a "China Coal Bank", using the enterprise's coal reserves as security. This event gained extensive media coverage. If this bank was actually established, the coal enterprises, which are experiencing a period of downturn, would be able to unscrupulously exploit coal stocks in order to gain increased access to financing, worsening air pollution and creating further emissions, adding to existing overcapacity, and creating a vicious cycle of the market seriously harming itself. Foreseeing these consequences, 51 Chinese NGOs including Greenovation Hub and Green Watershed wrote a joint appeal letter to the China Banking Regulatory Commission, calling on the Commission to reject the establishment of China Coal Bank[89]. In the following month, the China Banking Regulatory Commission issued a document requiring local governments and financial institutions to be cautious of credit risks associated with the coal industry[90]

In 2013 Green Watershed also issued a report on the Green Credit Footprints of China's Banking Industry, studying the status of green credit implementation of China's listed banks[91]. G:HUB also issued a report examining the performance of Chinese banks in climate responsibly[92], which illustrated the significant role of the Chinese banking sector in the development of the renewable energy sector. The banking industry plays a key role in addressing climate change, especially in the context of China's energy transition. On the one hand, 70% of China's renewable energy financing comes from bank loans. However, the banks still have much work to do to achieve the non-fossil fuel energy development goals contained in the Twelfth Five-Year-Plan, including those related to information disclosure of carbon emissions caused by climate- and energy-related loans and investments. On the other hand, as China has put "coal control" on the agenda, bank financing for the coal industry has also become the focus of attention. China's banks currently play a dual role of both propping up the fossil fuel industry, but also supporting the growth of China's renewable energy sector. For example, in Shanxi Province, one of the major coal suppliers, over 40% of bank loans are made to the coal industry. At the same time, banks are providing financial leverage to China's energy transition, with 70% of investments in solar PV power and wind power coming from bank loans.

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[89]Greenovation Hub, 2013. *49 Environmental Protection Organizations Wrote a Joint Letter to the China Banking Regulatory Commission, Disapproving the Establishment of China Coal Bank.* [online]Available at: http://www.yicai.com/news/2013/12/3178608.html [date of visit: 3 2014].

[90]Finet, 2014. *【Policies and Regulations】Reports Claim that the China Banking Regulatory Commission Requires the Local Places to Be Alert to Credit Risks in the Coal Industry.* [online] Available at: http://money.163.com/14/0124/13/9JBVN05R00253B0H.html[date of visit: 3 2014].

[91] Philanthropy Times, 2013. *Environmental Protection NGOs Promote Green Credit: Protect the Environment in Another Way.*[online] Available at:http://www.wokeji.com/lvse/zx/201312/t20131211_603358.shtml[date of visit: 32014].

[92] Greenovation Hub.2013. *Facilitating China's Energy Transformation—An Study on the Support of Renewable Energy of the China-Invested Banks.* [online] Available at: www.ghub.org/cfc [date of visit: 32014].

Generally speaking, NGOs are participating extensively in policy analysis and advocacy. However, they are active only on the outskirts of policy making, as the channels for participation are still lacking and the impacts of their participation still need to be improved. Nevertheless, this process requires effort from both parties: the policy makers should be ready to open the door and listen carefully to the voices of civil society, while NGOs must be ready to articulate their concerns and propose constructive inputs for improvement.

5. International Cooperation and Diplomacy

5.1 South-South Cooperation

With the gradual increase in both its economic power and emissions levels, China is bearing greater pressure in international climate negotiations. The Chinese government pledged to undertake South-South cooperation to tackle climate change at the RIO+ 20 Summit in 2012 and planned to spend around 10 million US dollars each year to provide support to its Southern partners. This included energy, water saving, and renewable energy utilization equipment as well as marine meteorological satellite forecasting and warning equipment in order to help African countries, the least development countries and small-island states to actively tackle climate change. By November 2013, China donated over 0.9 million energy-saving lamps, over 10,000 energy-saving air-conditioners and 6,000 sets of household solar power generation systems, through government procurement channels. In addition, China has held 28 seminars in 114 developing countries, trained nearly 800 officials and technical personnel in the field of climate change[93]. But at the present stage, China has not set up dedicated funds for South-South cooperation in tackling climate change, and there are no specific details available on exactly how much funding has been spent and what its impacts have been to date.

Helping the developing countries to improve their capability to mitigate and adapt to climate change represents China's fulfillment of its climate protection responsibilities and corresponds to its growing capabilities. It also allows China to seek a common stance in the climate negotiations with the developing countries. Moreover, following the broader trend of China's "going out" strategy, China should encourage its enterprises to export climate-friendly technologies, products, and equipment to the developing countries, improve investment transparency, and apply strong environment and social standards to its overseas projects. It should also move away from the natural resources-oriented foreign investment strategy [94] and rigorously improve the

[93]Chinagate.2013. *Webcast of the High Level Forum of the South-South Cooperation on Addressing Climate Change* [online] Available at: http://www.china.com.cn/zhibo/2013-11/19/content_30643613.htm?show=t [date of visit: 3 2014].

[94]Greenovation Hub. 2013. Analysis of the Regulation*, Policies and Practice of the Chinese Mining Industry in "Going Out"*. [online] Available at: www.ghub.org/cfc [date of visit: 3 2014].

competitiveness and quality of the Chinese enterprises in "going out" in order to deliver mutual benefits.

5.2 China-US Cooperation on Climate Change

The China-US cooperation on energy and climate change was initiated at the end of the 1970s. In the past three decades, China and the US have signed nearly 40 bilateral cooperation agreements in the fields of energy and climate change. On April 13, 2013, when the new US Secretary of State John Kerry visited China, both sides signed and published the U.S.-China Joint Statement on Climate Change, announcing that the two countries would establish a climate change working group under the framework of the U.S.-China Strategic and Economic Dialogue. The teams were led by Xie Zhenhua, Vice Chairman of the NDRC and Todd D. Stern, United States Special Envoy for Climate Change. From July 10 to July 11, 2013, senior officials of the two governments carried out the fifth U.S.-China Strategic and Economic Dialogue[95]. The highlight of this dialogue was the Report of the U.S.-China Climate Change Working Group. The two countries agreed to carry out cooperation in five key fields, including emission reduction from heavy duty and other vehicles, smart grids, carbon capture utilization and storage, collecting and managing greenhouse gas emission data, and energy efficiency in buildings and industry, and agreed to promote further specified action plans[96].

In 2013, the new U.S. and Chinese leadership attached more importance to energy saving, emission reduction and addressing climate change on their domestic agenda. This cooperation meets the strategic interests of both sides, and the consensus of the two countries to cooperate on climate action is worthy of recognition. The five fields involved also provide opportunities for investment and trade development between the two countries in the future. However, the cooperation potential of the two countries in the field of climate change still needs further exploration in terms of the key sectors and players involved. In future, the U.S.-China cooperation on climate action should move forward both bilateral and multilateral cooperation[97], strengthen the efforts and improve the effectiveness across different sectors and levels, and should include representatives of the governments, enterprises, non-governmental organizations and other concerned stakeholders.

5.3 Other International Processes and Prospects for 2014

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[95]Xinhua Net, 2013. *Explanations on the Joint Results of the Fifth-Round Economic Dialog under the U.S.-China Strategic and Economic Dialog Framework (full text).* [online] Available at: http://news.xinhuanet.com/world/2013-07/13/c_116523398.htm [date of visit: 22 3 2014].

[96]Greenovation Hub, 2013. *U.S.-China Cooperation on Climate Change, Start from Green Building.* [online] Available at: http://www.ghub.org/?p=1387[date of visit: 23 3 2014].

[97]Wu Yuzhen, 2013. *The key to the U.S.-China Cooperation on Climate Change Is "Pragmatism".* [online] Available at: http://roll.sohu.com/20130612/n378618366.shtml [date of visit: 23 3 2014]

China's environment experienced dramatic twists and turns in 2013. Meanwhile, uncertainties still remain regards to the direction of China's environment and climate policies in 2014, and the international processes related to climate change will continue to heat up in 2014.

Following the publication of the Intergovernmental Panel on Climate Change (IPCC) Working Group I Contribution (on climate science) to the fifth Assessment Report, the Working Group II Contribution to the Assessment Report was also published in March 2014. Working Group II assessed the risk of climate change in terms of the physical impacts of climate change as well as populations' exposure and vulnerability to climate change. The four key messages are as follows: The climate risks are real, wide-reaching and varied from place to place; uncertainty is no reason to delay actions; poor and marginalised communities will be hit hardest, and; no single adaptation solution fits all. The final part of the IPCC report – from Working Group III – which deals with the topic of mitigation, was just completed in early April 2014. The final reports and a synthesized summery for policy makers are due this October. As the most comprehensive climate science report, the IPCC report is the main basis for international climate negotiations as well as an important basis for the formulation of climate change policies of many countries. The process of the IPCC is innately related to the progress of the United Nations climate negotiations.

The 2014 APEC Informal Leaders' Summit will be held in the suburbs of Beijing in autumn. This is the second time for China to host the APEC Summit since 2002 under the theme "Shaping the Future through Asia-Pacific Partnership". The meeting will not only discuss economic issues but will also cover topics related to energy, safety and environmental, especially the issue of developing energy sources while maintaining the environment's sustainable carrying capacity. Beijing should make use of its diplomacy power and the progress of its domestic policies to promote in-depth conversations between APEC nations and facilitate the APEC summit to reach some joint commitments and effective measures to address environmental problems and climate change.

The United Nations Conference on Sustainable Development (Rio + 20 Summit) in June 2012 set up the Open Working Group (OWG) on Sustainable Development Goals (SDGs). Since then, this Working Group has carried out a series of discussions on SDGs and put forward suggestions for 19 thematic areas that can be used to determine the SDGs. This was submitted to the Secretary-General on February 21, 2014. These 19 areas include poverty elimination, food safety and nutrition, health and population dynamics, education, gender balance and women cultivation, water and hygiene, energy, economic growth, industrialization, infrastructure construction, creation of job opportunities for all, promotion of equality, sustainable cities and human settlements, sustainable consumption and production, climate, marine resources, ecological environment and biodiversity,

implementation, social peace and non-violent society[98]. Climate change plays an important and leading role in the sustainable development goal scheme, and is not only of long-term strategic significance but also an urgent concern which must be addressed[99]. From September 2014 to September 2015, the United Nations will initiate inter-governmental discussions and negotiations based on the suggestions of all Parties in order to reach a consensus and pass the agenda at the Heads of States Summit in September 2015[100]. This process is closely related to the new climate change agreements in terms of both implications and timetable – so synergies should be explored.

6. The World is Expecting Leadership from China

From 2013 onwards, some powers including the United States and the EU have made continuous efforts with regards to both their domestic climate actions and the international climate diplomacy. These actors have attempted to promote multilateral climate change cooperation within the limited time of less than 2 years, and hope to reach a new deal that meets the satisfaction of all countries in 2015. For example, the United States' series of actions at the beginning of this year, including putting forward the framework for the future climate agreement and the subsequent series of diplomatic activities, attest to its intention to rebuild international leadership and to maximize its national interests. The United States' climate negation strategy benefits from the constantly declining domestic carbon emissions and relies on the devotion of political and diplomatic efforts of the Obama administration to build the international climate regime. It is foreseeable that China will receive pressure from various directions, including the United States, the EU and developing countries (the Alliance of Small Island States and the Least Developed Countries etc.) in the negotiation on the 2015 new agreement.

Facing the urgency of addressing climate change, China is taking active domestic actions. At the National People's Congress and Chinese People's Political Consultative Conference (the so-called "Two Sessions") held in March of 2014, the Report on the Work of the Government delivered by Premier Li Keqiang pointed out that "we should declare a war against pollution such as the smog just as resolutely as we have done against poverty". China's ambitious development of renewable energy, discussions on the control of total coal consumption, promotion of carbon pricing, strengthening of South-South cooperation on climate change, and low-carbon city pilot projects

[98] Permanent representative of the People's Republic of China to the Food and Agriculture Organization, 2014. *FAO Bulletin on the Work Situation of the Food and Agriculture Organizations in Participation in the Post-2015 U.N. Development Agenda.* [online] Available at: http://www.cnafun.moa.gov.cn/kx/gj/201403/t20140307_3806573.html [date of visit: 26 3 2014].

[99] China Social Science Network , 2014. *Establishment of Climate Change and Sustainable Development Objectives.* [online] Available at: http://www.cssn.cn/jjx/jjx_dt/201402/t20140212_961918.shtml [date of visit: 3 2014].

[100] Ibid 91

should all become the new pivot and impetus in China's domestic climate policies and international diplomatic efforts around climate issues.

At the same time, China needs to better coordinate its international and domestic climate strategies and practical work. Based on a comprehensive analysis, China should put forward its own proposals for the main elements of the new climate agreement in 2015 (covering emission reduction, adaptation, finance, etc.) These proposals must be concrete and actionable. Given the pollution control, energy saving and emission reduction practices that are being actively carried out at present, China should also re-evaluate its emission reduction targets by 2020. For example, it could consider integrating stronger carbon intensity reduction targets which are at the higher end of the current pledge, aim for a higher percentage of renewable energy in the country's energy mix, and seek to control total coal use, in order to gain a better position in the lead up to Paris.

The integration of the above steps into the package of China's enhanced actions can actively drive the negotiation progress and serve as a proactive and powerful tactic in the negotiations before 2020 and will help to shape the new agreement. It will dilute the pressure on China, and put the country in a better position to influence the evolution of the negotiation process and win the support of more developing countries. In 2014, with the Twelfth Five-Year Plan entering the latter half of its implementation, and the public paying increasing attention to issues such as environmental pollution control and anti-corruption measures, the Chinese leadership should have the courage and wisdom to live up to the expectations. It is crucial that the government respond to the social and environmental challenges and pave the road ahead for the reform process. At the same time, the government should display increase political ambition to promote the shift to a more effective energy and economic model, and follow through with the necessary in-depth investigations and research in order to support the development of new and ambitious carbon reduction targets for the coming Thirteenth Five-Year Plan.

Civil society dialogue and multi-stakeholder engagement should also become a new feature and integral part of China's domestic and diplomatic efforts. This can help to catalyze positive messages among the public, promote a better understanding of China around the world, and expand cooperation in an open and sustainable manner. This will help China to be able to adopt more proactive and ambitious strategies and display the real leadership expected of a great nation in the climate process and other international processes. As Li Keqiang pointed out at the government work conference on energy saving, emission reduction and addressing climate change in March: "Addressing climate change is in synergy with energy saving and emission reduction, and is the common responsibility of humanity. As a responsible big country, China is willing to take actions and make greater efforts to address the challenges of climate change with all the other countries in

the world by adhering to the common but differentiated responsibility principle, the principle of equity and respective capabilities."

China is now talking seriously about addressing both domestic environmental concerns and international climate issues. The country has come a long way since the days when the economy was reliant almost exclusively on high emitting industries. As China's political system evolves and the economy develops, so does its society, and the Chinese people are increasingly demanding greater protections for their environment. The Chinese people and the world are now waiting to see if China's ambitious environment goals will be achieved and sustained in the years to come.

Appendix 1

Summary of Policies and Measures Related to Solar Photovoltaic Power in 2013

(Source: summarized based on online information)

Date	Policy	Authority of Publication
March 1	Opinions of Connecting Distributed Power to Grid	National Grid
June 16	Work Plan of Distributed Solar PV Power Generation Demonstration Zones	National Energy Administration
July 15	Several Opinions of the State Council on Promoting the Healthy Development of the Photovoltaic Industry	State Council
July 18	Interim Measures for Distributed Power Generation Management	National Development and Reform Commission
July 24	Notice on Related Issued of the Implementation of Subsidy per kWh Policy for Distributed Solar PV Power Generation	Ministry of Finance
August 9	Notice on Building Distributed Solar PV Power Generation Application Demonstration Zones	National Energy Administration
August 26	Notice on Promoting the Healthy Development of the Solar PV Industry Through Pricing Leverage	National Development and Reform Commission
August 30	Notice on Related Matters of Adjusting Renewable Energy Generated Electricity Price Additional Standards and Environmental-friendly Power Price	National Development and Reform Commission
August 22	Opinions on Supporting Financial Services to Distributed Solar PV Power Generation	National Energy Administration, China Development Bank
September 24	Interim Measures for Solar PV Power Plant Projects Management	National Energy Administration
September 29	Notice on the Policy of Value Added Tax of Photovoltaic Power Generation	Ministry of Finance
September 17	Standard Conditions for Photovoltaic Manufacturing	Ministry of Industry

	Industry	and Information Technology
October 11	Interim Measures for Solar PV Manufacturing Industry Standard Announcement Management	Ministry of Industry and Information Technology
October 29	Letter of Seeking Opinions on 2013 and 2014 Photovoltaic Power Generation Construction Volume	National Energy Administration
November 18	Notice on Distributing Interim Measure for Distributed Photovoltaic Power Generation Projects Management	National Energy Administration
November 19	Notice on Related Issues of Exempting of Distributed Photovoltaic Power Generation for Self-Consumption from Government Funds	Ministry of Finance

Appendix 2

Subsidy to Solar PV Power Station by Region

(Source: Summarized based on online information)

Region	Subsidy Category	Subsidy Standard	Notes
Nationwide	All	0.42yuan/kWh	
Zhejiang Province	All	0.52yuan/kWh	Including state subsidy and provincial subsidy
Wenzhou, Zhejiang Province	Commercial Power Station	0.62~0.72yuan/kWh	Including state subsidy, provincial subsidy and city subsidy
	Household Power Station	0.82yuan/kWh	Including state subsidy, provincial subsidy and city subsidy
Tongxiang, Zhejiang Province	First two years after construction	2.32yuan/kWh	Including state subsidy, provincial subsidy, first installation subsidy and city subsidy
	Third year to fifth year after construction	0.72yuan/kWh	Including state subsidy, provincial subsidy and city subsidy
Jiaxing, Zhejiang Province	2013	2.8yuan/kWh	Including state subsidy and provincial subsidy，other subsidy sums not specified, subsidy is given only for 3 years
	2014	2.75yuan/kWh	
	2015	2.7yuan/kWh	
Hefei, Anhui Province	Household Power Station	2.67yuan/kWh	Including state subsidy, first installation subsidy and city subsidy
Jiangxi Province	First-phase project	0.42yuan/kWh+ 4yuan/Wp	Including state subsidy and first installation subsidy
	Second-phase project	0.42yuan/kWh+ 3yuan/Wp	Including state subsidy and first installation subsidy

G:HUB Climate and Finance Policy Center

G:HUB promotes the development and implementation of sound climate and financial policies, and encourages critical dialogue among stakeholders. The Center seeks positive changes in climate and sustainable finance via high-quality research and analysis.

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